ELECTRONICALLY FILED 05/30/2023 16:10:39 OFFICE OF ADMINISTRATIVE HEARINGS

BEFORE THE OFFICE OF ADMINISTRATIVE HEARINGS

STATE OF KANSAS

IN THE MATTER OF

THE APPLICATION OF THE CITIES OF HAYS, KANSAS AND RUSSELL, KANSAS FOR APPROVAL TO TRANSFER WATER FROM EDWARDS COUNTY, KANSAS PURSUANT TO THE KANSAS WATER TRANSFER ACT.	)	**OAH NO. 23AG0003 AG**

Pursuant to K.S.A. Chapter 77.

DIRECT TESTIMONY OF PAUL McCORMICK, P.E., SENIOR ASSOCIATE GEOLOGICAL ENGINEER, BURNS & McDONNELL ENGINEERING COMPANY, INC.

ON BEHALF OF

THE CITIES OF HAYS AND RUSSELL, KANSAS

RELATING TO

WELLFIELD YIELD FOR THE CITIES OF

HAYS AND RUSSELL, KANSAS

Q. Please state your name and present position.

A. My name is Paul A. McCormick, P.E. I am a Senior Associate Geological Engineer with Burns & McDonnell Engineering Company, Inc., an international design and consulting engineering firm based in Kansas City, Missouri.

Q. On whose behalf are you submitting testimony?

A. The City of Hays, Kansas and the City of Russell, Kansas (the "Cities").

Q. Please describe your educational background and employment experience.

A. I have a Bachelor of Science degree in Geological Engineering from Missouri University of Science & Technology, and am a licensed Professional Engineer in Kansas, Missouri, Iowa, Nebraska and South Dakota. I have worked in the groundwater industry for 29 years providing design and consulting services for clients regarding hydrogeology, groundwater modeling, and water well and wellfield design for water supply purposes. My CV is attached as Exhibit PM-01 and incorporated as if set forth in full in this document.

Q. Has this direct testimony been prepared by you or under your direct supervision?

A. Yes, it has.

Q. Have you previously testified before the Kansas Department of Agriculture–Division of Water Resources or any other regulatory commission?

A. I have testified before the KDA-DWR a single time on behalf of the City of Wichita in Case No. 18 WATER 14014.

Q. Have you testified in any litigation in the prior four years?

A. No, I have not.

Q. Are you sponsoring any exhibits with your direct testimony?

A. Yes. I Sponsor Exhibit PM-02, which is my expert report titled "Wellfield Yield for the City of Hays," and which is incorporated into my testimony as if set forth in full.

Q. What is the purpose of your direct testimony?

A. My opinions are set forth in detail in my expert report, but in general, my testimony relates to the maximum yield available from the Cities' existing water sources in the event of 2-year (moderate), 5-year (exceptional), 10-year (decadal), and 20-year (multidecadal) droughts.

Q. How is your testimony organized?

A. My report begins with a general discussion of Hays's existing water supplies and the susceptibility of those supplies to drought conditions over 2-, 5-, 10-, and 20-year durations. I then detail each of the City's water sources, including observed water-level trends, tracking and modeling tools, and the respective vulnerability of each source to drought scenarios. I then summarize my findings relating to the sustainable yield of each source under each drought scenario. Finally, I provide my analysis of Russell's wellfield yield under drought conditions.

Q. In summary, what did you conclude?

A. Currently, Hays obtains water from three wellfield sources: (1) a wellfield in the Big Creek alluvial aquifer permitted for a maximum of 1,429.46 acre-feet per year; (2) a wellfield in the Smoky Hill River alluvial aquifer permitted for a maximum of 2,285 acre-feet per year; and (3) A wellfield in the Dakota groundwater aquifer permitted for a maximum of 882 acre-feet per year. The maximum permitted yield of these existing resources is subject to the physical limitations of each aquifer and water rights limitations to both annual volumes extracted and a maximum permitted instantaneous rate of the City's water appropriation rights. For example, the Hays' Dakota wellfield can sustainably provide no more than 120 acre-feet per year, regardless of precipitation conditions, despite having "paper" rights of up to 882 acre-feet per year. Periods of drought reduce the annual sustainable volume available from the City's other existing sources such that drought yields can be drastically less than the authorized quantities.

The estimated yield of Hays's existing wellfields under the four above-referenced drought scenarios are summarized in Tables 1 and 2, below. In the event of a longer drought than is

projected in these calculations, it is my opinion that water levels in the aquifer and the City's ability to produce water will continue to decline.

TABLE 1:

Estimated Wellfield Yield During 2-Year (Moderate) to 5-Year (Exceptional) Drought Conditions:

Wellfield Name	Permitted Water Rights (acre-feet per year)	2-Year (Moderate) Drought Sustainable Yield (acre-feet per year)	5-Year (Exceptional) Drought Sustainable Yield (acre-feet per year)
Big Creek	1,429.46	1,429.46	1,040
Dakota	882	120	120
Smoky Hill	2,285	1,000	600
Total	3,675*	2,549.46	1,760

**Permitted water rights total is limited by permit conditions.*

TABLE 2:

Estimated Wellfield Yield During Decadal and Multidecadal Drought Conditions

Wellfield Name	Permitted Water Rights (acre-feet per year)	Decadal Drought Sustainable Yield (acre-feet per year)	Multidecadal Drought Sustainable Yield (acre-feet per year)
Big Creek	1,429.46	620	360
Dakota	882	120	120
Smoky Hill	2,285	100	0
Total	3,675*	840	480

**Permitted water rights total is limited by permit conditions.*

Relating to the City of Russell: it has 1,842 acre-feet per year of permitted water rights, obtained from a surface water intake on Big Creek and from wells located in the Pfeifer Wellfield located in the Smoky Hill River alluvial aquifer. It is not uncommon for the flow in Big Creek to be low enough to restrict the usage of the surface water intake, which eliminates that water source during times of drought, rendering it unusable and leaving Russell entirely dependent on the Pfeifer Wellfield in the Smoky Hill River alluvium, which is downstream from and otherwise very similar to the Hays's Smoky Hill River Wellfield with respect to water-levels during drought. Because

Russell's Pfeifer Wellfield is downstream from Hays's Smoky Hill River Wellfield, flows must make it past Hays's wellfield before they are available to recharge Russell's wellfield. Once flow stops in the Smoky Hill river, water levels in Russell's Pfeifer Wellfield decline steadily.

Finally, though my report is primarily focused on available water quantity, it should be noted that the rate that water can be physically pumped from the Cities' existing sources will also be reduced during periods of drought.

Q. Please describe how you arrived at your conclusions.

A. As explained in more detail in my expert report, the Cities' current sources of water are dependent on precipitation and river flows for recharge (except for Hays's Dakota wellfield, which is in a confined portion of the Dakota aquifer and receives very little recharge from infiltration). I used standard analytical methods commonly relied upon by professional engineers in my field to evaluate how the Cities' water sources will decline over time during drought, so the available yield depends upon the duration of the drought event.

For the Big Creek wellfield, I relied on the Aquifer Health Index ("AHI") report, which documents development of a resource-management tool used by the City that tracks the condition of the aquifer. Based on the AHI water level data, I estimated the available yield from the wellfield by extrapolating the observed average water table declines across the wellfield over the stated drought duration periods, considering the known physical characteristics of the bedrock geology of the Big Creek aquifer.

A very similar analysis was used for Hays's Smoky Hill River Wellfield, for which water levels are known to decrease linearly over time when there is reduced flow in the river per information from USGS monitoring wells over periods of previous drought and as illustrated in my report via reports generated from those monitoring wells' reported water levels.

1 As noted above, historical pumping records indicate that the Dakota Wellfield can
2 sustainably pump no more than 120 acre-feet per year. Because the wellfield is highly confined,
3 no modifications were made to the available yield during the various drought scenarios.

4 **Q. Does that conclude your direct testimony?**

5 A. Yes, the balance of my testimony is included in my report.

VERIFICATION

STATE OF Missouri)
)
COUNTY OF Jackson)

I Paul A. McCormick, being duly sworn, on oath state that I have read the foregoing and know the contents thereof, and that the facts set forth therein are true and correct to the best of my knowledge and belief.

PAUL A. McCORMICK
LICENSED
16559
5/24/23
KANSAS
PROFESSIONAL ENGINEER

By: _____
Paul A. McCormick, P.E.

The foregoing was subscribed and sworn to before me this 24 day of May, 2023.

_____
Notary Public

My Commission Expires:

3-14-24

ANGIE YELTON
NOTARY PUBLIC-NOTARY SEAL
STATE OF MISSOURI
JACKSON COUNTY
MY COMMISSION EXPIRES 3/14/2024
COMMISSION # 12381302

PAUL A. MCCORMICK, PE

Senior Associate Geological Engineer

Paul has more than 29 years of experience involving all aspects of hydrogeologic investigations and well design for water supply purposes. His leadership, project management and technical capabilities are a significant factor in the success of projects.

Paul has extensive experience in hydrogeologic investigations, water supply studies and numerical groundwater modeling. He has designed and overseen construction of multiple wells and wellfields throughout the world for municipal, industrial, and private concerns. His work includes providing technical expertise and guidance to develop well fields ranging in size from 2.0 to 125 MGD utilizing vertical well, radial collector well, and aquifer storage and recovery technologies. He has developed and utilized groundwater models for evaluation of groundwater flow, mass-transport in groundwater systems, contaminant migration, and remediation of groundwater contamination in varying hydrogeological environments. Paul has authored and co-authored presentations on the various hydrogeological subjects and served as an expert witness regarding groundwater issues and modeling.

EDUCATION

- BS, Geological Engineering

REGISTRATIONS

- Professional Engineer: (MO, KS, IA, SD, NE)

16 YEARS WITH BURNS & MCDONNELL

29 YEARS OF EXPERIENCE

SPECIFIC PROJECT EXPERIENCE

McPherson BPU, Kansas, New Well Field and Groundwater Model

McPherson, Kansas | 2016

Due to declining water levels within their existing well field, BPU required the development of a supplemental source of supply in order to meet projected future water use. Burns and McDonnell provided planning and evaluation for the development of an alternate water supply source for the McPherson BPU. Sources evaluated included both surface water and groundwater. The project includes preliminary design of the well field, approximately 20 miles of raw water pipeline and a new water treatment facility. Groundwater modeling and new water right applications are included in the project. Paul assisted in the development of a groundwater and solute transport model that simulated the impact of a new well on water levels in the aquifer and also evaluated the fate and transport of a chloride plume that is located several miles from the new well field property. The model was also used to support the water right applications needed for the new well field. The model was reviewed by the Kansas Division of Water Resources and the Groundwater Management District No.2.

Water Supply Development, City of Clinton

Clinton, Oklahoma, 2015

Paul is the senior hydrogeologist and engineer for the development of a groundwater supply for the City of Clinton. The City's surface water sources are drying up due to prolonged drought, and a groundwater supply is being developed to replace them. The project includes a minimum of five alluvial wells, raw water distribution, and a 4.0 MGD reverse osmosis treatment plant. Paul is the lead hydrogeologist for the design and construction of the water supply wells and the deep injection well for RO reject disposal. This deep injection well will be the first well in the state of Oklahoma specifically permitted for injection of non-hazardous municipal waste.

EXHIBIT
PM-01

PAUL A. MCCORMICK, PE

(continued)

Collector Well Preliminary Design, Florida Power & Light

Miami, Florida, 2013

To satisfy the increasing power demand in the area, FPL is undertaking the addition of two additional nuclear reactor units to a generating station. A backup cooling water supply is required, and in this location will be provided through the construction of collector wells. Paul was the lead hydrogeologist and groundwater flow modeler developing the design for the collector wells and well field. This required conducting extensive groundwater modeling to evaluate the aquifer response and yield in a challenging geologic environment. Regulatory requirements for permitting the wells were stringent, with oversight from numerous federal and state agencies including the Nuclear Regulating Commission, Fish and Wildlife Administration, Environmental Protection Agency, and numerous interested public entities. Through his modeling efforts Paul was able to optimize the collector well design and reduce the required number of wells from four down to two. This design minimized the costs to FPL, while meeting the very strict regulatory requirements. At 62.5 million gallons per day each, these will be the largest collector wells in the world, as well as the first collector wells constructed in a hard rock environment.

Collector Well Siting Study, Ameren UE

Near Mokane, Missouri, 2008

Paul was a project engineer for a hydrogeologic investigation that was completed to determine the suitability of the Missouri River alluvial aquifer as a groundwater source for a nuclear power plant's required capacity of 50,000 gallons per minute. The hydrogeologic investigation was designed to evaluate the aquifer and determine suitability and locations for appropriate sites for construction of horizontal collector wells.

City of Hays, Kansas, Water Supply Management

Hays, Kansas | 2012 - Present

City of Hays maintains three well fields for raw water supply, the Big Creek alluvial well field, the Smoky Hill River alluvial well field, and the Dakota bedrock well field. The vulnerability of these well fields to drought has fostered a culture of water scarcity that has limited Hays opportunities for economic development and growth. Paul is project manager and lead hydrogeologist/engineer for the development of a groundwater supply at the R9 Ranch, located 66 miles south of the City. The R9 Ranch well field will provide an additional groundwater supply to supplement the City's existing water portfolio and reduce their drought vulnerability. This project will be the first inter-basin transfer of water in the State of Kansas, and as such is undergoing extensive regulatory and public scrutiny. Paul is the lead groundwater flow modeler for the City. MODFLOW2000, a three-dimensional groundwater analysis package developed by the United States Geological Survey is being utilized to evaluate the changes to the water rights of the new well field, determine the sustainable yield of the aquifer, and evaluate the effects on surrounding well owners. Preliminary design of the well field of the well field includes 12 to 14 groundwater wells, 66 miles of pipeline, and associated pump stations and storage tanks.

Well Field Optimization & Improvement Study, Industrial Client

Borger, Texas, 2015

Paul was the project manager, hydrogeologist and engineer for a water supply improvement study for an industrial client requiring approximately 10 million gallons per day of raw water supply. The water is supplied from 26 wells in 3 well fields. The study evaluated well conditions, operation & maintenance practices, aquifer yield, and permitting issues. Recommendations included changes to operations and maintenance practices, well replacement scheduling, and optimization of future well design to maximize yield and sustainability. Work is ongoing and includes design of multiple replacement wells and associated infrastructure.

PAUL A. MCCORMICK, PE

(continued)

Aquifer Restoration, Union County Water Conservation Board

El Dorado, Arkansas, 2007 - Present

Paul provides project management and groundwater expertise to the UCWCB. Union County, Arkansas has been dependent on the Sparta aquifer for municipal, industrial, and agricultural water supplies. Groundwater withdrawals from the aquifer have resulted in a large cone of depression centered beneath the City of El Dorado. Continued increases in the withdrawal rate from the aquifer will likely result in continued expansion of the cone of depression, increased drilling and pumping costs for wells, decreased aquifer yield, and reduced water quality. The Union County Water Conservation Board has as its goal to restore water levels to the top of the Sparta Formation. Groundwater modeling by Burns & McDonnell provided information to allow the UCWCB to determine the level of conservation and rate of recovery necessary for implementation of a water conservation plan based on costs and resulting benefits. Aquifer management practices and artificial recharge has resulted in groundwater levels in the vicinity of El Dorado to recover approximately 115 feet since the start of the project.

Water Reuse Evaluation, City of Garden City

Garden City, Kansas 2022

Paul assisted in concept development, groundwater modeling, regulatory coordination, and system design and evaluation for the Dodge City water reuse evaluation. As a part of a feasibility study, our team explored six unique reuse options: direct potable, indirect potable via aquifer storage, irrigation, industrial, livestock watering and constructed wetland. Each alternative has a tangible benefit to the community and by working directly with key stakeholders, we were able to identify the true value of each option in terms of capital cost, operations and maintenance (O&M) cost, extending the longevity of existing potable water sources and regulatory compliance. Key recommendations include industrial reuse, passive recharge of the aquifer and direct recharge of the aquifer.

Wastewater Resuse Evaluation, City of Dodge City

Dodge City, Kansas, 2023

The City currently has zero discharge permit from its existing South Waste Water Treatment Plant (South WWTP) with effluent water currently being used for irrigation. Paul assisted in concept development, groundwater modeling, regulatory coordination, and system design and evaluation. As part of the project, Burns & McDonnell evaluated up to three potential treatment processes for a proposed ASR concept to meet industry best-practices for log removal credits for ASR. The team also led a discussion with KDHE to discuss the selected alternatives and key water quality parameters of interest to develop a consensus with KDHE on the selected concept. The team assembled a budgetary level opinion of probable cost for the selected alternative. The team conducted hydrogeological modeling of the Arkansas River, the Arkansas River Alluvium and the City's groundwater resources to determine the anticipated capture zone and level of recharge to the City's water supply. The team is continuing to work with the City and regulatory agencies to evaluate and apply for grant-funding opportunities and to proceed with modeling and the next steps of design for the proposed concept.

Aquifer Recharge Evaluation, Kansas Corporation Commission

Garden City, Kansas 2007

Declining water levels in western Kansas have caused extensive challenges for groundwater users near Garden City. The KCC undertook a study to evaluate the feasibility of using excess flow in the Arkansas River through existing irrigation ditches to divert the water to areas away from the stream that are suitable for recharging the alluvial and High Plains aquifer. Paul was the hydrogeologist/engineer and lead groundwater modeler for this study. As part of the project a hydrologic assessment of the ditches was conducted to evaluate their capacity and connection to the underlying aquifer. Then extensive

three-dimensional modeling of stream interaction and groundwater flow was conducted to determine the capacity of the ditches to recharge the aquifer.

Groundwater Remediation, City of Mandan

Mandan, North Dakota 2006

Paul assisted in the hydrogeological investigation and evaluation of a historic diesel fuel spill that was estimated to be as much as 4 million gallons. As part of the project, Paul identified well locations and generated well designs for recovery wells that were installed in the middle of a busy downtown municipal setting. Paul also provided hydrogeological evaluation of the aquifer geology to optimize the remediation system design and installation.

Water Supply Well, Ameren UE

Rush Island, Missouri, 2009

Paul was a project engineer for design and construction of two water supply wells for the Rush Island power plant. These vertical wells were deep bedrock wells constructed in a geologic setting with significant water quality and capacity challenges.

Well Field Evaluation, US Army Corps of Engineers

Hays, Kansas, 2013

Paul served as project manager and senior hydrogeologist for a study to evaluate the use of low head dams to artificially recharge the Smoky Hill River Alluvial Well Field for the City of Hays, Kansas. The project included an evaluation of well field yield, storage, water rights, and dam type and construction. The investigation consisted of data review, existing water rights analysis, aquifer storage capacity and use of low head dams to reduce the drought vulnerability of the resource.

Water Supply Well Design, Greenwood Utilities

Greenwood, Mississippi, 2013

Paul served as project hydrogeologist for the design of a vertical well for public water supply. He designed a 1200 gpm water well in a challenging geologic environment. The design was engineered to address issues of high turbidity cause by the aquifer materials.

Evaluation of Supply, Treatment, & Distribution System, Missouri-American Water Company

Parkville, Missouri, 2013

Paul was project engineer for a study concentrated on determining the most financially feasible methods to incrementally increase water supply to meet the demands of a system that has experienced significant residential growth over the past five years. As part of the study the existing well field was evaluated and additional wells sites were explored to determine the most cost effective raw water supply for a new water treatment plant.

Water Supply Well Evaluation, Greenwood Utilities

Greenwood, Mississippi, 2011

Paul served as project hydrogeologist for the evaluation of the design and construction of a water supply well. Highly turbid water was being produced due to problems with the design and construction of the existing well. Paul developed a plan to test

and evaluate the well design, construction, and development to determine the source of the problem and develop a plan to mitigate.

Crystal River Well Field, Progress Energy

Crystal River, Florida, 2011

Paul was the senior hydrogeologist for the addition of six new vertical wells at the Crystal River well field. He was responsible for evaluating the previously completed hydrogeologic study and using the information to design and construct the well field expansion. Six existing wells were also rehabilitated to recover lost capacity. The expanded water supply was used to supply cooling water for electrical power generation.

East Chiller Water Supply Well, TECO

Houston, Texas, 2010

Paul was the design engineer for what was to be a 1500 gpm water well to supply chiller water for a hospital complex in Texas. During his evaluation of the hydrogeology Paul was able to design and implement changes that resulted in the well producing 2000 gpm.

Combined License Application, Ameren UE

Near Mokane, Missouri, 2010

Paul was a senior hydrogeologist on a study to support the COLA application for a nuclear power plant. His role was peer review of the evaluation of the regional and site specific hydrogeology for construction of two new reactor units.

Chloride Migration Evaluation, Kansas Corporation Commission

Burrton, Kansas 2009

Historic oil field brine contamination has resulted in significant levels of chloride in the Equus Beds aquifer near Burrton. This contamination is migrating to the east, and impacting surrounding groundwater users. The KCC was investigating the extent and spread of the contaminant plumes. Paul was the hydrogeologist/engineer and lead groundwater modeler tasked with evaluating the existing data, utilizing a MODFLOW groundwater model to determine the aquifer flow conditions, and conduction transport modeling to evaluate the migration of chloride through the subsurface.

Bentley Wellfield Rehabilitiation, City of Wichita

Wichita, Kansas, 2009

Paul served as the senior hydrogeologist and engineer for wellfield design, construction and testing of water supply wells of a supplemental wellfield in Wichita, Kansas. The Bentley Well Field Project was undertaken as part of the City of Wichita's Integrated Water Supply Plan to develop a wellfield utilizing induced infiltration through the river bank alluvium of the Arkansas River. Paul's responsibilities included well and wellfield design, field inspection, supervision of testing, regulatory contact and coordination, and final design reporting.

Water Supply Well No. 17, City of Junction City

Junction City, Kansas, 2008

Paul served as project hydrogeologist for a for design and construction of a new vertical well for the City of Junction City, Kansas. Well design, construction, performance testing and completion were assessed as part of the project.

PAUL A. MCCORMICK, PE

(continued)

Aquifer Recharge Evaluation, Kansas Corporation Commission

Garden City, Kansas 2007

Declining water levels in western Kansas have caused extensive challenges for groundwater users near Garden City. The KCC undertook a study to evaluate the feasibility of using excess flow in the Arkansas River through existing irrigation ditches to divert the water to areas away from the stream that are suitable for recharging the alluvial and High Plains aquifer. Paul was the hydrogeologist/engineer and lead groundwater modeler for this study. As part of the project a hydrologic assessment of the ditches was conducted to evaluate their capacity and connection to the underlying aquifer. Then extensive three-dimensional modeling of stream interaction and groundwater flow was conducted to determine the capacity of the ditches to recharge the aquifer.

Aquifer Evaluation, City of Sioux Falls

Sioux Falls, South Dakota, 2005

Paul was the project manager of a water supply study to investigate the available yield from the Wall Lake aquifer. The study was designed to determine the quantity and quality of groundwater immediately available from the aquifer as well as to evaluate the long-term effects of pumping on the aquifer water levels.

Wellfield Evaluation, City of Decatur

Decatur, Illinois 1998

Paul was the project manager for an extensive study to determine the potential for development of a wellfield in an alluvial aquifer to provide a groundwater supply for the City of Decatur. The study included a 30-day duration pumping test with eight wells pumping 15 million gallons per day and a MODFLOW three-dimensional model to determine capacity and optimize wellfield operation.

Well Evaluation, Georgia-Pacific Company

Brunswick, Georgia, 1996

Project manager for an aquifer study to identify zones of high chlorides. A large industrial client's well was high in chlorides, causing processing problems. The well was logged using borehole geophysical methods and tested for water yield and quality. An aquifer zone was identified as contributing the chloride. This zone was plugged off, reducing chloride concentrations in the well water to below Drinking Water Standards and increasing the capacity of the well.

Collector Well Rehabilitation, City of Parkersburg

Parkersburg, West Virginia, 1996

Project engineer testing and rehabilitation of two of the city's collector wells in the Ohio River alluvium. Study included long-term pumping tests, visual inspection of caissons and laterals, and recommendation and verification of rehabilitation methods.

Platte West Wellfield, Municipal Utilities District

Omaha, Nebraska, 1995

Project engineer for development of the Platte West Wellfield in the Platte River alluvial aquifer for the city. Development included installation of 12 large diameter, high capacity wells and a MODFLOW three-dimensional model of the aquifer optimize operation of the wells and to maximize yield.

PAUL A. MCCORMICK, PE

(continued)

Groundwater Freeze Barrier, Echo Bay Minerals

Timmins, Ontario, Canada, 1997

Paul relocated to Canada for five months as project engineer for construction of a groundwater freeze barrier system in a glacial till environment. He coordinated and managed the installation of the dewatering wells inside the freeze barrier, installation of the freeze wells, construction of roadways and site grading; supervised subcontractors and drilling crews; performed borehole logging activities, geotechnical surveys, quality control, and surveying duties.

Well Testing & Aquifer Evaluation, Seagram's

Torreon, Mexico 1996

In central Mexico, Paul was the project engineer for a hydrogeologic investigation to determine the yield of a well for a major industrial client. Water quality and yield testing was performed, as well as an interviewing government personnel and reviewing data collected by Mexican governmental agencies.

Fracture Trace Analysis, City of Alburtis

Alburtis, Pennsylvania 1998

Paul was the project engineer for a hydrogeologic investigation to identify sites for future municipal wells. The study utilized fracture trace analysis methods, as well as geologic and hydrogeologic data. A contaminant source survey was also performed that consisted of a review of federal and state databases to verify that there were no environmental concerns for the proposed sites.

Fracture Trace Analysis, Muskego School District

Muskego, Wisconsin 1998

Paul was the project engineer on a hydrogeologic investigation to identify sites for water supply wells for a public school system. The study utilized fracture trace analysis methods, as well as geologic and hydrogeologic data. A contaminant source survey was also performed that consisted of a review of federal and state databases to verify that there were no environmental concerns for the proposed sites.

DEPOSITIONS AND TESTIMONY

Expert witness before the Kansas Department of Agriculture – Division of Water Resources on behalf of the City of Wichita in Case No. 18 WATER 14014.

PROFESSIONAL SOCIETIES

National Groundwater Association
Past President of Missouri Groundwater Association

March 9, 2023

David Traster
1551 N. Waterfront Parkway,
Suite 100
Wichita, Kansas 67206

Daniel Buller
Foulston Siefkin, LLP
7500 College Boulevard, Suite 1400
Overland Park, KS 66210

Re: Aquifer Yield for the Cities of Hays Memorandum

David and Daniel:

Attached is a copy of the technical memorandum and supporting documentation regarding the sustainable yield of the aquifers used by the City of Hays and Russell for municipal water supply. This memorandum is a summary of the results of multiple studies conducted since 1992 regarding the sustainability of these water sources.

I reviewed each of the reports and found that the analysis was thorough, professional, and in compliance with industry standards. The attached memorandum summarizes those results and provides an accurate basis for determining the volume of source water that is sustainably available to the City of Hays.

Sincerely,
Burns & McDonnell Engineering

Paul A. McCormick, P.E.
Senior Associate Geological Engineer

Attachment

EXHIBIT
PM-02

Memorandum

BURNS McDONNELL

Date: March 9, 2023

To: David Traster - Foulston Siefkin, LLP
Daniel Buller - Foulston Siefkin, LLP

From: Paul McCormick, P.E.

Subject: Wellfield Yield for the City of Hays

David & Daniel –

This memorandum summarizes my opinion as an expert in hydrogeology on the maximum yield available from the City of Hays' existing sources in the event of a 2-year (moderate), 5-year (exceptional), 10-year (decadal), and 20-year (multidecadal) drought. All of my opinions on these matters are presented based on standard industry methods of calculation and are within a reasonable degree of scientific and professional certainty.

Numerous reports over the last 25 years have quantified the potential yield of various groundwater resources available to the City of Hays (City). Currently, the City obtains water from three wellfield sources; the Big Creek, Smoky Hill River (SHRWF), and Dakota Wellfields. The maximum yield of these existing resources is subject to the physical limitations of each aquifer and water rights limitations to both annual volume extracted and a maximum instantaneous rate as administered by the Kansas Division of Water Resources (DWR). Periods of drought reduce the annual sustainable volume available from existing groundwater resources such that drought yields can be drastically less than the DWR authorized amount. This memo is primarily focused on available annual volume, but it should be noted that the rate that groundwater can be physically pumped will also be reduced during periods of drought.

PERMITTED WATER RIGHTS

The total quantity of water available to the City from all three wellfield sources combined is limited by water rights permit conditions to 3,675 AF/y (BMcD, 2013). Individually, Big Creek Wellfield is permitted for 1,429.46 AF/y, the Smoky Hill River Wellfield is permitted for 2,285 AF/y (BMcD, 2004) and the Dakota Wellfield is permitted for 882 AF/y (Hays, 2007).

AQUIFER YIELD

The City's current sources of water are dependent on precipitation and river flows for recharge. The Big Creek Wellfield is recharged by Big Creek and the SHRWF by the Smoky Hill River. In periods of drought, when precipitation is minimal or non-existent, recharge from those sources is extremely limited and the City's available water is reduced. The Dakota wellfield is in the confined portion of the Dakota aquifer, and gets very little recharge from infiltration.

For this evaluation, standard analytical methods were used to do a high-level analysis of the sustainable yield of the wellfields belonging to the City of Hays under drought conditions. The City's water sources decline over time during drought, so the aquifer yield is dependent on the duration of the drought event. For the purposes of this evaluation, four durations will be considered:

1. a 2-year (moderate) drought (similar to the drought experienced from 2011 to 2012),
2. a 5-year (exceptional) drought (comparable to the drought of record from 1952 to 1957 as specified by the Kansas Water Office (KGS, 2013)),
3. a 10-year decadal drought, and
4. a 20-year multidecadal drought.

If a drought extends for a longer duration than these periods, it is reasonable to assume that the water levels in the City's well fields will continue to decline to even lower levels.

Big Creek Wellfield

The Big Creek Wellfield is composed of fifteen wells located along Big Creek, within the City limits, in the Big Creek Alluvial Aquifer. The aquifer is a shallow sand and gravel aquifer overlying a highly variable bedrock surface. Bedrock highs separate the wells, and will reduce flow through the aquifer and to wells once water levels drop below the elevation of the bedrock ridges (BMcD, 2013).

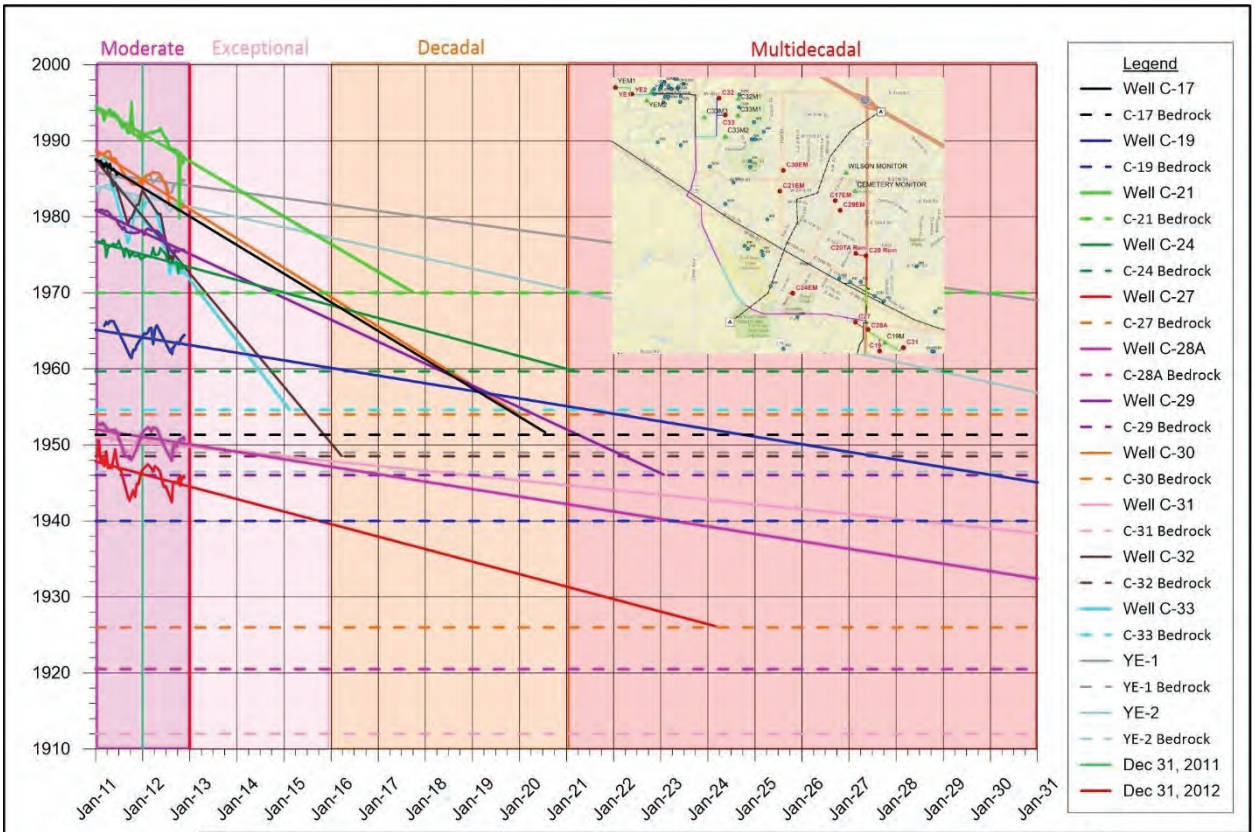
DWR water rights limit the City to a maximum of 1,429.46 AF/y of water from the Big Creek wellfield (FS, 2015). City historical use from the Big Creek aquifer averages approximately 1,020 AF/y. There are numerous other wells withdrawing water from the Big Creek aquifer for industrial and irrigation purposes, with a permitted quantity of approximately 870 AF/y. There are also numerous domestic wells in the area withdrawing water from the Big Creek aquifer (BMcD, 2013).

Recharge to the Big Creek aquifer comes from surface water infiltration from Big Creek and infiltration of precipitation. During a drought, when precipitation and surface water flow is limited, water levels in the aquifer decline. With the assistance of Burns & McDonnell, the City developed an Aquifer Health Index (AHI) tool to evaluate the aquifer conditions (BMcD, 2015). The AHI tool tracks the condition of the aquifer and assists in managing the resource. Once the AHI identifies "Fair" or "Poor" aquifer conditions, the City is forced to reduce production from that wellfield and rely on another water source to meet demand. Without recharge, the aquifer is in a state of managed depletion, and the resource will not recover until precipitation and surface water infiltration return.

A review of the background data from monitoring wells C-24, YE-M2 and the Cemetery Well (Figure 2, BMcD, 2015) illustrates the situation. During the period of drought, the water level in

the aquifer declined steadily. Once precipitation and flow in Big Creek resumed, the aquifer level rebounded and the groundwater trends stabilized. Without precipitation resulting in streamflow in Big Creek, the water levels in the alluvial aquifer will continue to decline and the wellfield yield will decline with it.

During a 2-year (moderate) drought event water levels in the Big Creek wellfield will decline, as illustrated in Figure 1. During the 2-year 2011 to 2012 drought, water levels in the Big Creek wells did not decline sufficiently to limit production from the wells. This indicates that the maximum available yield of 1,429.46 AF/y could be theoretically pumped from the Big Creek Wellfield during a 2-year drought. This is a conservative estimate, however, as Hays only pumped 1,335.05 AF in 2011 and 1,342.36 AF in 2012, and it is reasonable to assume that the water levels in the wells would be lower if the full 1,429.46 AF were pumped each year.



BURNS McDONNELL

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No. 123193

File Name: BC Well Elev Hydrographs.gpj

Figure No. 1
Big Creek Wellfield
Water Level Hydrographs & Trends
Jan 2011 to Dec 2031

A 5-year (exceptional) drought event would result in significantly greater water level declines in the Big Creek aquifer. Water level declines that result in a 50 percent reduction in saturated thickness result in a significant reduction in the transmissivity (the ability of the aquifer to move water to a well) of the aquifer. This is due to the reduction in available pore space for water to move through. Extrapolating the water level declines from the 2011 to 2012 drought out for another three years (Figure 1) indicates that water levels in several of the Big Creek wells will drop below the 50 percent level during a drought and production will be reduced due to aquifer conditions. Loss of production from wells and decreased production from the remaining wells will limit the Big Creek wellfield to an estimated 85 percent of capacity. This indicates the sustainable yield of the Big Creek Wellfield after five years of exceptional drought would be approximately 1,040 AF/y.

Decadal and multidecadal droughts will result in a continued decrease of the City's ability to produce water from the Big Creek Wellfield. Extrapolating the observation well static water levels shown in Figure 1 through 20 years of drought results in a further decline in saturated thickness and available drawdown, with a resulting decrease in the ability to produce water. As discussed in the 2013 Big Creek Aquifer investigation report (BMcD, 2013), the bedrock geology of the Big Creek aquifer is highly variable. As water levels decline, the higher ridges of bedrock will restrict groundwater flow and limit the water available to individual wells. This will result in a greater loss of production over time, due to increasingly rapid declines in pumping ability, reduced aquifer transmissivity, and aquifer storage limitations.

Based on the extrapolated water levels, we estimate that only seven wells in the Big Creek Wellfield would remain capable of producing water in a decadal drought, and the capacity of those wells would be reduced. Based on the current yield of the wells that would remain available, and the estimated reduction in yield due to lower water levels, the Big Creek Wellfield would be able to produce approximately 620 AF/y after 10 years of drought. In a multidecadal drought, only five of those wells would remain capable of producing water, and those wells would have a greater reduction in production capability. It is estimated that the Big Creek Wellfield could only produce approximately 360 AF/y after a multidecadal drought.

Smoky Hill River Wellfield (SHRWF)

The SHRWF is located near Schoenchen, Kansas in the Smoky Hill River alluvial aquifer. It is composed of twelve shallow wells in the sand and gravel aquifer. The wellfield and aquifer have been studied extensively since the early 1990s, and the wellfield was renovated in the early 2000s to spread the wells out to reduce interference drawdown and increase access to available water in aquifer storage.

The alluvial aquifer and SHRWF are dependent on flow in the river for recharge. As illustrated by the release from Cedar Bluff Reservoir (BMcD, 2013) flow in the river rapidly infiltrates into

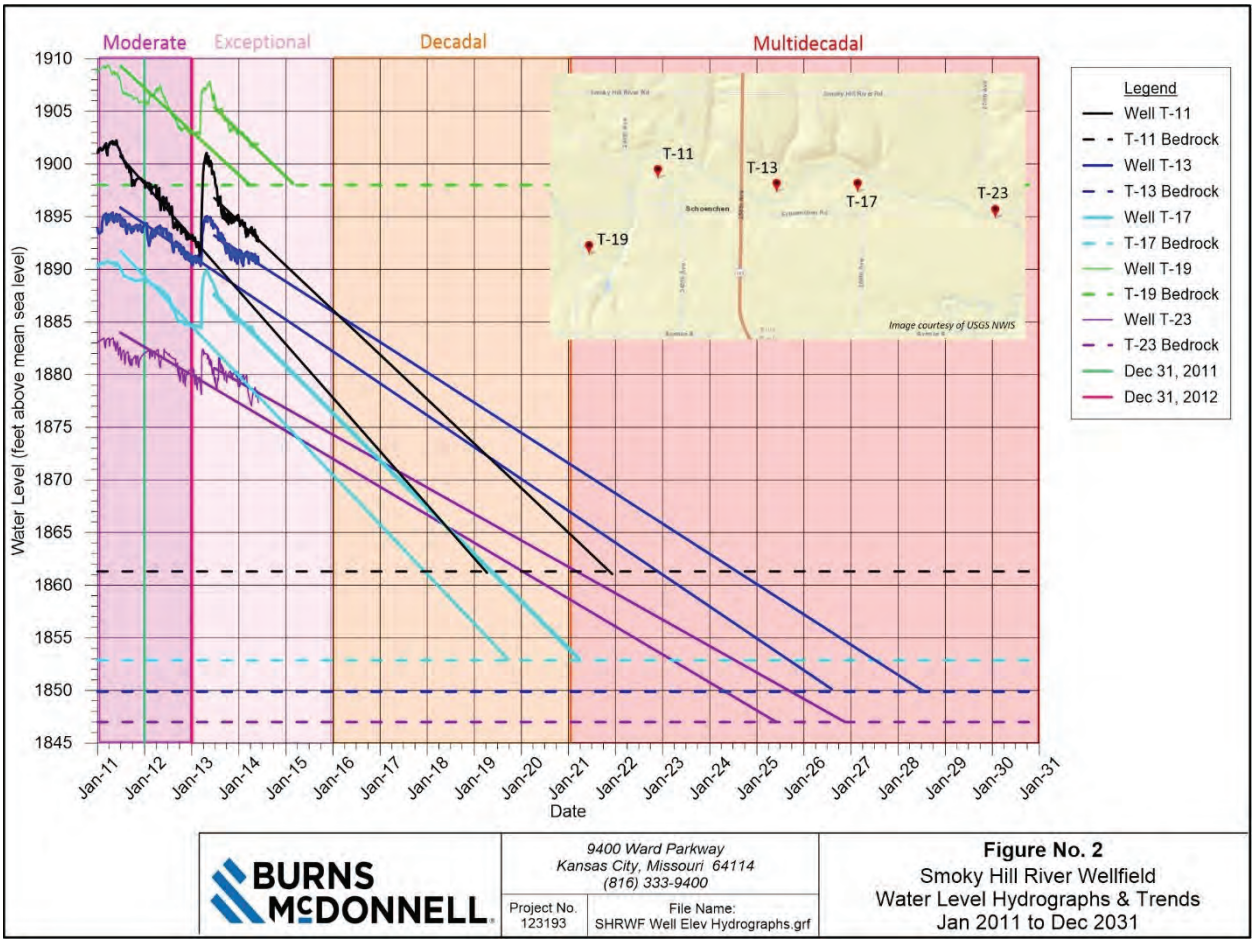
the aquifer and aquifer groundwater levels rise in a correspondingly short time frame. The 2013 release of 2,417 acre-feet from Cedar Bluff Reservoir in 2013 resulted in direct infiltration of 837 acre-feet of water into the SHRWF, and a resulting average groundwater level rise of six feet (BMcD, 2013).

DWR water rights currently limit the available water resource to 2,285 AF/y. This entire amount is sustainably available for pumping when there is as little as five cubic feet per second of flow in the Smoky Hill River. During periods of drought with limited precipitation and zero flow in the river, the wellfield is in a state of managed depletion, and aquifer levels decrease linearly over time. Groundwater flow modeling done at the time of the wellfield rehabilitation indicated that if drought results in zero flow in the river for a year, the wellfield yield is reduced to a maximum yield of 1,000 AF/y (BMcD, 2005). At this reduced production rate a significant amount of water will continue to be removed from storage in the aquifer at the SHRWF (BMcD, 2005). The longer a drought continues, the less the aquifer will yield due to aquifer storage depletions and associated groundwater level declines.

The model illustrates the dependency of the SHRWF yield on flow in the Smoky Hill River. From June 26, 2011 through March 8, 2013 the flow in the Smoky Hill River was essentially zero, and did not exceed 0.13 cfs at any time. A managed release of water from Cedar Bluff Reservoir was initiated on March 9, 2013, resulting in a maximum flow of 115 cfs at the upper end of the SHRWF. The release resulted in flow in the Smoky Hill River at the upper end of the SHRWF from March 9 until June 23, 2013. From June 24, 2013 until June 11, 2014, flow in the Smoky Hill River was again zero.

Figure 2 illustrates the water levels from the United States Geological Survey (USGS) monitoring wells located in the SHRWF from January of 2011 through June of 2014. Comparison of the water level trends from these wells for the periods of zero flow in the Smoky Hill River (June 26, 2011 to March 8, 2013 and June 24, 2013 to June 11, 2014) illustrates the linear decline in water levels, and how flow in the river immediately recharges the aquifer.

As shown in Figure 2, flow in the Smoky Hill River from the Cedar Bluff release rapidly recharged the aquifer. Flow in the Smoky Hill River from March 9, 2013 to June 23, 2013 resulted in as much as 11 feet of rebound to water levels in the aquifer. However, once flow in the river was again zero, the aquifer water levels immediately began a linear decline parallel to the previous decline. This clearly illustrates that without flow in the river the aquifer will cease to be a resource, emphasizing the impact of drought duration on the SHRWF.



BURNS McDONNELL

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No. 123193

File Name: SHRWF Well Elev Hydrographs.grf

Figure No. 2
Smoky Hill River Wellfield
Water Level Hydrographs & Trends
Jan 2011 to Dec 2031

The previously discussed modeling indicated that during a 2-year (moderate) drought event water levels in the Smoky Hill wellfield will decline at a linear rate. The historical water levels recorded during the 2011-2012 drought verified the modeling. Based on the modeling and historical water level and production data, the SHRWF will yield 1,000 AF/y during a 2-year drought.

Water level declines from the 2011 to 2012 time period were extrapolated out for another three years results to illustrate the effect of an exceptional drought of 5 years duration. The resulting water level drop results in the aquifer saturated thickness at multiple SHRWF wells declining below 50 percent. Reduced saturated thickness will result in less available drawdown and will limit the SHRWF to an estimated 60 percent of the moderate drought capacity. This indicates the sustainable yield of the SHRWF after five years of exceptional drought will be approximately 600 AF/y.

Decadal and multidecadal droughts will result in a continued decrease of the City's ability to produce water. Extrapolating the observation well static water levels shown in Figure 2 through 20 years of drought results in a further decline in saturated thickness and available drawdown, with a resulting decrease in the SHRWF's ability to produce water. Pumping water levels will decline more rapidly, due to the reduction in aquifer transmissivity. As the saturated thickness of the aquifer decreases, there is less available pore space to move water through, severely limiting the ability of the production wells to produce any water.

Based on the extrapolated water levels, it is estimated that the SHRWF yield at the end of a decadal drought would be less than 100 AF/y. At the end of a multidecadal drought the SHRWF would be unable to supply any water.

Dakota Wellfield

The Dakota Wellfield is located in a highly confined area of the Dakota Aquifer. When originally developed, the wells were constructed too closely together, resulting in interference effects between the wells during pumping operations. This limits the utilization of the wells. In addition, the water quality of the Dakota is poor, and blending with other sources is required to meet municipal water quality standards.

Multiple studies have been conducted for the City since 1992 evaluating the sustainable yield of the Dakota Wellfield (Hays, 2007). The total quantity of water allocated by the DWR is 882 AF/y, but the maximum historical volume pumped, which would be the maximum perfected volume available, is 511.89 AF/y (BMcD, 2008).

According to the reports, the annual quantity permitted by the water rights is not sustainable. Historical pumping records indicate that a yield of 120 AF/y is all that the Dakota can sustain without significantly depleting the resource and requiring years of recharge to reestablish the available water (Hays, 2007). Since the Dakota is highly confined, it should be able to yield 120 AF/y throughout a 2-year (moderate) or 5-year (exceptional) drought.

Based on the limited data available, the sustainable yield of the Dakota during a decadal or multidecadal drought should remain at 120 AF/y. While a yield of 120 AF/y appears to be sustainable long-term, there is no data to verify if the aquifer could support this yield in the long-term

SUMMARY

Standard analytical methods were used to do a high-level analysis of the sustainable yield of the wellfields belonging to the City of Hays under four drought conditions:

1. 2-year moderate drought,
2. 5-year exceptional drought,

3. 10-year decadal drought, and
4. 20-year multidecadal drought.

The estimated yield of the City's existing wellfields under these four drought scenarios are summarized in Tables 1 and 2. In the event of a longer drought than is projected in these calculations, it is reasonable to assume that water levels in the aquifer and the City's ability to produce water will continue to decline.

TABLE 1:
Estimated Wellfield Yield During 2-Year (Moderate) to 5-Year (Exceptional) Drought Conditions

Wellfield Name	Permitted Water Rights (acre-feet per year)	2-Year (Moderate) Drought Sustainable Yield (acre-feet per year)	5-Year (Exceptional) Drought Sustainable Yield (acre-feet per year)
Big Creek	1,429.46	1,429.46	1,040
Dakota	882	120	120
Smoky Hill	2,285	1,000	600
Total	3,675*	2,549.46	1,760

**Permitted water rights total is limited by permit conditions.*

TABLE 2:
Estimated Wellfield Yield During Decadal and Multidecadal Drought Conditions

Wellfield Name	Permitted Water Rights (acre-feet per year)	Decadal Drought Sustainable Yield (acre-feet per year)	Multidecadal Drought Sustainable Yield (acre-feet per year)
Big Creek	1,429.46	620	360
Dakota	882	120	120
Smoky Hill	2,285	100	0
Total	3,675*	840	480

**Permitted water rights total is limited by permit conditions.*

City of Russell Sources

BMcD did not have data to evaluate the long-term aquifer yield for Russell. The City of Russell has 1,842 AF/y of water rights, obtained from a surface water intake on Big Creek, and from wells located in the Pfeiffer Wellfield located in the Smoky Hill River alluvial aquifer. Per information received from City of Russell City Manager John Quinday, it is not uncommon for

Big Creek flows to be low enough to restrict the usage of the surface water intake. Once the surface intake is unusable, all supply is dependent on the Pfeifer Wellfield wells. The geologic setting of the Pfeifer wellfield is very similar to the SHRWF, so the aquifer response can be assumed to be similar as well. Based on this assumption, once flow stops in the Smoky Hill River, it can be assumed the Pfeifer Wellfield is pumping from storage and water levels will decline steadily.

The analysis summarized in this memo was conducted at a very high level, using simple, industry standard analytical methods. The evaluation of 2-year (moderate) drought conditions has a high level of confidence, since there is existing water level data from the wellfields from the 2-year drought that occurred in 2011 to 2012. Water level data from the wellfields during an exceptional, decadal, or multidecadal drought is not available. These drought estimates were extrapolated from the 2-year (moderate) drought data using industry standard, simple analytical methods that do not incorporate all hydrogeological factors. Factors such as well interference, groundwater flow out of the wellfield, reductions in transmissivity caused by decreased water levels, or barrier boundaries could potentially result in lower aquifer yield than estimated in this memo.

References:

Memo To Toby Dougherty from Brenda Herman, City of Hays, December 12, 2007.
Dakota Wellfield Evaluation, Burns & McDonnell, November 24, 2008.
Big Creek Aquifer Study, Burns & McDonnell, June 20, 2013
Big Creek Alluvial Aquifer Health Index, Burns & McDonnell, June 24, 2015.
Smoky Hill Wellfield Report, Burns & McDonnell, June 15, 2004.
Supplemental Modeling Report, Burns & McDonnell, September 30, 2005
Cedar Bluff Release Report, Burns & McDonnell, April 24, 2013
Public Information Circular 35, Kansas Geological Survey, 2013
Change Application Cover Letter, Foulston Siefkin, June 25, 2015

cc: Toby Dougherty – City of Hays
John Quinday – City of Russell

City of Hays
Public Works Department
1002 Vine

Memo

To: Toby Dougherty, City Manager

From: Brenda Herrman, Director of Public Works

Date: December 12, 2007

Re: Dakota Wellfield Recommendation

This particular wellfield has been studied numerous times since 1992. In early studies and documentation, it is obvious that the wellfield does not yield as much water as most confined aquifers. The Division of Water Resources made an exception to their regulations in allowing six (6) wells to be placed in this wellfield which violates their well spacing requirements. We have too many wells in this space.

Initially, the wellfield was pumped heavily to address the drawdown and capacity issues. It became clear that pumping more than 50-to100 gallons per minute (GPM) would deplete the water in the aquifer in a few years.

Of the six wells, one well is pumped at a time. Most of the year the well produces 50 GPM; during peak months it pumps 100 GPM. In doing so, the City has perfected about 120 acre-feet of the 882 acre-feet identified by the State. The most the City can hope for is this 120 acre-feet for a long-term sustainable yield.

By keeping all six wells, City staff must turn each pump on quarterly to make sure it is functioning properly. One of the six pumps runs all the time. The other five set dormant until it is that pump's turn to perform.

Staff has reviewed several scenarios to come to some conclusions:

Leave the Dakota Wellfield As-is

To leave the Dakota wellfield as-is, the 2006 cost of production for the 43,000,000 gallons of Dakota water was approximately $68,500 per year. This includes lease payments of $30,730.32 in 2006; $33,125.88 in 2007; and $35,521.44 in 2008 to five lessees for the six wells.

Put All Six Dakota Wells into a Water Rights Conservation Program

The State will allow this wellfield to be put into conservation status for a minimum of 5 years and a maximum of 10 years. The contract would have the possibility of renewal. The approximate 120 acre-feet of water rights would remain with the City.

The wellfield could be resurrected with permission from the Chief Engineer of the Division of Water Resources in the event of a drought emergency.

The property for each existing well would have to be purchased or a long-term agreement with the current property owners that the City of Hays would have the right to have access to these sites to reinstate the wells.

If the wells were put into conservation, the Chief Engineer would declare no more appropriations from this wellfield.

If the wellfield was put into conservation, the operating and maintenance cost would be zero. The land would need to be secured or continue with lease payments. There would be a cost for the land, depending on purchase or lease.

Because of the make-up of the water in the Dakotas, when we blend 100 GPM with Smoky and/or Big Creek waters, there is an annual reduction in chemical cost of about $4,000. If the wells are in conservation, that $4,000 cost would have to be assigned to the Smoky and/or Big Creek cost of production figures.

Reduce the Number of Wells in the Dakota Wellfield

Since it's already been determined that these six wells are spaced too close together, a logical option would be to reduce the number of wells. The Division of Water Resources would allow this and the City would still retain the approximate 120 acre-feet of water rights that have already been perfected. A Change in the Point of Division application would need to be filed for each well taken out of service so that those water rights would be re-assigned to the wells left in service.

If the wellfield is reduced to three (3) wells instead of the six (6) wells, one could expect a reduction of one-half the lease payment or about $15,365 savings per year. If the property is bought out-right, the annual savings would be about $31,000.

The operating and maintenance cost that is seen today is pumping one well plus payment of leases. Again, the savings would be in the lease payments.

Reducing the wellfield to two (2) wells is something to consider since only one well is pumped at a time. This would provide redundancy and there would be many spare parts from the other four (4) wells taken out of service.

In the reduction scenario, whether it is reduced to 3 or 2 wells, the spacing and locations within the aquifer would need to be considered.

Recommendation

As Director of Public Works, I think some changes need to occur in this wellfield. I would like to have Burns and McDonnell look at the existing studies and tell the City the best spacing and locations for a reduced wellfield. At least half the wells could be taken out of service. There is the potential that the three well sites selected to be retained would be the only land purchase that would need to occur.

The reduction scenario could take a "phased" effect. Some action could be taken in the short-term without taking the entire wellfield out of service. In future years, the remaining wells could be put into conservation if it is deemed appropriate at that time.

Due to the sensitive nature of water issues, it may be advisable to wait until after the acquisition of the Smoky Wellfield Expansion well sites before making any information public about reducing the Dakota Wellfield as this action could be perceived as negative.

City of Hays
Public Works Department

Memo

To: Toby Dougherty, City Manager

From: John Braun, Assistant Director of Public Works

cc: Mark Loughry, Assistant City Manager
Brenda Herrman, Director of Public Works
Joe Obholz, Superintendent of Utilities

Date: December 6, 2007

Re: Dakota Wells Sustainable Yield

Per your request, I have researched studies which would indicate the sustainable yield from the City's Dakota Well Field.

I found quite a bit of data and several studies in our files. Listed below is a chronological list of information:

March 1992	Black and Veatch	Statement of Qualifications
May 1992	Ground Water Associates	Pump Test Report
June 1992	Black and Veatch	Raw Water Supply and Recharge Feasibility Letter Report
March 1993	Black and Veatch	Aquifer Yield Analysis Letter Report
January 1994	Black and Veatch	Water Resource Evaluation Letter
March 1995	Ground Water Associates	Dakota Well Data Permanent Record
April 1995	Black and Veatch	Long Term Water Supply -- Dakota Aquifer Memo
May 1995	Black and Veatch	Yield Evaluation Memo

G:\Group\Jbraun\Memos\07-12-04 Dakota Wells Sustainable Yield.doc

February 1998	Kansas Geological Survey	An Evaluation of the Long-Term Effect of Water Resources Development on the Dakota Aquifer in the Vicinity of the Hays Well Field – Volume 1
February 1998	Kansas Geological Survey	An Evaluation of the Long-Term Effect of Water Resources Development on the Dakota Aquifer in the Vicinity of the Hays Well Field – Volume 2
February 1998	Kansas Geological Survey	An Evaluation of the Long-Term Effect of Water Resources Development on the Dakota Aquifer in the Vicinity of the Hays Well Field – Summary
May 1998	Black and Veatch	Russell and Hays Yield Update – Letter Report to PWWSD #15

Although a the sustainable yield estimated from the City's Dakota Well Field evolved somewhat over the course of the above mentioned reports. The final letter report from Black and Veatch indicated that pumping 400 AF per year for 8.5 years would deplete the aquifer and it would take an extended period of time to recover. Pumping at 650 AF per year would deplete the aquifer in 5 years. They indicated that the aquifer could sustain continuous pumping of 100 AF per year. Over the last 10 years, we have typically pumped 120 AF per year from the Dakota Wells.

The bottom line is that the Dakota Aquifer is a confined water source with limited or slow recharge capability. The past 10 years plus of pumping has proven that the well field can sustain a pumping rate of 50 to 100 GPM or 120 AF per year (40,000,000 gallons). With the current water treatment process, we could not use much more Dakota Water than the 50 to 100 GPM since the Dakota water is high in chlorides and blending with other water sources is required to meet our municipal drinking water quality standards.

I have attached the May 1998 Black and Veatch Report for your reference. If you would like to review any or all of the other referenced reports, let me know and I will make them available to you.

Know the Public Works is preparing and will be submitting to you a more comprehensive analysis of the Dakota Well Field and our recommendations for the future utilization of that water source.

CITY OF HAYS

MONTHLY WATER PRODUCTION REPORT

MONTH: Jan.-Dec. 2006

PLANT INFLUENT	GALLONS		EFFLUENT TO MAINS	GALLONS	
TOTAL	725,459,030		E-WELLS	0	
MINIMUM	1,039,000	DATE: 12-25	PLANT EFF.	725,459,030	
MAXIMUM	4,392,000	DATE : 7-21	TOTAL	725,459,030	
DAILY AVG.	1,987,559		MINIMUM	379,000	DATE: 10-24
			MAXIMUM	3,393,000	DATE: 7-19
			DAILY AVG.	1,987,559	

LOSS TO PLANT	USE TO PLANT	STATE SAMPLES	PLANT SAMPLES	METERED CONSUMPTION	LOSS & CITY USE
0	0	240	20,075	651,369,101	74,089,929
%	%			GALS.	10%

RECLAIMED FROM LAGOONS 17,040,100 Gallons

AVERAGE TOTAL HARDNESS	RAW WATER	6,432	FILTER EFFLUENT	1,772

CHEMICALS USED (POUNDS)

LIME	MG/L	GPG	**SODA ASH**	MG/L	GPG
1,145,793	189	11.06	1,407,715	232	13.58
FERRIC	MG/L	GPG	**AMMONIA**	MG/L	GPG
111,250	18.3	1.07	20,750	3.42	0.20
CL2	MG/L	GPG	**FLUORIDE**	MG/L	GPG
47,882	7.87	0.46	4,000	0.68	0.04

LOCATION	CU. FT. PUMPED	GALLONS PUMPED	K.W.H. USED	K.W.H./1000 GALS.	POWER COST	COST PER 1000 GALS.
New CL2 1024056-2			34,358		$ 2,840.25	
Smoky CL2 1024063-8			27,248		$ 2,342.49	
Booster St. #1 1024069-5			11,040		$ 1,220.82	
Booster St. #2 1024070-3			10,400		$ 911.39	
Old Res. CL2 1024090-1			0		$ 120.00	
Old Res. Pump #1 1024091-9			5,240		$ 537.94	
Old Res. Pump #1 1024093-5			0		$ 120.00	
Water Plant 1024105-7			5,376		$ 1,345.76	
Water Plant 1024104-0	96,986,501	725,459,030	1,034,240	1.43	$ 77,548.96	$0.11
I-70 Water Tower			2,142		$ 1,467.01	
Canterbury Water Tower			16,783		$ 1,569.81	
Cemetary MW			0		$ 120.00	
Wilson MW			928		$ 206.80	
C-19 MW			853		$ 199.63	
41st & Fort Booster			51,840		$ 5,193.35	
TOTAL	96,986,501	725,459,030	1,200,448	1.65	$ 95,744.21	$0.13

GAS USED

WATER PLANT	10,741 CU. FT.	COST $11,451.96	RESERVOIR PUMP ST.	380 CU. FT.	COST $551.69

COMMENTS

WELL PRODUCTION	576,543,430
AIR STRIPPER	148,915,600
TOTAL PRODUCTION	725,459,030

2006	Influent Total Hardness	Filter Effluent Total Hardness
January	496	131
February	517	138
March	533	136
April	524	139
May	528	143
June	521	142
July	529	164
August	536	147
September	556	138
October	556	149
November	568	152
December	566	185
Total	**6430**	**1764**

2006 Distribution Coliform Samples Total Hardness

January	126
January	121
January	115
February	125
February	130
February	128
March	121
March	144
March	120
April	117
April	137
April	134
May	132
May	143
May	133
June	132
June	125
June	161
July	229
July	139
July	150
August	147
August	136
August	145
September	133
September	134
September	144
October	127
October	135
October	153
November	138
November	150
December	140
December	153
December	129
Total	**4826**

CITY OF HAYS

MONTHLY WATER PRODUCTION REPORT

MONTH: Jan.-Dec. 2006

WELL NO.	CU. FT. PUMPED	GALLONS PUMPED	K.W.H. USED	GAL K.W.H./1000	POWER COST	COST 1000 GALS.	HRS. PUMPED
			CITY WELLS				
C-17*	0	0	3		$ 120.25		
C-19	6,556,114	49,039,730	62,108	1.27	$ 5,179.60	$ 0.11	7089.8
C-20	0	0	88,419		$ 7,081.89		7714.5
C-21*	0	0	11		$ 120.96		
C-24*	27	200	3,904	19,520	$ 449.98	$ 2,249.90	
C-27	752,861	5,631,400	6,160	1.09	$ 702.59	$ 0.12	551.8
C-28A	6,511,471	48,705,800	35,600	0.73	$ 3,145.13	$ 0.06	4323.7
C-29*	27	200	1,520	7,600	$ 255.57	$ 1,277.85	
C-30*	0	0	1,728		$ 274.08		
C-31	6,046,417	45,227,200	33,859	0.75	$ 2,961.87	$ 0.07	4267.7
C-32	1,797,299	13,443,800	17,140	1.28	$ 1,492.16	$ 0.11	2019
C-33	1,356,083	10,143,500	15,940	1.57	$ 1,459.53	$ 0.14	2489
YE-1	1,807,995	13,523,800	0				3576
YE-2	2,440,575	18,255,500	31,200	1.71	$ 2,726.44	$ 0.15	3137
TOTAL	27,268,868	203,971,130	297,592	1.46	$ 25,970.05	$ 0.13	35,168.5
			DAKOTA WELLS				
D-1	89,960	672,900	3,980	5.92	$ 437.48	$ 0.65	172
D-2	281	2,100	3,920	1,960	$ 432.69	$ 216.35	0
D-3	0	0	1,408		$ 252.94		0
D-4	49,746	372,100	3,000	8.06	$ 374.94	$ 1.01	89
D-5	5,605,495	41,929,100	125,960	3.00	$ 10,156.24	$ 0.24	8487
D-6	41,297	308,900	4,200	13.64	$ 452.22	$ 1.47	77
TOTAL	5,786,778	43,285,100	142,468	3.29	$ 12,106.51	$ 0.28	8,825
			SMOKY WELLS				
S-6	736,832	5,511,500	11,326	2.06	$ 925.21	$ 0.17	377
S-7	3,666,925	27,428,600	35,068	1.28	$ 2,921.84	$ 0.11	1515
S-8	8,798,436	65,812,300	98,236	1.49	$ 7,602.75	$ 0.12	4688
S-10 w/S-18	4,072,233	30,460,300	0	0.24	$ -	$ -	1716
S-11	11,642,714	87,087,500	112,040	1.29	$ 9,319.75	$ 0.11	4764
S-12	3,036,350	22,711,900	30,680	1.35	$ 2,469.19	$ 0.11	1420
S-13	1,816,096	13,584,400	26,304	1.94	$ 2,284.20	$ 0.17	856
S-14	2,103,369	15,733,200	25,160	1.60	$ 1,916.90	$ 0.12	1248
S-15	1,481,644	11,082,700	10,480	0.95	$ 1,093.55	$ 0.10	518
S-16 w/S-17	1,834,813	13,724,400	0	0.05	$ -	$ -	828
S-17	2,023,904	15,138,800	44,104	2.91	$ 5,399.74	$ 0.36	1105
S-18	2,809,037	21,011,600	64,160	3.05	$ 6,459.40	$ 0.31	1056
TOTAL	44,022,353	329,287,200	457,558	1.41	$ 40,392.53	$ 0.12	20,091
Air Stripper	19,908,503	148,915,600	185,046	1.24	$ 12,998.92	$ 0.09	
GRAND TOTAL	96,986,501	725,459,030	1,082,664	1.50	$ 91,468.01	$ 0.13	64,084.5

* Emergency Wells

2006 Cost Calculation to Produce Water from Various Sources

Input data

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Water production	148,604,530.00	23,587,300.00	31,779,300.00	43,285,100.00	329,287,200.00	148,915,600.00	725,459,030.00
Rental Costs	$ -	$ 10,531.44	$ 13,738.92	$ 30,730.32	$ 59,947.56	$ -	$ 114,948.24
Electrical Costs	$ 20,291.92	$ 2,951.69	$ 2,726.44	$ 12,106.51	$ 47,707.48	$ 12,998.92	$ 98,782.96
Hardness (ppm)	480	433	443	40	582	480	536

Total Actual O&M Cost	$ 845,503.00
Soda Ash Usage (tons)	703.9
Soda Ash Cost ($/ton)	$ 240.25
Lime Usage (tons)	572.9
Lime Cost ($/ton)	$ 140.00
Ave Effluent Hardness	147.0

notes: Big Creek does not include C-32, C-33, YE-1, and YE-2
Smoky Wells include Booster Station Costs
Costs based on Year 2006

Water Softening Calculation

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Water Production %	20.48%	3.25%	4.38%	5.97%	45.39%	20.53%	100.00%
Difference from Effluent	333.0	286.0	296.0	(107.0)	435.0	333.0	389.0
Influence Factor	68.21	9.30	12.97	-6.38	197.45	68.36	389
Soda Ash use per ppm							1.809511568
Lime Use per ppm							1.472750643
Soda Ash Use (tons)	123.4	16.8	23.5	-11.6	357.3	123.7	703.9
Lime Use (tons)	100.5	13.7	19.1	-9.4	290.8	100.7	572.9
Soda Ash Cost	$ 29,654.33	$ 4,042.56	$ 5,637.00	$ (2,775.45)	$ 85,837.29	$ 29,716.41	$ 169,111.98
Lime Cost	$ 14,064.38	$ 1,917.29	$ 2,673.50	$ (1,316.34)	$ 40,710.69	$ 14,093.82	$ 80,206.00

O&M Calculations

Total O&M Cost	$ 845,503.00
Electrical Cost	$ (98,782.96)
Soda Ash Cost	$ (169,111.98)
Lime Cost	$ (80,206.00)
Base O&M Cost	$ 497,402.07

Water Production Cost Calculations ($ per Million Gallons)

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Base O&M Cost	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64
Electrical Cost	$ 136.55	$ 125.14	$ 85.79	$ 279.69	$ 144.88	$ 87.29	$ 136.17
Soda Ash Cost	$ 199.55	$ 171.39	$ 177.38	$ (64.12)	$ 260.68	$ 199.55	$ 233.11
Lime Cost	$ 94.64	$ 81.28	$ 84.13	$ (30.41)	$ 123.63	$ 94.64	$ 110.56
Rental Cost	$ -	$ 446.49	$ 432.32	$ 709.95	$ 182.05	$ -	$ 158.45
Cost to Produce 1MG	**$ 1,116.38**	**$ 1,509.94**	**$ 1,465.26**	**$ 1,580.75**	**$ 1,396.88**	**$ 1,067.12**	**$ 1,323.92**
Total Cost of Production	$ 165,899.50	$ 35,615.32	$ 46,564.95	$ 68,422.94	$ 459,974.74	$ 158,911.30	$ 960,451.24

Cost Calculation to Produce Water from Various Sources

Input data

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Water production	148,604,530.00	23,587,300.00	31,779,300.00	43,285,100.00	329,287,200.00	148,915,600.00	725,459,030.00
Rental Costs	$ -	$ 10,531.44	$ 13,738.92	$ 15,365.16	$ 59,947.56	$ -	$ 99,583.08
Electrical Costs	$ 20,291.92	$ 2,951.69	$ 2,726.44	$ 12,106.51	$ 47,707.48	$ 12,998.92	$ 98,782.96
Hardness (ppm)	480	433	443	40	582	480	536

Total Actual O&M Cost	$ 845,503.00
Soda Ash Usage (tons)	703.9
Soda Ash Cost ($/ton)	$ 240.25
Lime Usage (tons)	572.9
Lime Cost ($/ton)	$ 140.00
Ave Effluent Hardness	147.0

notes: Big Creek does not include C-32, C-33, YE-1, and YE-2
Smoky Wells include Booster Station Costs

Scenario 2: Dakota Production and Electrical the same - 1/2 Rental Costs

Water Softening Calculation

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Water Production %	20.48%	3.25%	4.38%	5.97%	45.39%	20.53%	100.00%
Difference from Effluent	333.0	286.0	296.0	(107.0)	435.0	333.0	389.0
Influence Factor	68.21	9.30	12.97	-6.38	197.45	68.36	389
Soda Ash use per ppm							1.809511568
Lime Use per ppm							1.472750643
Soda Ash Use (tons)	123.4	16.8	23.5	-11.6	357.3	123.7	703.9
Lime Use (tons)	100.5	13.7	19.1	-9.4	290.8	100.7	572.9
Soda Ash Cost	$ 29,654.33	$ 4,042.56	$ 5,637.00	$ (2,775.45)	$ 85,837.29	$ 29,716.41	$ 169,111.98
Lime Cost	$ 14,064.38	$ 1,917.29	$ 2,673.50	$ (1,316.34)	$ 40,710.69	$ 14,093.82	$ 80,206.00

O&M Calculations

Total O&M Cost	$ 845,503.00
Electrical Cost	$ (98,782.96)
Soda Ash Cost	$ (169,111.98)
Lime Cost	$ (80,206.00)
Base O&M Cost	$ 497,402.07

Water Production Cost Calculations ($ per Million Gallons)

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Base O&M Cost	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64
Electrical Cost	$ 136.55	$ 125.14	$ 85.79	$ 279.69	$ 144.88	$ 87.29	$ 136.17
Soda Ash Cost	$ 199.55	$ 171.39	$ 177.38	$ (64.12)	$ 260.68	$ 199.55	$ 233.11
Lime Cost	$ 94.64	$ 81.28	$ 84.13	$ (30.41)	$ 123.63	$ 94.64	$ 110.56
Rental Cost	$ -	$ 446.49	$ 432.32	$ 354.98	$ 182.05	$ -	$ 137.27
Cost to Produce 1MG	**$ 1,116.38**	**$ 1,509.94**	**$ 1,465.26**	**$ 1,225.77**	**$ 1,396.88**	**$ 1,067.12**	**$ 1,302.74**
Total Cost of Production	$ 165,899.50	$ 35,615.32	$ 46,564.95	$ 53,057.78	$ 459,974.74	$ 158,911.30	$ 945,086.08

Cost Calculation to Produce Water from Various Sources

Input data

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Water production	148,604,530.00	23,587,300.00	31,779,300.00	43,285,100.00	329,287,200.00	148,915,600.00	725,459,030.00
Rental Costs	$ -	$ 10,531.44	$ 13,738.92	$ -	$ 59,947.56	$ -	$ 84,217.92
Electrical Costs	$ 20,291.92	$ 2,951.69	$ 2,726.44	$ 12,106.51	$ 47,707.48	$ 12,998.92	$ 98,782.96
Hardness (ppm)	480	433	443	40	582	480	536

Total Actual O&M Cost	$ 845,503.00
Soda Ash Usage (tons)	703.9
Soda Ash Cost ($/ton)	$ 240.25
Lime Usage (tons)	572.9
Lime Cost ($/ton)	$ 140.00
Ave Effluent Hardness	147.0

notes: Big Creek does not include C-32, C-33, YE-1, and YE-2
Smoky Wells include Booster Station Costs

Scenario 3: **Buy out of Dakota Well Sites** **$200,000**
Purchase price amortized over **15 Years**
Interest Rate **5%**
Annual Payment: $19,268.46

Water Softening Calculation

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Water Production %	20.48%	3.25%	4.38%	5.97%	45.39%	20.53%	100.00%
Difference from Effluent	333.0	286.0	296.0	(107.0)	435.0	333.0	389.0
Influence Factor	68.21	9.30	12.97	-6.38	197.45	68.36	389
Soda Ash use per ppm							1.809511568
Lime Use per ppm							1.472750643
Soda Ash Use (tons)	123.4	16.8	23.5	-11.6	357.3	123.7	703.9
Lime Use (tons)	100.5	13.7	19.1	-9.4	290.8	100.7	572.9
Soda Ash Cost	$ 29,654.33	$ 4,042.56	$ 5,637.00	$ (2,775.45)	$ 85,837.29	$ 29,716.41	$ 169,111.98
Lime Cost	$ 14,064.38	$ 1,917.29	$ 2,673.50	$ (1,316.34)	$ 40,710.69	$ 14,093.82	$ 80,206.00

O&M Calculations

Total O&M Cost	$ 845,503.00
Electrical Cost	$ (98,782.96)
Soda Ash Cost	$ (169,111.98)
Lime Cost	$ (80,206.00)
Base O&M Cost	$ 497,402.07

Water Production Cost Calculations ($ per Million Gallons)

	Big Creek	C-32 and C-33	YE-1 and YE-2	Dakotas	Smokys	Air Stripper	Total
Base O&M Cost	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64	$ 685.64
Electrical Cost	$ 136.55	$ 125.14	$ 85.79	$ 279.69	$ 144.88	$ 87.29	$ 136.17
Soda Ash Cost	$ 199.55	$ 171.39	$ 177.38	$ (64.12)	$ 260.68	$ 199.55	$ 233.11
Lime Cost	$ 94.64	$ 81.28	$ 84.13	$ (30.41)	$ 123.63	$ 94.64	$ 110.56
Rental Cost	$ -	$ 446.49	$ 432.32	$ -	$ 182.05	$ -	$ 116.09
Amortized Purchase	$ -	$ -	$ -	$ 445.15	$ -	$ -	$ 26.56
Cost to Produce 1MG	**$ 1,116.38**	**$ 1,509.94**	**$ 1,465.26**	**$ 1,315.95**	**$ 1,396.88**	**$ 1,067.12**	**$ 1,308.12**
Total Cost of Production	$ 165,899.50	$ 35,615.32	$ 46,564.95	$ 56,961.07	$ 459,974.74	$ 158,911.30	$ 948,989.38

2005
for '04

Dakota Well Leases

Earl and Elaine Sunley ~~1716 Felten~~ 81 P 200th Ave Hays, KS 67601	Dakota 1 and Monitoring Well Monthly Payment: $448.15

Julius and Mary Rohr 3108 Boston Wichita, KS 67218	Dakota 2 and Dakota 3 and Monitoring Well Monthly Payment: 768.26

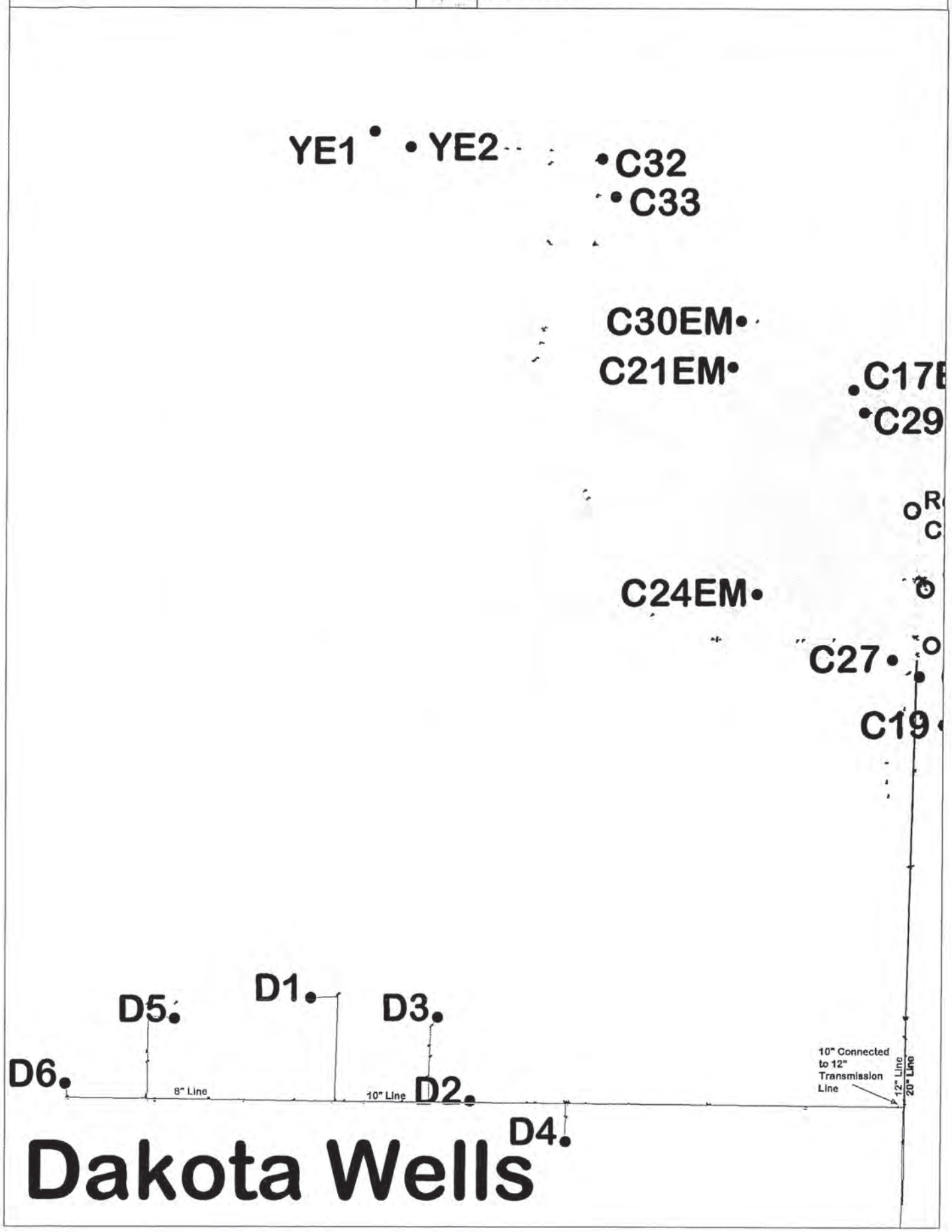
VFM Holding "A" Trust 2310 Buckeye Road Victoria, KS 67671	Dakota 4 and Monitoring Well Monthly Payment: $448.15

Lookout Trust 840 150th Ave. Hays, KS 67601	Dakota 5 and Monitoring Well Monthly Payment: 448.15

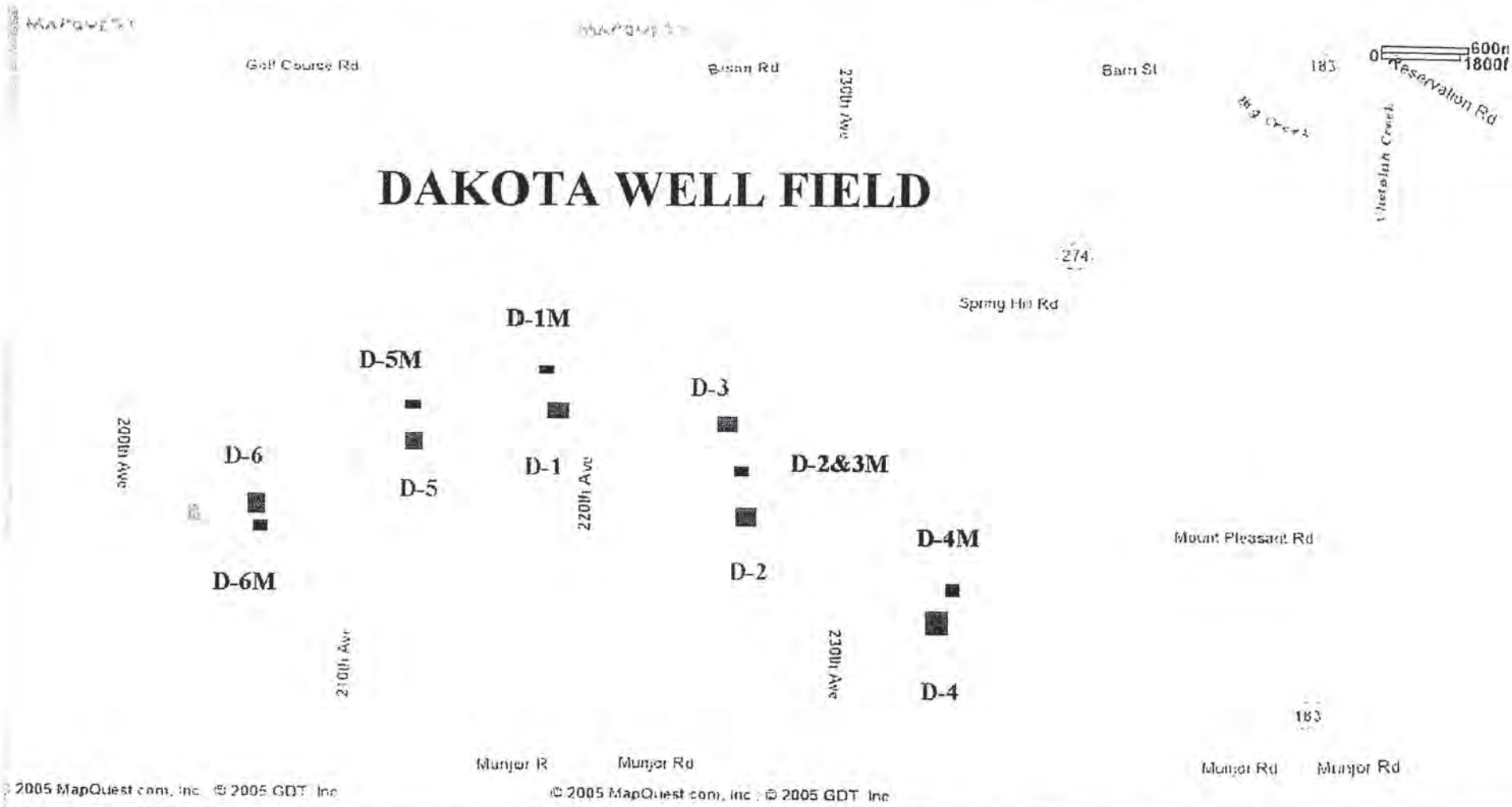
Harold and Virginia Kraus 977 Chetolah Gold Road Hays, KS 67601	Dakota 6 and Monitoring Well Monthly Payment: 448.15

FROM: CORI

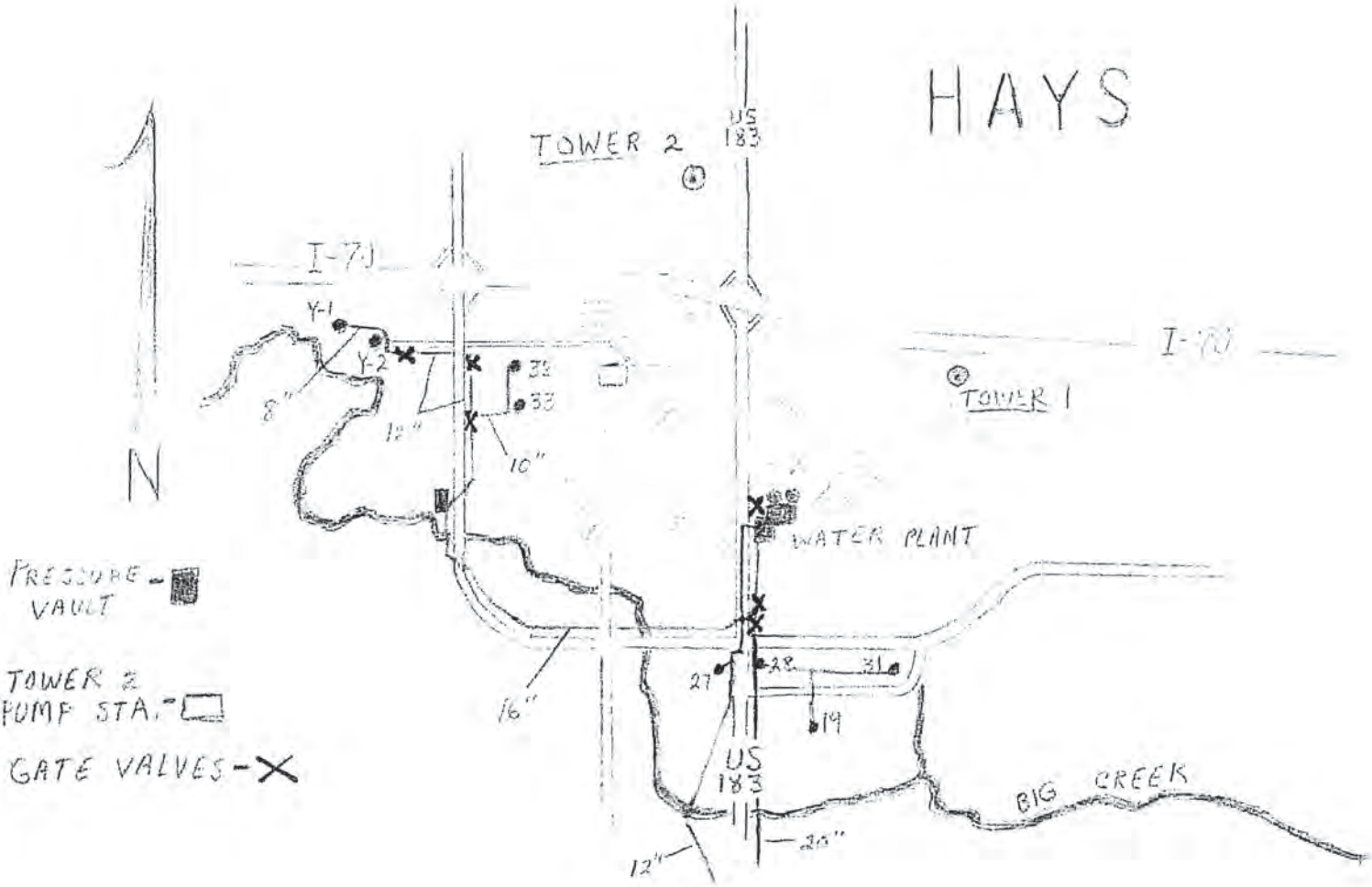
CITY OF HAYS WELL FIELDS

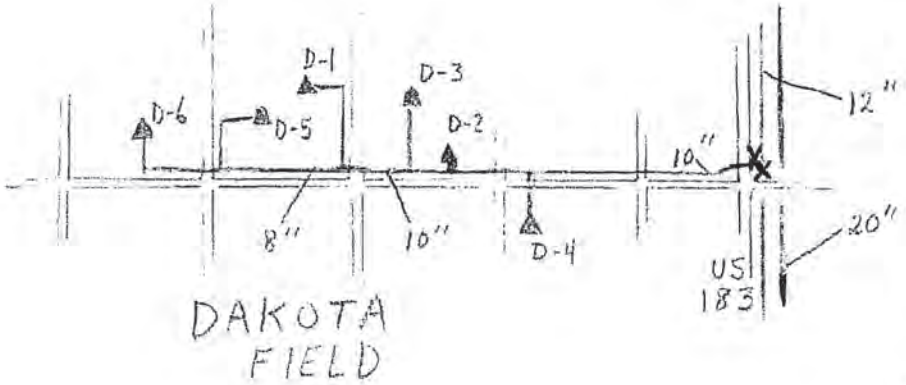


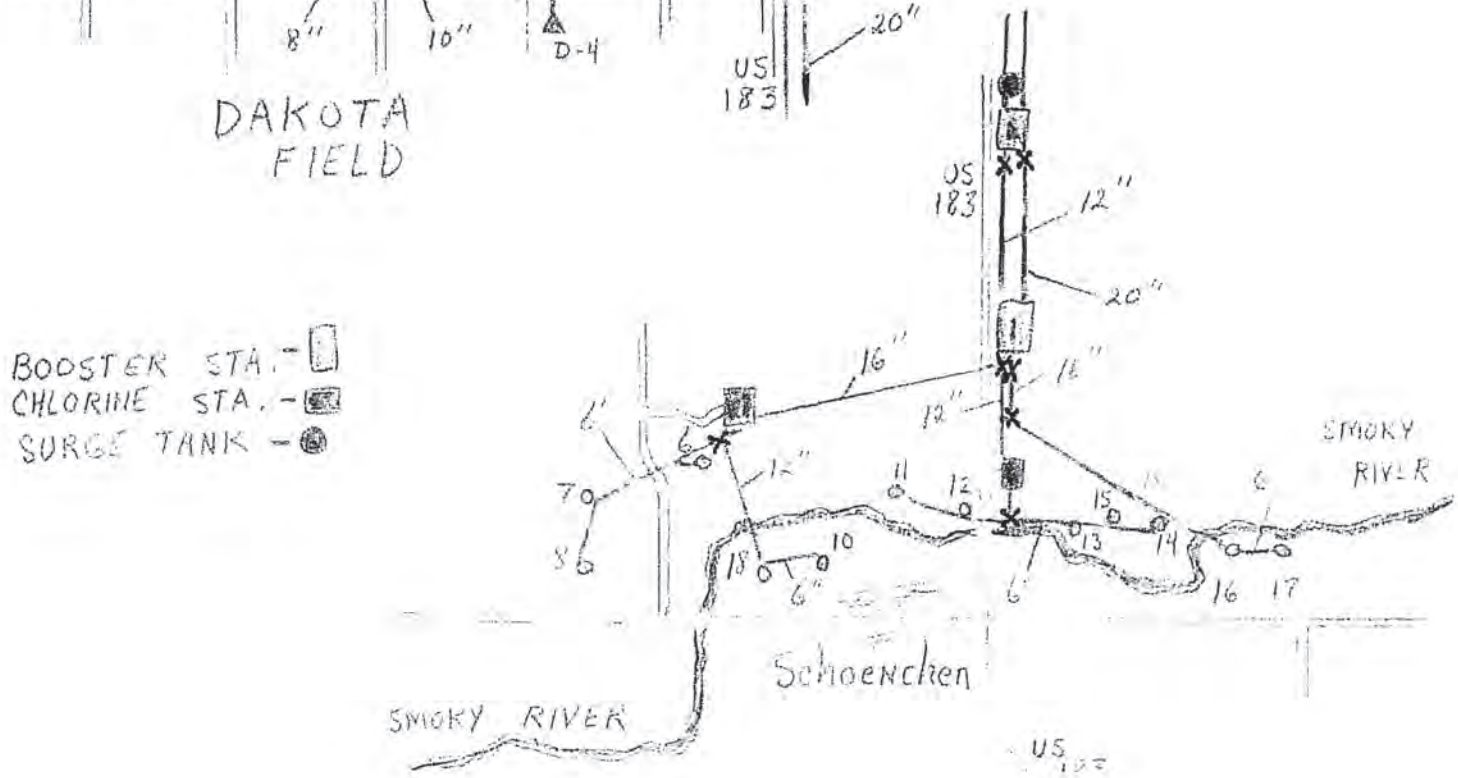
DAKOTA WELL FIELD



HAYS


N
TOWER 2
US 183
I-70
Y-1
Y-2
8"
12"
10"
32
33
TOWER 1
WATER PLANT
PRESSURE VAULT
TOWER & PUMP STA.
GATE VALVES
16"
27
28
31
19
US 183
BIG CREEK
12"
20"


D-1
D-3
D-6
D-5
D-2
D-4
12"
10"
8"
10"
20"
US 183
DAKOTA FIELD


US 183
12"
20"
BOOSTER STA.
CHLORINE STA.
SURGE TANK
16"
16"
12"
12"
6"
7
8
11
12
15
13
14
6
16
17
10
18
6"
6"
SMOKY RIVER
Schoenchen
SMOKY RIVER
US

Dakota Well Field Evaluation

Background

The City of Hays installed 6 wells into the Dakota formation in the early 1990's to provide an additional emergency water supply. The wells were drilled under Division of Water Resources (DWR) water appropriation file numbers 40,702 through 40,707. Total authorization for the well field is 882 acre-feet per year at rates of 200 gpm for two wells and 250 gpm for 4 wells.

Subsequent to installation and initial testing, it was determined that the well field would be unable to produce the authorized amounts and several studies were undertaken to quantify the well field's "sustainable yield." Because of lack of detailed aquifer data, groundwater modeling was inconclusive in determining the sustainable yield. Analysis of initial test indicated that the annual production rates may be limited to 100 to 120 acre-feet per year at rates of 50 to 100 gpm per well.

In order to maximize potential perfection and certification of the water rights, the City instituted a program to concentrate pumping at one well for one calendar year to maximize the amount pumped.

Because of the relatively low volume of water produced by the Dakota Well Field and high operating costs (including leasing costs), the City wishes to review the existing studies and information to determine if the number of well could be reduced, resulting in cost savings. This memo briefly reviews the existing studies, current data and discussions with DWR about potential reduction in the number of wells in the Dakota Well Field.

Well Construction and Aquifer Data

The following table shows the well depth and length of screen installed in each Dakota well. Also shown is the sand or sandstone thickness indicated on the driller's log and the original specific capacity. The table shows that the wells with the most screen and sand thickness have the better specific capacity.

Well	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**
Depth	529	512	510	475	552	554
Screen	63	80	80	95	80	60
Sand thickness	63	86	96	118	84	62
Specific Capacity (orig)	3.93	5.11	5.28	7.59	4.03	2.18
Specific Capacity (current)	3.6	7.5	--	--	3.6	2.0

Static Water Level

	Static Water Level		
	Mar 1992	May 1993	Jun 2008
D1	256.4[1]	318	268.09
D2	221.6[1]	281	234.29
D3	239.5[1]	317	250.13
D4	195.12[2]	246	202.33
D5	267.10[2]	331	276.03
D6	261.5[1]	364	274.05

Notes: 1. Static water level from driller's log
2. Reported from Bob Vincent 1992 summary of the Dakota Well Information

Water Quality

Chloride (mg/L)

Well	1994	Q4 05	Q1 06	Q2 06	Q3 06	Q4 06	Q3 07
D1	712	585	660	660	540	620	560
D2	1003	665	750	640	680	600	510
D3	708	603	580	--	520	580	580
D4	874	678	700	760	560	660	650
D5	705	599	610	660	500	590	--
D6	719	592	580	670	510	590	570

Water Diverted

Year	AF Used
1992	6.0
1993	107.7
1994	67.3
1995	79.7
1996	87.6
1997	49.2
1998	74.5
1999	77.8
2000	79.6
2001	115.6
2002	120.2
2003	117.6
2004	96.1
2005	105.4
2006	132.9
2007	0.0
Total	1317.0

Maximum Volume Used

Well	Volume Pumped Acre-feet	Year
D1	119.59	2002
D2	32.74	2005
D3	128.68	2006
D4	95.87	2004
D5	117.57	2003
D6	17.44	1993

Recent Data
Static water level data from January 1, 2006 was graphed to review responses of the aquifer to pumping. From approximately January 12, 2006 until January 1, 2007, Well No. 5 was pumped. The rate was initially about 70 gpm and was later raised to about 95 gpm. It appears that pumping levels nearly stabilized about 7 months into the pumping period. There has apparently been no Dakota Well Field pumping since January 1, 2007 and water levels have nearly recovered to pre-pumping conditions. The 2006 to current water level data is shown in Figure 1.

Analysis
Typically, spacing is important in minimizing interference drawdown between wells. By increasing the distance between two wells, the impacts of pumping one well is reduced on the second well. In well field planning, well spacing along with other factors such as available drawdown, pipeline distance (and costs) and land purchase need to be jointly considered to develop a cost effective design.

Potential for Aquifer Storage and Recovery
In several areas of the country, aquifers with poorer quality water have been developed for aquifer storage and recovery (ASR) projects. The concept is to pump potable (or good quality raw water) into an aquifer for later recovery and use. Typically, the "bubble" of fresh water stored underground is recovered, disinfected and pumped into the distribution system or to a treatment plant. ASR water provides for daily or seasonal peak use or for emergency use if other parts of a system are not available.

The Hays Dakota wells have the potential to store a limited quantity of water for supplemental or emergency use.

A cursory evaluation of the Dakota wells indicate that wells could possibly recharge about 100 to 150 gpm which would be equivalent to about 0.4 to 0.7 acre-feet per day. This assumes that recharge could occur when there is flow in the Smoky Hill River in excess of what is needed for municipal use. On the average, that would be about 70 percent of the year or about 255 days per year, yielding about 112 acre-feet stored each year.

It is assumed that the water could be recovered from the well field at peak rates of 250 to 300 gpm. This is above the earlier sustainable yield; however, from the drawdown graphs and earlier testing, it appears that this rate could be maintained for a relatively long period of time.

The City has used the well field since 1992 and has pumped about 1317 acre-feet in that time period. This is probably the maximum volume that could be easily stored in the aquifer for later retrieval.

Currently the City has about 2.5-MGD average-day and 5.6-MGD peak-day water demands. Recovery from the Dakota well field could potentially meet 10 to 20 percent of the maximum and average day demands respectively. The length of time that the well field would be available would depend on the volume of water stored.

If the City considers ASR to be a viable option, there are several steps/studies that would have to be performed to finalize plans, obtain water rights, make necessary construction modifications and begin operation. These activities include:

- Perform a geochemical evaluation to determine if the two water qualities are compatible and the Smoky Hill River water would not react with the aquifer materials and plug the formation or the well
- Review and inspect the Dakota well field infrastructure to determine what pipeline, valve and metering improvements would be required for initial testing and operation
- Perform cyclic injection tests where a large volume of water is injected into the well and later recovered to determine what fraction of the good quality water can be recovered
- Prepare and obtain ASR water rights
- Finalize system construction and begin operation.

Conclusions

Water rights for the Dakota wells total 882 acre-feet per year; however, the total maximum historical volume pumped is 511.89 acre feet which would be the maximum perfected volume for the well field. The actual amount that could be perfected may be less because of other DWR limitations placed on the water right applications.

The City's objectives of reducing well field costs by reducing the number of wells appears to be feasible without the loss of any potentially perfected water. The total pumping rate for the maximum potentially perfected water is about 320 gpm. This rate could be easily accommodated by two wells: however, maintaining a third well for backup is desirable.

Review of the collected data indicates that the wells could maintain a slightly higher pumping rate than exercised in the past. Based on the data from Well No. 5, an additional 50 to 75 gpm should be achievable for a relatively long time (2 to 4 years).

The most favorable wells to retain would be those in that portion aquifer with the best yield characteristics. These would include Wells 2, 3 and 4.

Because the aquifer is confined, significant interference drawdown can extend across the entire well field producing a relatively flat cone of depression after extended pumping. Differences in the interference drawdown between near and distant wells appear not to be significant. Therefore, maintaining wells with large distance separation does not have as high a priority as maintaining wells with greater yield characteristics.

The reduced number of wells could potentially be used for a small aquifer storage and recovery system. Recharge water would come from the Smoky Hill River Well Field when available. Rough estimates indicate that approximately 100 AFY could be recharged depending on actual climate conditions. The water could be recovered at rates of up to 300 (+) gpm and used. Approximately 80 to 90 percent of the water recovery would be similar in quality to the SHRWF water. After that point poorer quality aquifer water would be expected.

Preliminary feasibility studies will be required to evaluate the ASR potential and probable costs.

June 20, 2013

Mr. Toby Dougherty
City Manager
City of Hays, Kansas
1507 Main Street
Hays, Kansas 67601-3642

Re: 2013 Big Creek Well Field Study
Burns & McDonnell Project 68917

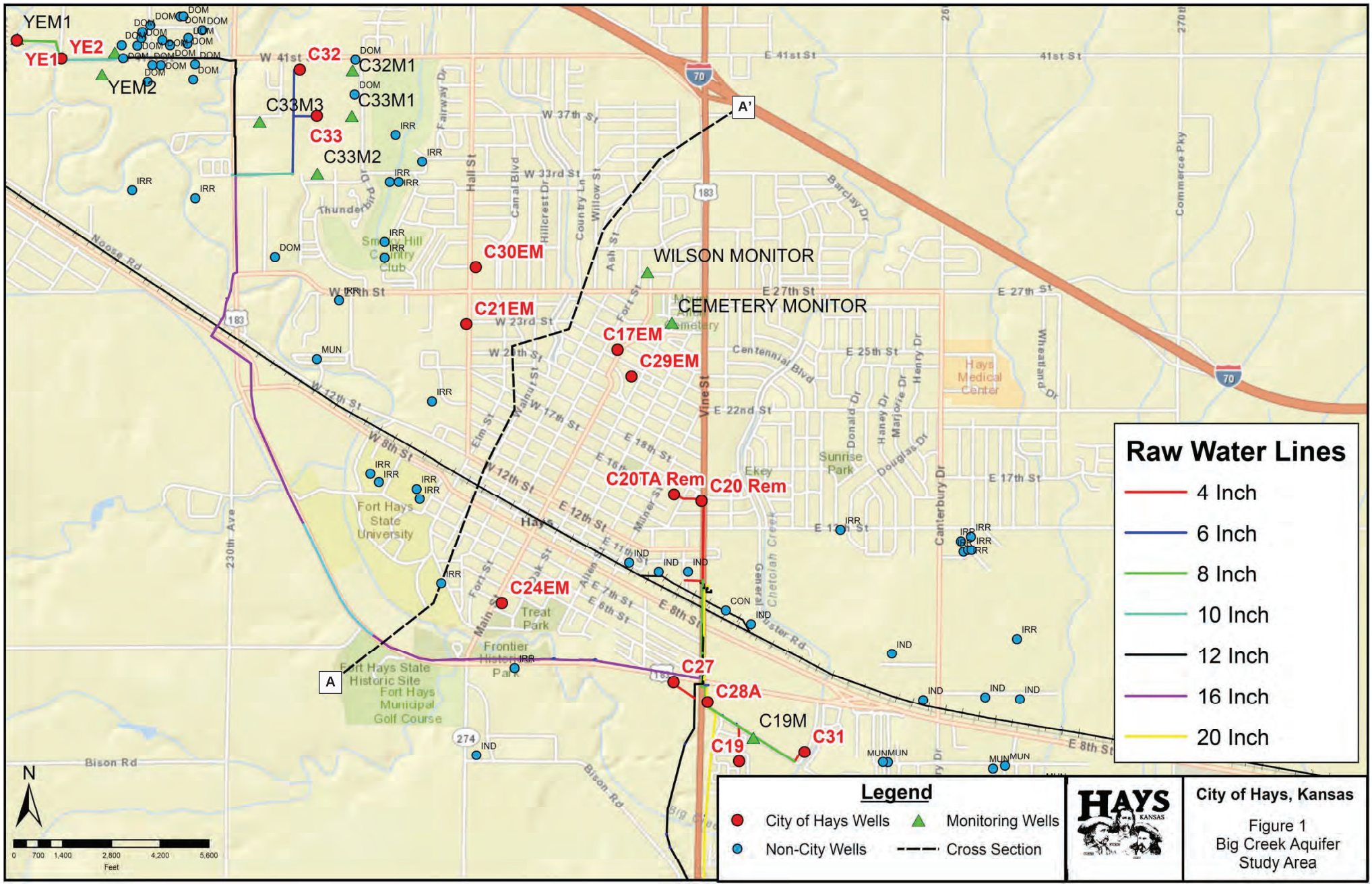
Dear Mr. Dougherty,

The City of Hays (City) contracted with Burns & McDonnell (BMcD) to complete a study of the Big Creek aquifer to evaluate the long-term viability of the water source. The City has three well fields supplying water to its customers; twelve wells in the Smoky Hill River Well Field (SHRWF), a group of six wells in the Dakota formation (Dakota Wells) and the Big Creek Well Field. The Big Creek Well Field consists of fifteen (15) wells located throughout Hays along Big Creek and completed in the Big Creek alluvial aquifer. The Big Creek alluvial aquifer in the Hays area has been named as an Intensive Groundwater Use Control Area (IGUCA). A copy of the IGUCA order is included for reference in Appendix A. Figure 1 is a map of Hays showing the well locations and the raw water pipeline.

A number of information sources were consulted for this study including the City's files, published reports from the U.S. Geological Survey (USGS) and the Kansas Geological Survey (KGS), previous studies performed for the City of Hays, and databases operated by the USGS, KGS, the Kansas Department of Agriculture Division of Water Resources (DWR), and the Kansas Department of Health and Environment (KDHE).

The purpose of this study is to determine the current operating condition of the Big Creek Well Field wells, estimate the short-term and long-term yield of the well field, and recommend improvements to the well field.

800 E. First St. • Suite 400 • Wichita, KS 67202-2798
Tel: 316 941-3921 • Fax: 316 941-4730 • www.burnsmcd.com



HAYS KANSAS

City of Hays, Kansas

Figure 1
Big Creek Aquifer
Study Area

Executive Summary

The City of Hays (City) contracted with Burns & McDonnell (BMcD) to complete a study of the Big Creek aquifer and the fifteen (15) wells operated by the City as the Big Creek Well Field to evaluate the long-term viability of the water source. This aquifer has been named as an Intensive Groundwater Use Control Area (IGUCA) in the vicinity of Hays. The purpose of this study is to determine the current operating condition of the Big Creek Well Field wells, estimate the short-term and long-term yield of the well field, and recommend improvements to the well field.

A detailed evaluation of the Big Creek aquifer was completed. The Big Creek Alluvial aquifer is a highly complex, heterogeneous, shallow sand and gravel alluvial environment formed by the changing course of Big Creek. Recharge to the aquifer comes from water flowing in Big Creek or from precipitation that falls along the Big Creek Valley and infiltrates into the aquifer.

All of the Big Creek wells are limited to a total water rights allocation of 1227.55 acre-feet per year. Pumping data from 2011 and 2012 indicate that the City is using approximately 1020 acre-feet annually from the Big Creek aquifer. Numerous domestic wells withdraw water from the aquifer as well.

The highly variable bedrock topography has a direct impact on variations in groundwater flow and results in significant water production challenges. High ridges in the bedrock surface restrict or completely cut off groundwater flow if there are significant changes in the water levels within the aquifer.

Historical data from the City's files and well testing associated with this project were used to evaluate the well condition and efficiency. The wells are in very good condition due to on-going maintenance efforts and careful tracking and interpretation of well operational data, and are operating at high efficiencies.

Some minor modifications of the Big Creek wells could result in significant benefits to the Big Creek well field. These include:

- Develop an index for monitoring the overall aquifer health.
- Contact the regulatory agencies about transferring a permanent water right to Wells C-20 and C-20TA for further municipal use after the remediation is complete.
    - Relocate Well C-17 water rights to C-20/C-20TA or relocate Well C-17 away from residence and connect it to the raw water system.
- Relocate Well C-24 and connect to the raw water system.
- Develop a plan to relocate/connect emergency wells to the raw water supply in the future.

Background Data

Data Collection & Review
To begin the evaluation of the well field, data from the City's files, USGS, DWR, and KGS were collected and reviewed. Numerous borehole records were reviewed and evaluated to determine the aquifer extent, depth to bedrock, and aquifer material thickness. Numerous publications and reports were reviewed from the regulatory agencies and City files. Historical well production data was provided by the City, along with well maintenance records, construction data, and mechanical information.

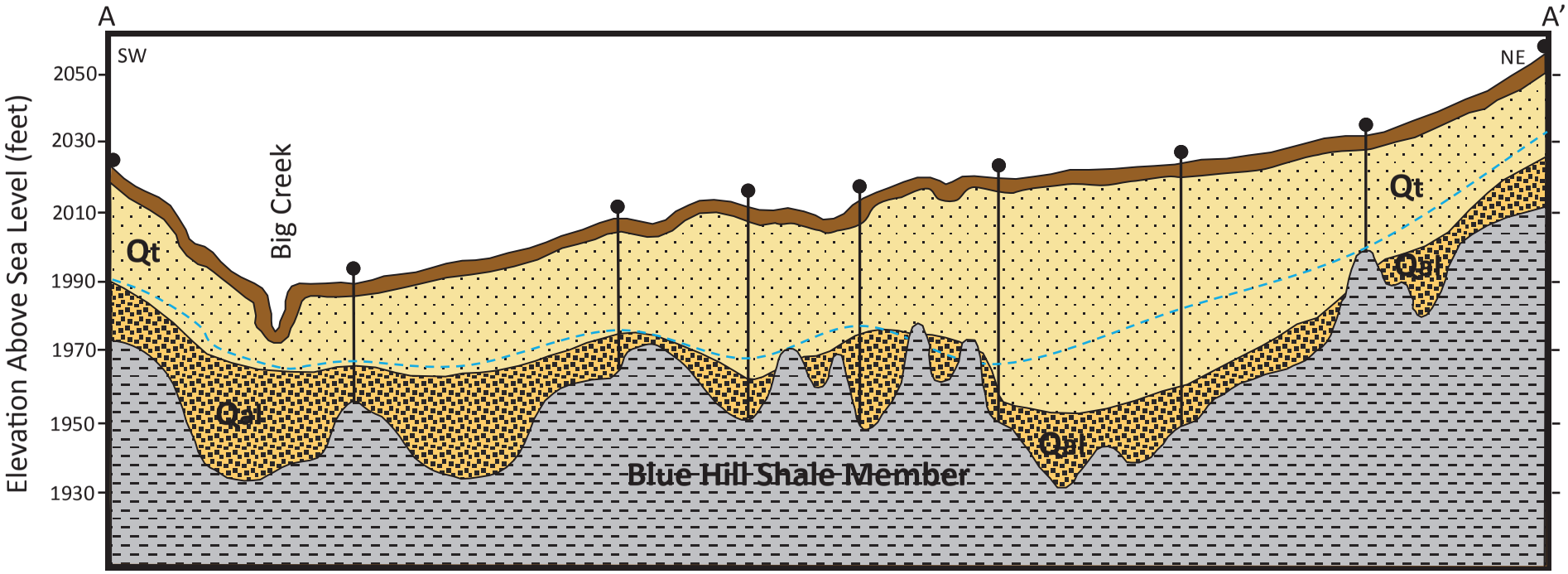
During the data review, substantial existing data was found and reviewed. The City reports contain information regarding aquifer materials and testing from the mid- 1990s Big Creek water banking project. A large number of test borings, modeling efforts and aquifer tests were conducted as a part of that project that provided significant data for the area. In addition, several graduate thesis papers were reviewed that provided additional valuable data about the aquifer.

The above referenced data was reviewed and compiled to assist in the well field evaluation. The following sections summarize the available data.

Geologic Description of the Study Area
The Big Creek alluvial aquifer is a shallow sand and gravel aquifer associated with Big Creek. The aquifer was formed when flows from Big Creek cut into the shale bedrock and also deposited sand and gravel material. Terrace deposits formed by historic floodplains overlie the alluvium. The lateral extent of the aquifer is confined by the shale bedrock defining the Big Creek flow channel. In general, the finer grained sediments in the terrace deposits are less transmissive and have lower yields than the Big Creek alluvium.

Pleistocene aged terrace deposits formed by historical floodplains of Big Creek overly the alluvial aquifer. These terrace deposits have a limited interconnection with the alluvial aquifer and are generally considered a separate aquifer. The terrace deposits are composed of silt and sands, and range in thickness from 0 to 70 feet. Figure 2 is a cross section modified from previous studies that passes through the center of Hays and illustrates the complex geologic environment that forms the Big Creek aquifer.

The Big Creek Alluvial aquifer consists of stream-deposited materials that are highly heterogeneous and generally consists of coarse sand and gravel. Lenses of fine grained materials, such as clay and silt, are scattered throughout the aquifer. Thickness of the alluvium is highly variable and ranges from 0 to 50 feet in the study area.



Explanation

Scale: Feet
0 1600
Vertical Exaggeration - 40x

Soil — Surface Soils - Silty Loams

Qt — Quarternary - Terrace Deposits, Silt & Clay

Qal — Quarternary - Alluvium, Floodplain & Low-Terrace Deposits Sand & Gravel Aquifer Material

Kcb — Cretaceous - Blue Hill Shale Member

Borehole Log - Water Well Completion

Groundwater Level - Approximate

Source: Modified from *Perez 1986, page 38, Geohydrology of the Big Creek Alluvial Aquifer of Hays and Vicinity, Ellis County, Kansas*

Burns & McDonnell SINCE 1898

Figure 2

Big Creek Aquifer
Cross Section A - A'

The bedrock beneath the alluvial channel consists primarily of the Blue Hill Shale. The Big Creek Valley has been incised into the bedrock, resulting in substantial variations in the bedrock surface as the historic stream channel meandered back and forth. The shale bedrock that underlies the aquifer is highly impermeable and does not appear to permit passage into or out of the alluvium.

Recharge

Recharge to the aquifer comes from water flowing in Big Creek or from precipitation that falls along the Big Creek Valley and infiltrates into the aquifer. Big Creek is typically a losing stream, meaning that when there is flow in the stream it infiltrates through the streambed into the aquifer. The connection between Big Creek and the aquifer is limited, unlike in the SHRWF where infiltration is extremely rapid. Flow duration in Big Creek is a critical component of the amount of recharge to the aquifer. A sudden event, where the flow increases rapidly and tapers rapidly off to zero will not result in significant infiltration to the aquifer. A longer duration of flow, even at very low volume, will result in more recharge to the aquifer.

Precipitation is another source of recharge to the system. The terrace deposits are typically finer grained materials that absorb and hold water. The domestic use and the storage capacity of the terrace deposits reduce the amount of infiltration to the Big Creek aquifer. Precipitation that falls directly on the Big Creek aquifer materials, in the area adjacent to and along Big Creek, infiltrates much more effectively into the aquifer system. However, the aquifer is exposed in a limited area, and as a rule of thumb, on average only 20% of the precipitation that falls infiltrates into the soil. The volume of water infiltrating can be significantly impacted by the intensity and or duration of a given precipitation event.

Water Use

All of the Big Creek wells are limited to a total water rights allocation of 1227.55 acre-feet per year. This allocation consists of 1227.55 acre-feet under Vested Right File No. EL002 and 133 acre-feet from Water Right File No. 33,548. Water Right EL002 applies to all of the City's wells except YE-1, YE-2, C-20 and C-20TA. File No. 33,548 applies to the YE wells; C-20 and C-20TA are operated under a term permit (No. 20109043) associated with ongoing remediation efforts.

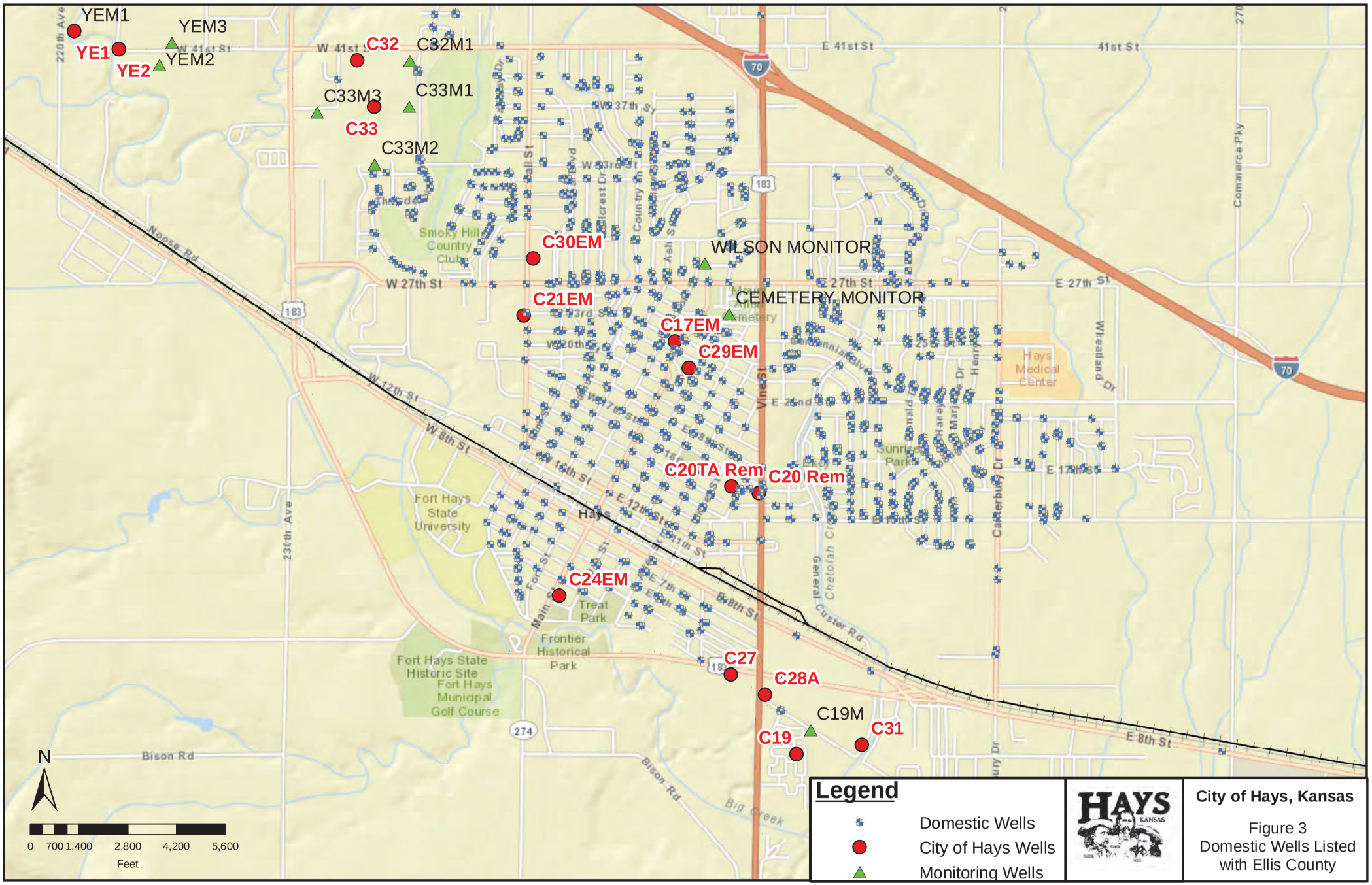
In 2012 the City pumped approximately 520 acre-feet of water from permanent water rights in the Big Creek aquifer for municipal use. In addition, a total of approximately 500 acre-feet per year has been historically pumped from several remediation wells (400 acre-feet per year from C-20 and C-20TA and 100 acre-feet per year from a number of other remediation sites). Water from these wells is sent through an air stripper and then to the WTP, and is metered separately. These totals indicate that the City is using approximately 1020 acre-feet annually from the Big

Creek aquifer. It should be noted that the City is limited to a total of 3675 acre-feet per year from the Big Creek well field, SHRWF, and the Dakota well field, combined.

In addition to the City's water rights, a number of other wells with water rights also utilize the Big Creek alluvial aquifer as a water resource as illustrated in Figure 1. These additional water rights are lower in priority (junior) to the City's vested Ellis County Water Right EL002. The individual quantities authorized by these wells are relatively small when compared to the City's wells, however cumulative authorized water use from these wells is approximately 870 acre-feet, and for the year 2011 actual cumulative use totaled nearly 300 acre-feet. The majority of water from these wells is used for irrigation and a table summarizing the water rights in the study area is included as Appendix B.

Numerous domestic wells are also screened in the Big Creek aquifer. Ellis County implemented a voluntary registration program for small, domestic wells in approximately the year 2000, in an effort to determine the number of domestic water users in the area. Through this program 1823 wells were registered with the county. DWR has estimated that there are actually as many as 3000 domestic wells in the City. These wells receive recharge from the same sources, and so they compete with the City's municipal wells for available water. In addition a large number of these older domestic wells may not be constructed to modern KDHE requirements (proper grouting, casing, licensed installation) which presents a groundwater contamination risk. There is no published information currently available indicating how frequently the domestic wells are used or the volume of water that they consume. Additional regulations in regards to minimum well construction standards and mandatory registration of both existing and proposed domestic wells may be appropriate to better protect the aquifer and also quantify domestic use; especially in areas with denser development near existing City wells. Figure 3 is a map of Hays showing the approximate locations of the domestic wells currently registered with the county.

Since the actual number of domestic wells in the area is unknown, the volume of water consumed by domestic users is also unknown. As part of this study, an attempt was made to calculate an estimate of the volume of water pumped by domestic users. An approximate an amount of water consumed by the domestic well users was calculated. The method used was a conservative common-sense approach, assuming a total of 2000 domestic wells are currently utilized, at a flow rate of five gallons per minute for two hours each day, for four months of the year. This indicates a total of approximately 450 acre-feet per year of water is removed from the aquifer by domestic well users.



City of Hays, Kansas

Figure 3
Domestic Wells Listed with Ellis County

Description of Existing Infrastructure

The City has fifteen wells in the Big Creek Well Field. Of these wells, ten are connected into the raw water supply system and provide water to the Water Treatment Plant (WTP) for normal operation. Two of the wells, C-20 and C-20TA, are used for remediation of a contaminant plume through pump and treat methodology. The discharge from this well is pumped through an air stripper to remove volatile organic compounds, prior to be sent to the WTP. The remaining five wells are emergency wells that pump directly into the distribution system in the event that there is a problem with the other wells or with the plant. Table 1 summarizes the well construction and production information for the wells. The utilization of the emergency wells is very infrequent.

The raw water supply lines connect ten of the Big Creek, the SHRWF and the Dakota Wells to the WTP. These lines are of varying age and size, and are illustrated on Figure 1. The lines connecting the Big Creek wells to the WTP are located mostly along the south and west sides of Hays. The ratio of water from the various sources can have a significant impact on the water treatment process.

Table 1. Well Construction Summary.

Well No.	Flow Rate (gpm)	Casing Diameter (in)	Screen Length (ft)	Well Depth (fbg)	Comments
C-17	200	12	10	60.67	Emergency Well (directly into distribution system)
C-19	200	12	10	41.18	
C-20	250	12	10	53.67	Remediation Well (pumps to air stripper & then WTP)
C-20TA	150	6	20	68.00	Remediation Well (pumps to air stripper & then WTP)
C-21	120	12	10	71.00	Emergency Well (directly into distribution system)
C-24	125	12	5	38.33	Emergency Well (directly into distribution system)
C-27	250	12	10	53.42	
C-28A	195	12	15	58.50	
C-29	150	12	15	76.00	Emergency Well (directly into distribution system)
C-30	150	12	13	86.00	Emergency Well (directly into distribution system)
C-31	180	12	15	58.80	
C-32	125	12	13	95.50	
C-33	75	12	10	88.40	
YE-1	75	12	10	64.00	
YE-2	110	12	12	70.55	

Field Testing
Field testing was conducted in August of 2012 on eight of the Big Creek wells to determine the current operational condition of the wells. All of the tested wells pump directly to the WTP. Due to the on-going drought conditions, it was decided not to test the emergency wells, as the discharge from those wells would have to be directed onto the ground, wasting a significant volume of water. The tests were designed to evaluate well condition, determine well efficiency, and test the mechanical equipment in the wells. To accomplish this, five-hour duration step-rate pumping tests were completed on the wells.

Testing procedures consisted of shutting down wells the evening before testing which allowed adequate time for the aquifer to recover to static conditions. Prior to the pumping tests the static water level in each well was measured and recorded. The well pump was started with the discharge valve closed to determine the shut-off head of the pump. The valve was then opened and adjusted to the first selected pumping rate for the well. Flow rates were measured with the in-line flow meters mounted in each well, and discharge was directed to the WTP.

Water levels were recorded at each well at four successively higher flow rates, or steps. For each step, a steady flow rate was maintained for a duration of approximately one hour. Water levels were measured frequently at the beginning of each step, and less frequently as time progressed. After an hour, or once water levels had stabilized, the valve was adjusted to the next higher flow rate and measurements for the next step were taken.

Pressure data recorders were also installed on the raw water supply line to record system pressures for the duration of the testing. Data loggers were installed at Wells C-19, C-21, C-28A, C-31, C-32, C-33 YE-1 and YE-2, the WTP and on air relief valves on the 12-inch and 20-inch supply lines bring water from the SHRWF and Dakota Wells, at a point just south of well C-27. These data loggers recorded the pressure in the line at one minute intervals from August 11 through August 29.

Aquifer System Evaluation

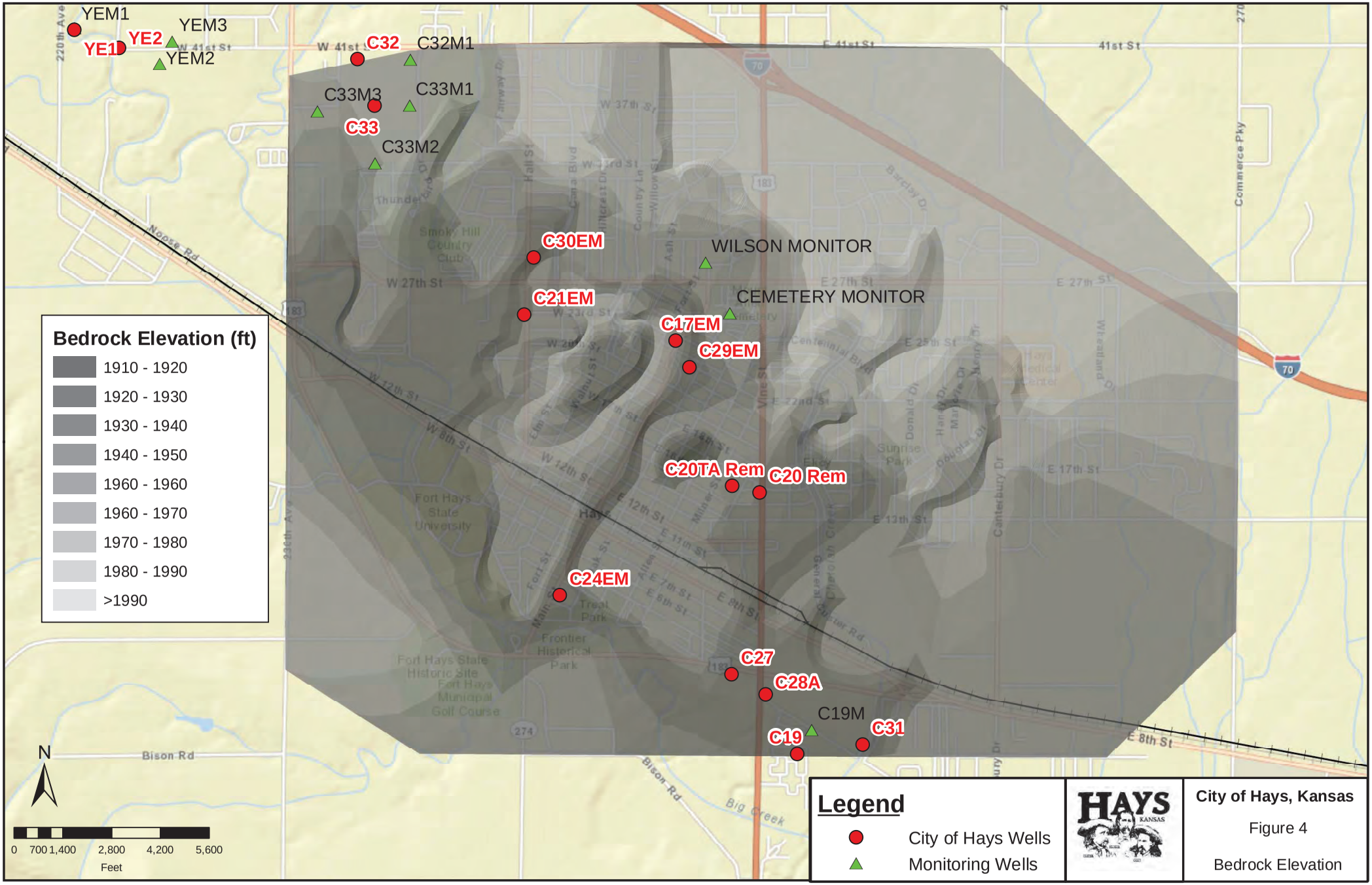
Impacts of Aquifer Geology
A detailed evaluation of the Big Creek aquifer was completed. The Big Creek aquifer is a highly complex alluvial environment formed by the changing course of Big Creek. Initially, Big Creek incised the river valley into the Blue Hill shale member, and filled it in with a mixture of sand and gravel. A geologic map of all of Ellis county is included in Appendix C. The extent of the aquifer is shown by the yellow shaded areas running along Big Creek.

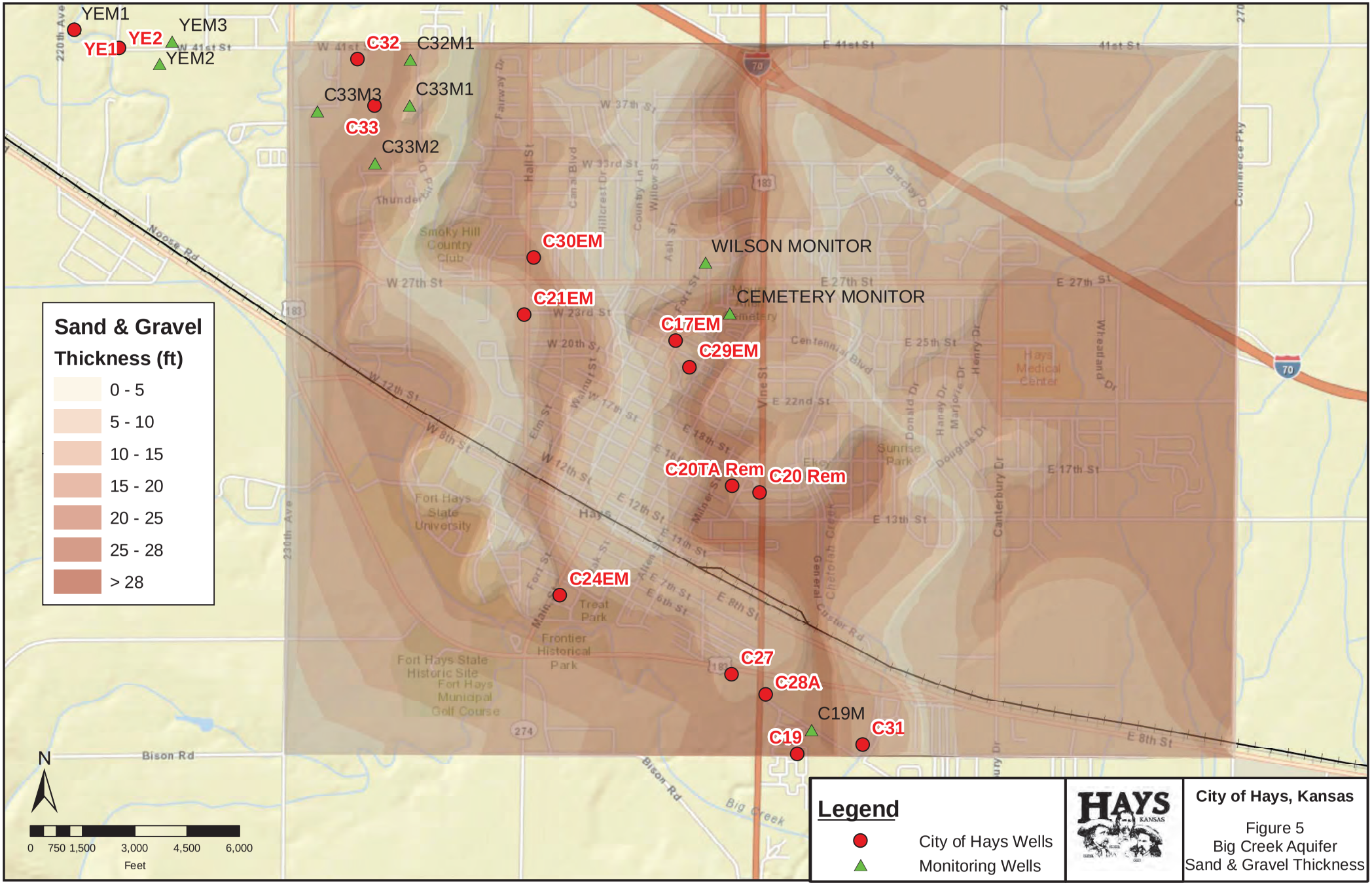
The course of Big Creek changed many times, resulting in peaks and valleys in the bedrock surface and substantial variations in grain size and discontinuous lenses of aquifer material. There is little to no transfer of water from the shale to the Big Creek aquifer; as a result the aquifer is a closed system, with precipitation and infiltration from Big Creek being the only sources of recharge. The channel also directs flow in the aquifer downstream in the subsurface in the same manner as Big Creek flowing on the surface. Therefore, water that infiltrates into the aquifer system far upstream of Hays eventually flows down to the City well field, if it is not pumped out prior to reaching the City. Upstream water use can have a significant impact on the amount of underflow entering the Big Creek Well Field area.

The highly variable bedrock topography results in significant water production challenges. Figure 4 is a bedrock surface map, illustrating the variability of the changes in the bedrock surface elevation adding to the complexity of the aquifer system. The highly variable surface has a direct impact on variations in groundwater flow, and a corresponding impact on well production. High ridges in the bedrock surface restrict or completely cut off groundwater flow if there are significant changes in the water levels within the aquifer. For this reason, calculations of the amount of water available to individual wells must include a substantial areal assessment.

Higher well yields are typically obtained from the coarser sand and gravel features. Figure 5 is a sand and gravel thickness map, illustrating the variations in the high-yield groundwater producing zones. These areas have a limited interconnection with the overlying terrace deposits, which typically consist of finer grained sands and gravels with significant lenses of silt and clay.

By comparing Figures 4 and 5, it can be seen that the areas of the aquifer with the greatest depth to bedrock, where the saturated thickness should be the greatest, do not necessarily coincide with the areas where the sand and gravel thickest and offers the greatest yield. The complex geologic environment makes it extremely difficult to evaluate the impact of lowering water levels and interference pumping between wells. High points in the bedrock or sand and gravel layers pinching out can result in impacts to one well that limit production, while other wells are unaffected. As a simplified model, an ice cube tray could represent the Big Creek aquifer where the individual compartments serve as areas with eroded bedrock filled in with water yielding aquifer material. These compartments can be interconnected in areas where the aquifer is competent but can also be poorly connected due to bedrock highs or less transmissive aquifer material such as silts and clays. Given this example, pumping in one compartment does not necessarily directly affect water levels in an adjacent compartment, however heavy production can cutoff inflow from surrounding cells resulting in faster water level declines in the producing cell.


YEM1
YE1
YE2
YEM3
YEM2
C32
C32M1
C33M3
C33M1
C33
C33M2
C30EM
WILSON MONITOR
C21EM
CEMETERY MONITOR
C17EM
C29EM
C20TA Rem
C20 Rem
C24EM
C27
C28A
C19M
C19
C31
Bedrock Elevation (ft)
1910 - 1920
1920 - 1930
1930 - 1940
1940 - 1950
1960 - 1960
1960 - 1970
1970 - 1980
1980 - 1990
>1990
N
0 700 1,400 2,800 4,200 5,600
Feet
Legend
City of Hays Wells
Monitoring Wells
HAYS
KANSAS
City of Hays, Kansas
Figure 4
Bedrock Elevation


YEM1
YE1
YE2
YEM3
YEM2
C32
C32M1
C33M3
C33M1
C33
C33M2
C30EM
WILSON MONITOR
C21EM
CEMETERY MONITOR
C17EM
C29EM
C20TA Rem
C20 Rem
C24EM
C27
C28A
C19M
C19
C31
Sand & Gravel Thickness (ft)
0 - 5
5 - 10
10 - 15
15 - 20
20 - 25
25 - 28
> 28
N
0 750 1,500 3,000 4,500 6,000
Feet
Legend
City of Hays Wells
Monitoring Wells
HAYS KANSAS
City of Hays, Kansas
Figure 5
Big Creek Aquifer
Sand & Gravel Thickness

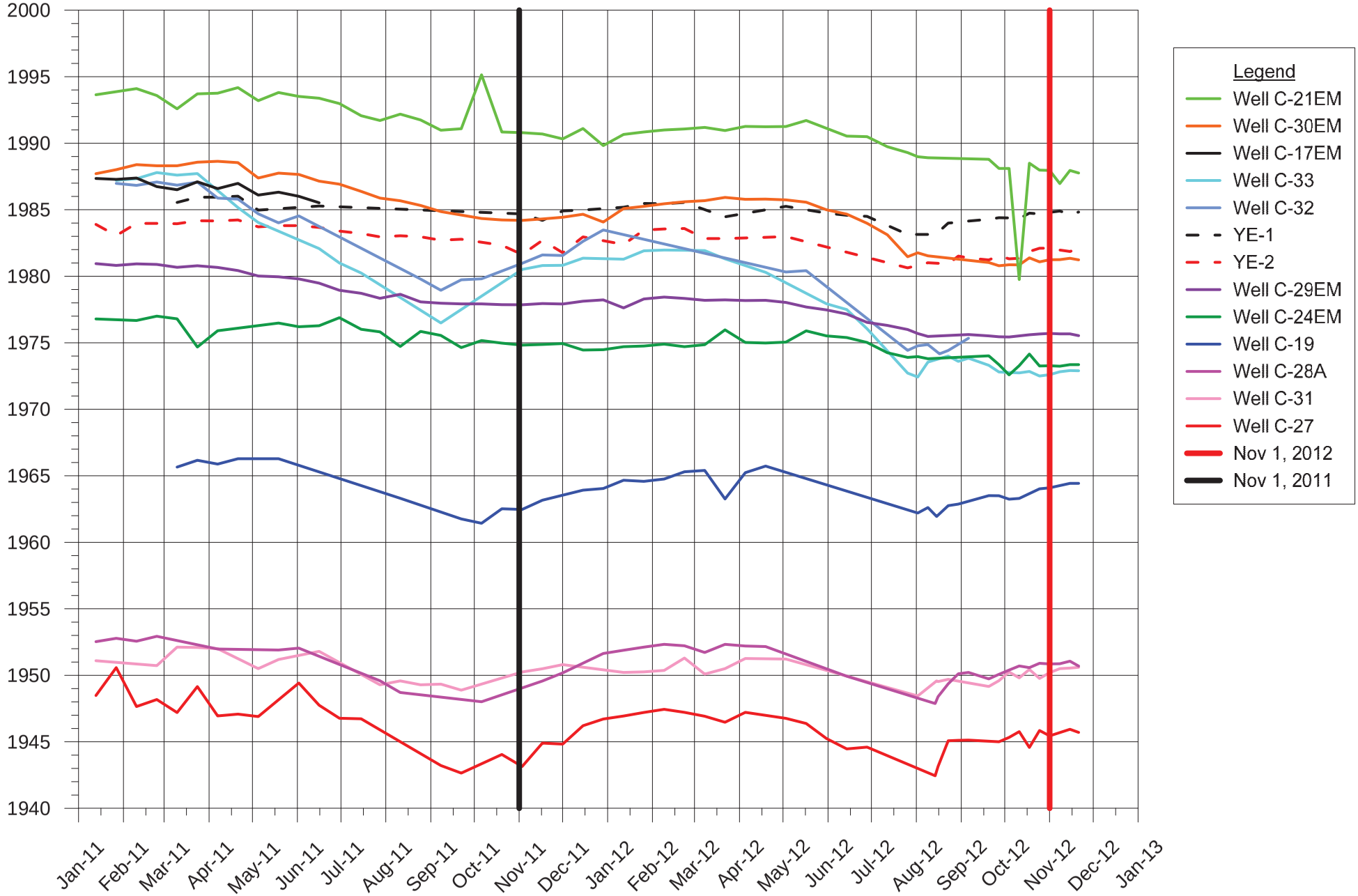
Aquifer Water Levels
Historical water level data supplied by the City was used to evaluate the water levels in the wells under static and pumping conditions. The water level data was evaluated to determine the impact of flows in Big Creek on the water levels in the aquifer, impacts of water levels on well yield, and the influence of pumping wells on each other. Groundwater flow is generally to the southeast following the alluvial channel. Hydrographs of City municipal well water levels were created that illustrate the historic trends of the aquifer water levels at the well sites. Appendix D contains water level data and hydrographs for the period from January 2011 through December 2012, showing the static water level and the pumping water level, where available, in each well.

Figure 6 is a hydrograph summarizing static water levels in all of the Big Creek wells from January 2011 through December 2012. Water levels in the wells indicate that water levels have remained fairly stable across the area. Declines can be seen in the late summer months when withdrawals are typically higher, with rebound occurring in the winter months when withdrawals are lower.

Looking at the one year interval from November 2011 to November 2012, static water levels in most wells were generally stable or actually increased slightly. Minor declines of two or three feet can be seen in Wells C-24, C-29 and C-30. More substantial declines occurred in wells C-32 and C-33. These wells are located closer to the edge of the alluvial channel, in an area where the depth to bedrock is less and with thinner sand and gravel lenses.

Aquifer Yield
The complex geologic environment has a substantial effect on the calculation of the short- and long-term yield from the aquifer. Short-term yield can be evaluated using the water level hydrographs included as Figure 6 and in Appendix D, and the pumping data supplied by the City. Based on water level data, in the short-term the aquifer is capable of yielding the volume of water the City is currently pumping from it. Water levels in most of the wells are at their typical historical levels. This annual rebound to approximately the same water level elevation is an indicator that the amount withdrawn from the aquifer does not exceed the aquifer zonal recharge which includes flow through the aquifer from upstream areas.

Evaluating the long-term yield of the aquifer is much more complex. Historic operations of the well field have not exceeded the capability of the aquifer to produce. Available tools are not capable of accurately evaluating the long-term impacts of reduced water levels in this complex geological environment. As can be seen from the cross section in Figure 2, if the drought continues and water levels drop, bedrock ridges could separate certain wells from the inflows associated with Big Creek, the primary source of aquifer recharge. At that point that well would



Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
Well Elevation Hydrographs.grf

Figure No. 6
Hays Big Creek Wells
Water Level Hydrographs
Jan 2011 to Dec 2012

be drawing water from an isolated compartment in the aquifer. This would result in much more significant declines in the water level at that specific well, while other wells might still be unaffected. Conversely, when the drought subsides and aquifer water levels begin to rise again, it will take more time for that particular well to recover, as the aquifer water levels would have to rise above the top of the ridge before they would begin refilling that compartment. The available documentation of the historic operation of the well field does not include data indicating where the geologic boundaries begin to impact individual wells.

Another factor complicating the calculation of the long-term yield of the aquifer is that the amount of water withdrawn from the aquifer system by domestic well users is unknown. The locations of the registered domestic wells (Figure 3) shows that the highest concentration of domestic wells are in with the areas where the City wells are seeing the greatest declines in water levels. If the drought causes the domestic well users to increase the amount of water they are pumping, and recharge is not available to resupply the aquifer, the rate of water level declines could increase.

Setting operational triggers based on aquifer water levels is therefore very subjective in the Big Creek aquifer. Without historical data indicating a specific point when water levels will begin to decline at critical rates, or an accurate three-dimensional groundwater flow model of the aquifer to determine those levels, the City's ongoing tracking of the water levels in the City wells is the best current technique for identifying triggers. An aquifer management plan identifying key water levels and rate of change is necessary for adequate monitoring of the resource.

Well Field Infrastructure Evaluation

City Well Conditions

Data from the City's files and the well step tests were used to evaluate the well condition and efficiency. In general the wells are located in higher yielding areas of the aquifer and well conditions were very good due to on-going maintenance efforts and careful tracking and interpretation of well operational data. Data including static water levels, pumping water levels and flow rates are regularly recorded and evaluated by City staff to ensure the wells are operating in an efficient manner

Well efficiencies were calculated for each well using the Rorabaugh method for analysis. This method uses the flow rate and change in drawdown in the pumped well and is effective where there are not observation wells available nearby. Efficiency is calculated by analyzing the flow rate and drawdown of each step of the pumping test, and graphically comparing the theoretical drawdown to the observed drawdown. This effectively determines the efficiency of the wells connection to the aquifer.

As can be seen from Table 2 the City's wells are highly efficient. This is a result of effective maintenance and rehabilitation efforts, and closely monitoring the operational characteristics of the wells. The rule of thumb is that wells should not be allowed to degrade over time to less than 60% efficiency. If well efficiencies are allowed to drop below 60%, rehabilitation efforts typically will be less effective and may not return the well to 100% efficiency. This typically results in more rapid degradation of the well, requiring more frequent maintenance and eventually shortens the operational life of the well.

Table 2. Well Efficiency.

Well No.	Specific Capacity *(gpm/ft)*	Efficiency
C-19	23.5	97.4%
C-27	31.2	96.3%
C-28A	25.8	96.9%
C-31	14.8	99.6%
C-32	22.0	96.3%
C-33	18.7	98.2%
YE-1	5.4	99.7%
YE-2	26.3	96.3%

Raw Water System

The raw water system for Hays delivers the water from the SHRWF, Dakota Wells and ten of the Big Creek Wells to the WTP. Raw water lines extend around the west and south portions of the City as shown in Figure 1, and then extend to the south along Highway 183 to the Dakota wells and SHRWF. There is a total of approximately 225,473 feet of piping in the raw water system, comprised of the following:

- ~45,580 feet of 20-inch pipe;
- ~45 feet of 18-inch pipe;
- ~40,768 feet of 16-inch pipe;
- ~630 feet of 14-inch pipe;
- ~73,636 feet of 12-inch pipe;
- ~24,097 feet of 10-inch pipe;
- ~19,137 feet of 8-inch pipe;
- ~13,560 feet of 6-inch pipe; and
- ~8017 feet of 4-inch pipe.

A numerical network analysis model was used in this study to evaluate the raw water system piping. WaterCAD by Bentley was used to complete this analysis. This program analyzes steady state flows and pressures for pipe distribution system. The pipe network model of the distribution system is based on a numbering system for each pipe segment and node. Information for each pipe includes length, beginning node, ending node, Hazen Williams C-value, and pipe diameter. Information for each node includes ground elevation, water demand, and x and y coordinates. Wells and pumps were also included in the model.

Analysis of the Hays raw water system indicates that the system has adequate capacity for connection of additional wells. The model can be used as a tool to locate future connections to the system and determine the hydraulics for pipeline and pump sizing. As additional capacity is added, the model can be updated to provide an operational tool for monitoring changing well and pump conditions, as well.

System Improvements

Well Replacement & Relocation

A select number of the Big Creek wells are in need of relocation due to impacts from the contaminant plume or operational concerns. Well C-17 is located next to a residence and is currently disconnected from the system. In addition, the well is 62 years old, which exceeds the typical design life for a well by 12 years. This makes it impractical to spend additional funds on reconnecting the well to the system for use as an emergency well or connecting the well to the raw water system. This well should be abandoned in accordance with Kansas state regulations and a new well drilled.

Wells C-20 and C-20TA are operating under a term water right provided in support of the remediation efforts associated with the groundwater plume under the center of Hays. In the most recent remediation effort update issued by KDHE, a map of the PCE plume indicates that contamination extends approximately two miles south-southeast from 26th street and Vine street (Appendix E). Wells C20 and C-20TA currently operate continuously, but the remediation efforts will eventually reach a point where the pump-and-treat system is shut down. At that time the term permit will no longer be in place, and the wells will be located in an area that may be considered contaminated. A discussion with the Kansas Department of Health and Environment would be required to determine if they would have concerns about permitting a well for municipal use without a remediation system. In the event that KDHE is willing to permit the wells for further municipal use, it would be an opportunity to transfer a permanent water right from an emergency well, providing a permanent point of diversion that is connected to the raw water system.

Well C-21 is a priority for relocation based on water levels and age. The City owns property approximately one-half mile to the west of C-21 that is a potential site for a well. While this site is closer to Big Creek, it also appears to be on a bedrock high with limited practical sand and gravel thickness. Further exploratory drilling would be required to verify the site specific geology and aquifer characteristics prior to constructing a well.

Well C-24 is a candidate for relocation that could be connected relatively easy to the raw water system. C-24 is located near the pool at 4th Street and Main, and could be relocated to the east onto property that is owned by the City, or property owned by the State of Kansas or the Kansas State University and Extension Office. A pipeline could then beextended southward along the east side of the levee and connecting to the raw water lines.

An additional consideration when planning for relocation of the emergency wells is the water supply for the golf course. Currently, effluent from the wastewater plant is supplied to the golf course for irrigation purposes. The effluent contains sodium and chloride concentrations that are higher than the desired concentrations for optimum plant growth. If adequate precipitation does not flush the sodium out of the soil, grass and plant growth will be inhibited. To assist with dilution of the sodium and chloride concentrations, one or more of the emergency wells could be plumbed into the wastewater effluent line supplying the golf course. The water from the emergency well could then be blended with the effluent to reduce the sodium and chloride concentrations.

We thank the City of Hays for the opportunity to be of assistance. If you have any questions regarding this study, please do not hesitate to contact Brian (316-941-3921) (bmeier@burnsmcd.com) or Paul (816-823-7168) (pmccormick@burnsmcd.com).

Sincerely,
BURNS & MCDONNELL

Brian J. Meier
Project Director

Paul A. McCormick, P.E.
Associate Geological Engineer

Appendix A

IGUCA Documentation

800 E. First St. • Suite 400 • Wichita, KS 67202-2798
Tel: 316 941-3921 • Fax: 316 941-4730 • www.burnsmcd.com

STATE OF KANSAS }
ELLIS COUNTY }
This instrument was filed for record
JUL 25 1985
8:00 o'clock A M recorded in
353 of Misc page 157
Fees 12.00 Register of Deeds
MICROFILMED

DIVISION OF WATER RESOURCES, STATE BOARD OF AGRICULTURE
RECEIVED
SEP 25 1985

DIVISION OF WATER RESOURCES, STATE BOARD OF AGRICULTURE
RECEIVED
JUL 31 1985

STATE OF KANSAS
DIVISION OF WATER RESOURCES
KANSAS STATE BOARD OF AGRICULTURE
TOPEKA, KANSAS

BEFORE

DAVID L. POPE, CHIEF ENGINEER-DIRECTOR
DIVISION OF WATER RESOURCES
KANSAS STATE BOARD OF AGRICULTURE

IN THE MATTER OF THE DESIGNATION OF
AN INTENSIVE GROUNDWATER USE CONTROL AREA
IN HAYS, KANSAS, AND THE IMMEDIATE AREA

The Chief Engineer-Director, Division of Water Resources, Kansas State Board of Agriculture, after having given due consideration to evidence, testimony and other information presented to him at, or as a result of, the hearing held in Hays, Kansas, on May 30, 1985, regarding the proposed designation of the City of Hays, Kansas, and the immediate area, as an intensive groundwater use control area, makes the following findings, conclusions and order:

FINDINGS

1. That by letter dated February 15, 1985, Mr. Ken Carter, city manager, City of Hays, informed David L. Pope, Chief Engineer-Director, Division of Water Resources (hereinafter referred to as the "Chief Engineer"), that at a regular meeting of the city commission of the City of Hays on February 14, 1985, a motion was unanimously passed requesting the Division of Water Resources (hereinafter referred to as the "DWR"), to initiate proceedings to designate an intensive groundwater use control area in the City of Hays and in a small area surrounding the city; that the purpose for the request was designed to "solely" address the issue of private water wells and their usage for outside discretionary activities.
2. That in February 1985, based upon information in the files of the office of the Chief Engineer, it appeared that preventable waste of water was occurring, or may occur, within the area in question and other conditions existed within the area in question which required regulation in the public interest.
3. That in accordance with the provisions of K.S.A. 82a-1036 through K.S.A. 82a-1040, the Chief Engineer may upon his own initiative, initiate proceedings for designation of an intensive groundwater use control area (hereinafter referred to as a "control area") whenever he or she has reason

to believe that preventable waste is occurring, or may occur within an area, or conditions exist within an area in question which require regulation in the public interest.

4. That on February 26, 1985, the Chief Engineer issued a findings and order initiating the proceedings for designation of a control area within the City of Hays and the immediate area; the immediate area is defined to mean that area outside the corporate limits of the City of Hays and within the area described below:

> That part of Section 20, Township 13 South, Range 18 West lying East of Highway 183 Alternate and South of Interstate 70;
>
> Those parts of Sections 21, 26, 27 and 28, Township 13 South, Range 18 West, lying South of Interstate 70;
>
> The West one half of Section 35, Township 13 South, Range 18 West;
>
> The West one half of Section 2, Township 14 South, Range 18 West;
>
> All of Section 3, Township 14 South, Range 18 West;
>
> Those parts of Sections 4 and 5, Township 14 South, Range 18 West lying North of Highway 183 Alternate;
>
> Those parts of Sections 29 and 32, Township 13 South, Range 18 West lying East of Highway 183 Alternate;
>
> all in Ellis County, Kansas,

a total of 9.9 square miles, more or less.

5. That on April 25, 1985, notice of hearing was sent to every water right holder of record and all known landowners within the boundaries of the proposed control area but outside of the corporate boundaries of the City of Hays. Notices were also sent to the Kansas Register, The Hays Daily News, and various governmental officials, state agencies, and members of the Kansas Water Authority. Notice of hearing was also sent to all customers of water, sewage and refuse services of the City of Hays. The notice stated that a public hearing would be held at 9:00 a.m. on Thursday, May 30, 1985, at the Auditorium of the Fort Hays State University Experiment Station, Hays, Kansas, at which time all interested parties would have an opportunity to be heard regarding the proposed designation of a control area.

6. That on May 30, 1985, a public hearing was held at the time and place set forth in the notice of hearing.

7. That Laren Dinkel, Water and Sewer Plant Superintendent for the City of Hays (hereinafter referred to as "the city"), testified that he had heard

an estimate made of the number of private water wells in the city as being around 1,500 in 1978 or 1979; that Mr. Dinkel also testified that the city obtains its water from well fields in the Smoky Hill River Basin and Big Creek Basin.

8. That Leo Wellbrock, Public Works Director for the city, testified that the current water problem facing the city is to meet demand rates with the available supply; that during the last eight to ten years the city has had problems meeting demands during hot dry weather periods; that the problem has increased since May 1984 when the DWR declared an intensive groundwater use control area in the Smoky Hill River Basin which reduced the amount of water the city could pump from its wells in that basin.

9. That Mr. Wellbrock testified that on a continual basis he has observed evidence of waste of water such as water flowing along street gutters, water sprinklers being adjusted to include driveways, sidewalks, and at times even the street surfaces, lawns being watered during rain periods or shortly after a sufficient rainfall, watering of lawns on a daily basis and during times of extreme heat and the washing of vehicles with hose running wide open.

10. That Mr. Wellbrock read a letter dated April 11, 1985 from Terrence L. Mannell, Ellis County Extension Horticulture Agent, addressed to Ken Carter, City Manager, concerning lawn irrigation; that Mr. Mannell's letter stated that frequency of watering, the amount of water applied, and the time of day the lawn is watered all play an important part in both managing a healthy lawn and conserving water; that said letter stated that one inch of water per week during the summer is the requirement for cool-season grasses such as bluegrass and fescue; that a good soaking once a week will develop a good lush lawn with good drought tolerance, that frequent shallow irrigation not only causes a poor rooted turf, but wastes water, and that the morning hours from 5:00 a.m. to 10:00 a.m. are ideal for lawn irrigation to maintain a healthy lawn and conserve water.

11. That Mr. Wellbrock also testified that he has no way of knowing whether the outside waste of water was due to private water wells or the city system; that the city has no records of who has private water wells.

12. That Ken Carter, City Manager, testified that residential water use peaks during the four summer months when people would be doing such things as outside lawn watering, washing cars, and watering shrubs and trees; that

the peak is higher during the summer in years when annual precipitation is lower.

13. That Mr. Carter also testified that the city does not presently have any regulation concerning private water wells; that he did not know how many private water wells were within the city but that he had heard estimates of from 500 to 2,500; that while the city has authority to regulate and control water users on the city water system, it has no authority over private water wells.

14. That Mr. Carter testified that the reason the City Commission requested the control area was that it would have to impose some pretty stringent conservation measures to live within the limitations on its Smoky Hill River Basin well field and that if two individuals live side-by-side and one is on city water and the other has a private water well, it could enforce its regulations against the city water user but could not do anything to the one with the private water well; that the commission felt as a matter of fairness and equity private water wells should also be regulated.

15. That Mr. Carter testified that the City Commission has been working on a water conservation plan, a draft of which was submitted for the record.

16. That Mr. Carter testified that it would be helpful for the city in enforcing its conservation plan if it knew where the private water wells were located.

17. That James Bagley, an engineer on the staff of the DWR, testified that according to records the DWR obtained from the Kansas Department of Health and Environment, a total of 356 water wells had been reported as having been drilled within the boundaries of the proposed control area from 1974 through 1984.

18. That a publication of the Kansas State University Cooperative Extension Service entitled "Watering Your Lawn" was submitted for the record; that said publication states that early morning is the best time to water lawns because the cool air temperature makes it the most efficient time from a water use standpoint and wind is least likely to alter the distribution pattern, and that the disadvantages of mid-day watering are that evaporation is greatest and strong winds are more likely.

19. That Neil DeWerff, Greens Superintendent at the Smoky Hill Country Club, testified that said country club has bluegrass fairways and that most of the watering is done at night; that it is not feasible to soak the golf course down one day a week; that it is better to water nightly and use a

lighter irrigation to avoid problems of compaction and runoff; that the maximum amount of water applied to the fairways is about one-sixth of an inch per night, or a total of one and one-sixth of an inch per week; that the greens take a little more water and that they are watered only at night.

20. That John Ratzlaff testified that he believes time of day lawn watering restrictions, such as no watering between 12:00 noon and 7:00 p.m., would be a step in the right direction and that such restriction should apply to every water user, including private water well owners; that he also testified that, on the basis of a statistical study of evaporation which he conducted, the amount of evaporation which occurs when the maximum temperature is 100 degrees Fahrenheit is about three times the amount when the maximum temperature is 70 degrees Fahrenheit; that in addition, when humidity is low and wind speed is relatively high, the increase in evaporation can be much greater.

21. That James Bieker, owner of Kraus Pump and Supply, testified that there was very easily 2,000 or more private water wells in the city in his opinion; that his company has drilled close to 100 domestic wells in the Hays area since last year and part of this year.

22. That Anthony P. Bollig testified that he thought the city should pass an ordinance that water should not be allowed to run down the streets whether from private wells or the city system and that there be no watering after 12:00 noon; that private well owners should be left alone, except the ones wasting water.

23. That Mel Karst, President of Karst Water Well Drilling in Hays, testified that his company had drilled hundreds of wells in the Hays area and serviced hundreds more; that last year his company drilled nearly 100 wells in the Hays area and that there are probably more being drilled than are reported to the Kansas Department of Health and Environment because private individuals can drill them with little hand rigs; that he estimated there are 1,500 wells in the city now.

24. That the following individuals testified that they were essentially opposed to the control area: Darrell G. Seibel, Dave Brown, Jim Tuttle, James Bieker, JoAnn Jennings, Marcellus Schmidt, Brent Spaulding, Ozie Meckel, Mel Karst, and the Smoky Hill Country Club; that the reasons given for opposing the control area included: it would reduce the market value of

development properties, it would adversely affect certain businesses, private wells are helping reduce the demand on the city system, other alternatives should be considered first, unnecessary government regulation should be avoided, and the state already regulates the wells at the Smoky Hill Country Club.

25. That the Chief Engineer directed that the formal record of the proceeding would remain open for a period of ten days following the hearing so that anyone who wished could submit additional data or statements for the record.

26. That a letter dated May 31, 1985 from Dave Van Doren, President of Van Doren Industries, Inc. in Hays, was received in the office of the Chief Engineer on June 5, 1985; that Mr. Van Doren's letter stated that if private water wells were limited to the number of days they may be used for irrigation, it may cause a real hardship on a few households in Hays which use water-cooled compressor-type air conditioners or heat pumps where the water which exits the air conditioner is not returned to the aquifer but rather is sprinkled upon the lawn; that therefore he requested that an exception be made for those situations if limitations were imposed on all water users in the proposed control area.

27. That K.S.A. 82a-705a provides in pertinent part:

> "The use of water for domestic purposes instituted subsequently to June 28, 1945, to the extent that it is beneficial, shall constitute an appropriation right. The chief engineer, however, may require any person using water for any purpose to furnish information with regard to such use thereof."

CONCLUSIONS

1. That there is inadequate information on the number and locations of domestic water wells within the proposed control area, and that the locations and uses of all domestic water wells within said area should be determined.

2. That conditions exist within the proposed control area that require regulation in the public interest.

3. That watering of lawns, gardens, trees, shrubs and other similar outdoor vegetation at a time when high temperatures, strong winds and high solar radiation exist causes excessive evaporation which is considered to be preventable waste.

4. That an intensive groundwater use control area should be established within the area as set forth in Finding No. 4.

ORDER

NOW, THEREFORE, It is the decision and order of the Chief Engineer-Director, Division of Water Resources, Kansas State Board of Agriculture, that an intensive groundwater use control area should be and is hereby established within the area set forth below, and the following corrective control provisions shall be in full force and effect within the area described from and after the date of this Order:

1. The area to which this order relates is the area within the corporate boundaries of the City of Hays, Kansas and the immediate area. The immediate area is defined to mean that area outside the corporate limits of the City of Hays and within the area described below:

   That part of Section 20, Township 13 South, Range 18 West lying East of Highway 183 Alternate and South of Interstate 70;

   Those parts of Sections 21, 26, 27 and 28, Township 13 South, Range 18 West, lying South of Interstate 70;

   The West one half of Section 35, Township 13 South, Range 18 West;

   The West one half of Section 2, Township 14 South, Range 18 West;

   All of Section 3, Township 14 South, Range 18 West;

   Those parts of Sections 4 and 5, Township 14 South, Range 18 West lying North of Highway 183 Alternate;

   Those parts of Sections 29 and 32, Township 13 South, Range 18 West lying East of Highway 183 Alternate;

   all in Ellis County, Kansas,

   a total of 9.9 square miles, more or less, which includes that area within the corporate limits of the City of Hays, Kansas.

2. That all domestic water wells in existence at the time of this Order within the control area shall be registered with the office of the Chief Engineer-Director on or before August 5, 1985 or within any authorized extension of time thereof. That all domestic water wells which may be constructed within the control area after the date of this Order shall be registered with the office of the Chief Engineer-Director within 30 days of the date of completion of the same. Water wells within the control area which are authorized by a vested right order or a permit to appropriate water for beneficial use are considered to be registered within the meaning of this section.

3. That the use of registered water wells shall not be subject to the mandatory provisions of any water conservation plan adopted by the City of Hays, except as provided in paragraph 4 below. That the use of water wells which have not been registered as set forth in paragraph 2 above shall be subject to the mandatory provisions of any water conservation plan properly adopted by the City of Hays, and approved by the Chief Engineer-Director, until such time as they are registered.

4. That the Chief Engineer-Director reserves the right to ban, or allow the City of Hays to ban, the use of wells to water lawns, gardens, trees, shrubs and other similar outdoor vegetation during the hours of 12:00 noon through 7:00 p.m. daily from June 1 through September 30 inclusive each year, should information show that well users are not voluntarily avoiding the watering of such vegetation during times of high temperature, strong winds and high solar radiation which results in the occurrence of preventable waste of water.

5. That the Chief Engineer-Director specifically retains jurisdiction in this matter with authority to make such changes in the boundaries of the intensive groundwater use control area or the corrective control provisions which have been instituted or any other provisions of this Order, and to hold any subsequent hearings in the matter of the control area or the corrective control provisions, which he or she may deem to be in the public interest.

Dated at Topeka, Kansas, this 3rd day of July, 1985.

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER DIRECTOR
KANSAS STATE BOARD of AGRICULTURE

David L. Pope

David L. Pope, P.E.
Chief Engineer-Director
Division of Water Resources
Kansas State Board of Agriculture

State of Kansas)
) SS
County of Shawnee)

The foregoing instrument was acknowledged before me this 3rd day of July, 1985, by David L. Pope, P.E., Chief Engineer-Director, Division of Water Resources, Kansas State Board of Agriculture.

DENISE J. WATERS
NOTARY
STATEWIDE
PUBLIC
SHAWNEE COUNTY, KANSAS

Denise J. Waters
Notary Public

My appointment expires: March 1, 1986

DIVISION OF WATER RESOURCES, STATE BOARD OF AGRICULTURE. RECEIVED SEP 25 1985

DAVID L. POPE, CHIEF ENGINEER-DIRECTOR
DIVISION OF WATER RESOURCES
KANSAS STATE BOARD OF AGRICULTURE

STATE OF KANSAS }
ELLIS COUNTY }
This instrument was filed for recor
SEP 16 1985
8:00 o'clock A M recorded in
Book 354 of 096 page 251
Fees 15.00 Register of Deeds
MICROFILMED

AMENDED ORDER

IN THE MATTER OF THE DESIGNATION OF AN INTENSIVE GROUNDWATER USE CONTROL AREA IN HAYS, KANSAS, AND THE IMMEDIATE AREA

The Chief Engineer-Director, Division of Water Resources, Kansas State Board of Agriculture, (hereinafter referred to as the "Chief Engineer"), after due consideration makes the following findings and order.

FINDINGS

1. That on July 3, 1985, the Chief Engineer issued an order designating an intensive groudwater use control area in Hays, Kansas, and the immediate area.

2. That on July 30, 1985, an action was filed in the District Court of Ellis County, Kansas, alleging that the Order of the Chief Engineer dated July 3, 1985, was unlawful or failed to follow prescribed procedures in that the Order purported to grant powers to the City of Hays, Kansas, to control activities in a geographical area that extends beyond its corporate limits and jurisdiction.

3. That the Chief Engineer did not intend to grant powers to the City of Hays, Kansas, to control any activities in a geographical area that extends beyond its corporate limits and jurisdiction.

4. That paragraph 3 of the Order of the Chief Engineer dated July 3, 1985 stated:

   3. That the use of registered water wells shall not be subject to the mandatory provisions of any water conservation plan adopted by the City of Hays, except as provided in paragrapoh 4 below. That the use of water wells which have not been registered as set forth in paragraph 2 above shall be subject to the mandatory provisions of any water conservation plan properly adopted by the City of Hays, and approved by the Chief Engineer-Director, until such time as they are registered.

5. That paragraph 4 of the Order of the Chief Engineer dated July 3, 1985 stated:

   4. That the Chief Engineer-Director reserves the right to ban, or allow the City of Hays to ban, the use of wells to water lawns, gardens, trees, shrubs and other similar outdoor vegetation during the hours of 12:00 noon through 7:00 p.m. daily from June 1 through September 30 inclusive each year, should information show that well users are not voluntarily avoiding the watering of such vegetation during times of high temperature, strong winds and high solar radiation which results in the occurrrence of preventable waste of water.

Ks St. Board of Agriculture
DIVISION OF WATER RESOURCES
DAVID L. POPE, Chief Engineer-Director
109 SW Ninth Street, Suite 202
TOPEKA, KANSAS 66612-1283 (Enew)
(913) 296-3717

6. That paragraph 5 of the Order of Chief Engineer dated July 3, 1985 stated:

> 5. That the Chief Engineer specifically retains jurisdiction in this matter with authority to make changes within the boundaries of the intensive groundwater use control area or the corrective control provisions which have been instituted or any of the provisions of this Order, and to hold any subsequent hearings in the matter of the control area or the corrective control provisions, which he or she may deem to be in the public interest.

ORDER

NOW THEREFORE, it is the decision and order of the Chief Engineer that paragraphs 3, 4 and 5 of the Order of the Chief Engineer dated July 3, 1985, should be stricken and the following numbered paragraphs substituted therefore:

3. That the use of registered water wells, within the City of Hays, shall not be subject to the mandatory provisions of any water conservation plan adopted by the City of Hays.

4. That the use of water wells, within the City of Hays which have not been registered as set forth in paragraph 2 above, shall be subject to the mandatory provisions of any water conservation plan properly adopted by the City of Hays, and approved by the Chief Engineer, until such time as they are registered.

5. That the use of water wells, which are outside the City of Hays but within the boundaries of the intensive groundwater use control area and which have not been registered as set forth in paragraph 2 above, shall be subject to provisions indentical to any mandatory provisions of any water conservation plan properly adopted by the City of Hays, and approved by the Chief Engineer, until such time as the wells are registered.

6. That the Chief Engineer reserves the right to ban the use of any water well, within the boundaries of the intensive groundwater use control area, to water lawns, gardens, trees, shrubs and other similar outdoor vegetation during the hours of 12:00 noon through 7:00 p.m. daily from June 1 through September 30 inclusive each year, should information show that well users are not voluntarily avoiding the watering of such vegetation during times of high temperature, strong winds and solar radiation which results in the occurrence of preventable waste of water.

7. That this order neither authorizes nor recognizes any water conservation plan, presently or subsequently, adopted by the City of Hays, until the plan is approved by the Chief Engineer.

8. That the Chief Engineer specifically retains jurisdiction in this matter with authority to make changes within the boundaries of the intensive groundwater use control area or the corrective control provisions which have been instituted or any of the provisions of this Order, and to hold any subsequent hearings in the matter of the control area or the corrective control provisions, which he or she may deem to be in the public interest.

9. That the remainder of the Order of the Chief Engineer dated July 3, 1985, not in conflict with paragraphs 3 through 8 above, shall remain in effect.

Dated at Topeka, Kansas this 29th day of August, 1985.

DIVISION OF WATER RESOURCES
DAVID L. POPE
CHIEF ENGINEER DIRECTOR
KANSAS STATE BOARD of AGRICULTURE

David L. Pope, P.E.
Chief Engineer-Director
Division of Water Resources
Kansas State Board of Agriculture

State of Kansas)
)
County of Shawnee)

The foregoing instrument was acknowedged before me this 29th day of August, 1985, by David L. Pope, P.E., Chief Engineer-Director, Division of Water Resources, Kansas State Board of Agriculture.

DENISE J. WATERS
NOTARY
STATEWIDE PUBLIC
SHAWNEE COUNTY, KANSAS

Notary Public

My appointment expires: March 1, 1986

Appendix B

Non-City Permitted Water Rights

Active Non-City Water Rights Near the City of Hays

Big Creek Alluvial Aquifer, Hays Kansas

FILE NUMBER	Use	PRIORITY	TWP	RNG	SECT	FT NORTH	FT WEST	Q3	Q2	Q1	WELLS	GIS_LONG	GIS_LAT	2011_AF_USED	AUTH_QUANT	AUTH_RATE	OWNER
29327	CON	23-MAR-2011	14	18	3	3400	4720	NW	SW	NW	1	-99.315769	38.865857	0.00	97.00	60	THE DOW CHEMICAL COMPANY
29327	IRR	12-APR-1976	13	18	29	2440	1580	NE	NW	SE	1	-99.341489	38.892182	56.17	71.00	130	SMOKY HILL COUNTRY CLUB INC
29233	IRR	12-APR-1976	13	18	29	2440	1780	NE	NW	SE	1	-99.342191	38.892182	29.04	71.00	125	SMOKY HILL COUNTRY CLUB INC
29327	IRR	26-JUN-1980	13	18	29	3490	1650	NE	SW	NE	0	-99.341735	38.895065	25.90	61.40	70	SMOKY HILL COUNTRY CLUB INC
35753	IND	14-DEC-1956	14	18	4	0	0	SW	NE	NE	1	-99.321045	38.868240	0.00	52.00	240	MIDWEST ENERGY - HAYS
35754	IND	14-DEC-1956	14	18	4	0	0	SE	NE	NE	1	-99.318741	38.868248	0.00	52.00	240	MIDWEST ENERGY - HAYS
48046	IRR	21-AUG-1956	13	18	30	0	0	NW	NE	SE	1	-99.357490	38.891190	15.57	38.50	268	NORTH FORK INVESTMENTS INC
37187	MUN	16-NOV-1981	14	18	3	60	1097	SW	SE	SE	1	-99.303020	38.856530	0.00	35.63	43	SUNSET VALLEY ESTATES LLC
34296	IND	30-APR-1984	14	18	3	1395	300	SE	NE	SE	3	-99.300248	38.860363	0.00	30.69	90	CROSS MANUFACTURING INC
37198	MUN	03-NOV-1983	13	18	32	3793	3385	NW	SE	NW	1	-99.347919	38.881309	0.00	28.54	100	MEADOW ACRES MOBILE HOME PARK
13136	IRR	08-SEP-1980	13	18	29	1100	1900	NE	SW	SE	1	-99.342598	38.888503	58.36	26.50	85	SMOKY HILL COUNTRY CLUB INC
37165	IRR	08-SEP-1980	13	18	29	750	1900	NE	SW	SE	1	-99.342595	38.887542	26.93	26.50	85	SMOKY HILL COUNTRY CLUB INC
37117	IRR	18-OCT-1956	13	18	30	0	0	NW	NW	SE	1	-99.362450	38.891678	8.85	20.00	233	HILGERS
37196	IND	26-JUN-1980	14	18	2	1307	3300	CS	NE	SW	1	-99.292650	38.860420	0.83	18.60	31	WAFFLE-CRETE BUILDING SYSTEMS
20119022	MUN	15-MAR-1977	14	18	11	4750	2838	NE	NE	NW	1	-99.290960	38.855080	2.76	18.38	26	BUFFALO HILLS PARK
31252	MUN	15-MAR-1977	14	18	11	5180	3696	NW	NE	NW	1	-99.293810	38.856320	0.00	18.38	26	BUFFALO HILLS PARK
6487	MUN	16-NOV-1981	14	18	3	60	1297	SW	SE	SE	1	-99.303410	38.856550	0.00	16.60	43	SUNSET VALLEY ESTATES LLC
6487	IRR	27-OCT-1980	14	18	2	5000	4760	NW	NW	NW	4	-99.297282	38.870124	3.55	14.80	165	UNIFIED SCHOOL DISTRICT #489 HAYS
37197	IRR	27-OCT-1980	14	18	2	4760	4700	NW	NW	NW	4	-99.297073	38.869468	3.10	14.80	165	UNIFIED SCHOOL DISTRICT #489 HAYS
34636	IRR	27-OCT-1980	14	18	2	5100	4536	NE	NW	NW	4	-99.296496	38.870402	3.07	14.80	165	UNIFIED SCHOOL DISTRICT #489 HAYS
34636	IRR	27-OCT-1980	14	18	2	4800	4520	NE	NW	NW	4	-99.296441	38.869580	1.20	14.80	165	UNIFIED SCHOOL DISTRICT #489 HAYS
34636	IRR	27-OCT-1980	14	18	2	4800	4600				4	-99.296722	38.869579	0.00	14.80	165	UNIFIED SCHOOL DISTRICT #489 HAYS
34636	MUN	15-MAR-1977	14	18	11	3996	3432	SW	NE	NW	1	-99.293210	38.853820	7.32	13.99	42	BUFFALO HILLS PARK
34636	IRR	09-JAN-1978	13	18	32	1230	2190	NW	SW	SE	1	-99.343721	38.874272	11.55	11.70	91	FORT HAYS STATE UNIVERSITY
35130	MUN	08-MAR-1977	14	18	11	5180	3975	NE	NW	NW	1	-99.294755	38.856141	12.72	5.83	26	CASTILLO
20751	IRR	06-APR-1967	14	18	4	2010	4150	NE	NW	SW	1	-99.332380	38.862320	1.87	5.80	95	AGRICULTURAL RESEARCH CENTER - HAYS
20751	DOM	15-DEC-1979	13	18	19	280	1450	SE	SW	SE	1	-99.359469	38.900595	0.00	3.93	25	MECKENSTOCK
20751	DOM	04-JAN-1979	13	18	30	5100	1640	NE	NW	NE	1	-99.360192	38.899358	0.00	3.84	20	DREILING
31252	DOM	26-JUN-1991	13	18	30	5100	1830	NE	NW	NE	1	-99.360856	38.899359	0.00	3.84	25	CLAYCAMP
45499	DOM	01-JAN-1979	13	18	19	390	1620	SE	SW	SE	1	-99.360067	38.900897	0.00	3.84	20	PFEIFER
36853	DOM	01-JAN-1979	13	18	19	920	1220	NW	SE	SE	1	-99.358659	38.902353	0.00	3.84	25	HERL TRUSTS
42442	IRR	09-JAN-1978	14	18	5	3985	520				2	-99.338146	38.867523	0.00	3.65	77	FORT HAYS STATE UNIVERSITY
34519	IRR	07-APR-2003	13	18	32	2843	809	SW	SE	NE	1	-99.338871	38.878701	3.58	3.50	40	THOMAS MORE PREP MARIAN
42787 -01	DOM	05-MAY-1997	13	18	29	764	4349	NE	SW	SW	0	-99.351217	38.887581	0.00	3.50	30	MACDONALD REV LIVING TRUST
34518	DOM	18-OCT-1978	13	18	19	925	1150	NW	SE	SE	1	-99.358413	38.902367	0.00	3.41	25	GREEN
5907	IRR	11-JUN-1973	13	18	32	661	1085	NW	SE	SE	1	-99.339840	38.872710	0.00	3.07	65	FORT HAYS STATE UNIVERSITY
6202	DOM	01-MAY-1985	13	18	19	280	2530	SW	SW	SE	1	-99.363267	38.900595	0.00	2.98	15	REIN
26466	DOM	31-DEC-1981	13	18	19	315	1060	SW	SE	SE	1	-99.358098	38.900691	0.00	2.98	25	LEIKER
26466	DOM	06-AUG-1985	13	18	19	440	2090	SW	SW	SE	1	-99.361719	38.901034	0.00	2.98	25	BEMIS
26466	MUN	27-DEC-1977	14	18	11	3750	4050	NE	SW	NW	1	-99.295006	38.852211	0.00	2.64	30	CASTILLO
34295	IRR	11-MAR-1981	14	18	3	5214	2113				1	-99.306760	38.870820	0.21	2.55	35	HAYS HOUSING AUTHORITY
34121 -01	IRR	19-MAR-1984	14	18	2	2800	3500	SW	SE	NW	1	-99.292869	38.864110	2.50	2.50	30	UNIFIED SCHOOL DISTRICT #489 HAYS
15518 -01	DOM	01-JAN-1979	13	18	30	4780	910	NW	NE	NE	1	-99.357644	38.898476	1.34	1.93	20	COX
32532 -02	DOM	04-NOV-1991	13	18	30	5120	870	NW	NE	NE	1	-99.357501	38.899409	1.34	1.93	10	COX
32546 -01	IND	14-MAY-1984	14	18	3	3100	4155	SE	SW	NW	2	-99.313785	38.865018	0.08	1.93	63	APAC KANSAS INC
40356 -01	DOM	30-JUL-1978	13	18	30	5255	2490	NW	NW	NE	1	-99.363159	38.899789	0.00	1.60	15	CLAYCAMP

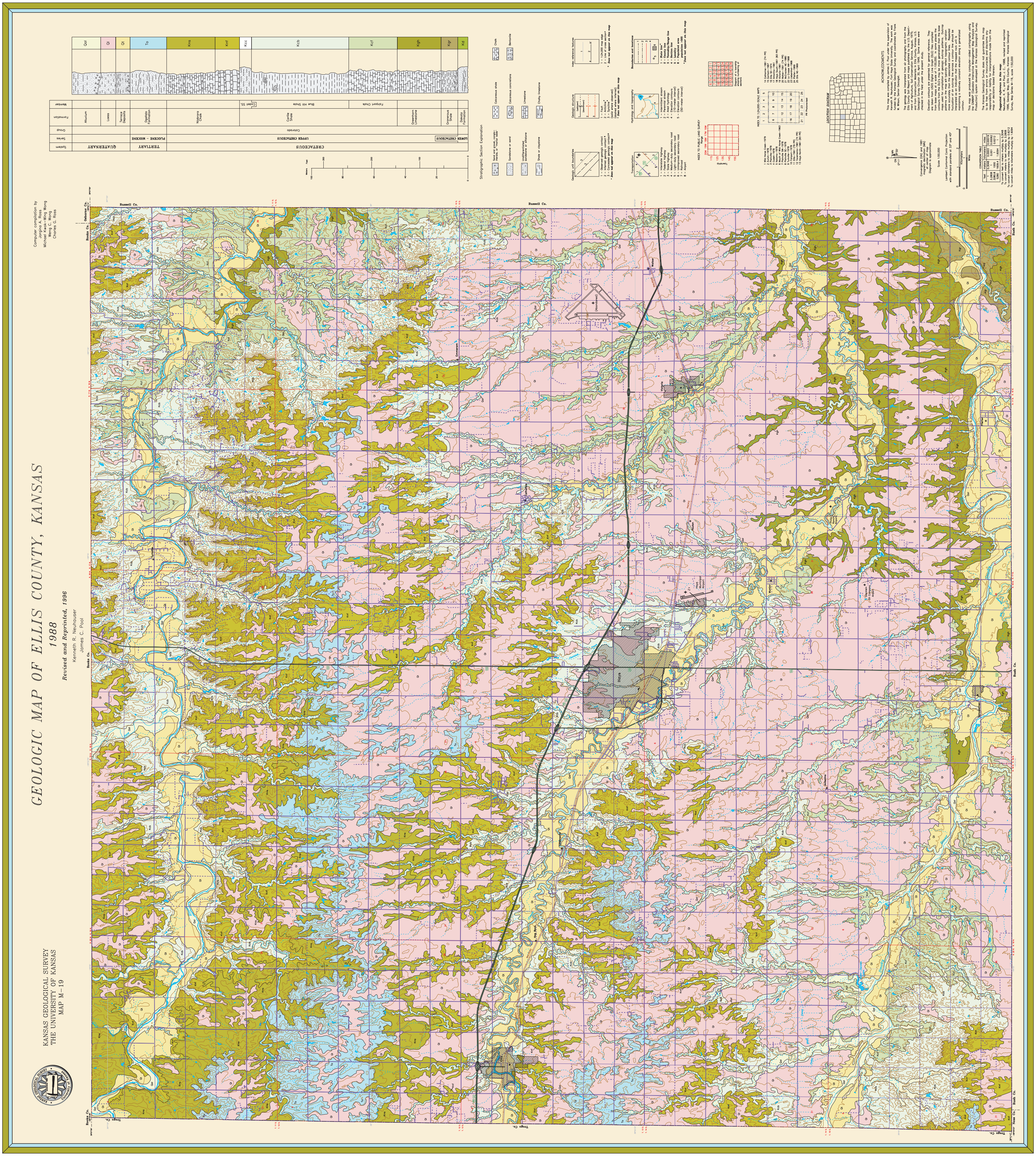
Active Non-City Water Rights Near the City of Hays

Big Creek Alluvial Aquifer, Hays Kansas

FILE NUMBER	Use	PRIORITY	TWP	RNG	SECT	FT NORTH	FT WEST	Q3	Q2	Q1	WELLS	GIS_LONG	GIS_LAT	2011_AF_USED	AUTH_QUANT	AUTH_RATE	OWNER
40473 -01	IRR	11-JUN-1973	13	18	32	890	1153	NW	SE	SE	1	-99.340080	38.873340	1.56	1.57	35	FORT HAYS STATE UNIVERSITY
37978 -01	DOM	03-OCT-1985	13	18	29	5180	2540	NW	NW	NE	1	-99.344893	38.899705	0.00	1.57	25	UEHLING & CAMMY J MATHEWS
32002 -01	IND	16-APR-1984	14	18	3	2700	1320		NC	E2	1	-99.302710	38.863210	0.05	1.53	6	WERTH
36762 -01	IND	20-JAN-2012	14	18	4	143	5013	SW	SW	SW	2	-99.335384	38.856976	0.00	1.50	45	AGRICULTURAL RESEARCH CENTER - HAYS
33703 -01	IRR	11-JUN-1973	13	18	32	1047	1999	NW	SW	SE	1	-99.343050	38.873770	1.50	1.50	35	FORT HAYS STATE UNIVERSITY
37810 -01	DOM	19-APR-1980	13	18	29	4400	2560	SW	NW	NE	1	-99.344953	38.897564	0.00	1.41	20	WILLIAMS
35866 -01	IND	14-MAY-1984	14	18	2	1496	4212	SE	NW	SW	2	-99.295375	38.860530	0.02	1.20	37	APAC KANSAS INC
32532 -03	IRR	12-APR-1976	13	18	29	2900	1056	SW	SE	NE	1	-99.339648	38.893445	3.96	1.08	87	SMOKY HILL COUNTRY CLUB INC
33218 -01	DOM	18-DEC-1978	13	18	19	720	1890	NE	SW	SE	1	-99.361015	38.901803	12.89	1.04	100	GREEN
37951 -01	DOM	01-JUN-1981	13	18	19	1320	2220	W2	W2	SE	1	-99.362174	38.903451	6.44	1.04	50	GREEN
31603 -01	IND	14-MAY-1984	14	18	4	4545	1595	E2	NW	NE	1	-99.323370	38.868800	1.40	0.86	25	APAC KANSAS INC
36340 -01	DOM	23-JUL-1979	13	18	19	440	1040	SW	SE	SE	1	-99.358027	38.901035	0.00	0.83	25	LEIKER
32467 -01	DOM	04-APR-1978	13	18	19	570	2070	SW	SW	SE	1	-99.361649	38.901391	0.00	0.83	20	BEMIS
32532 -01	IRR	03-SEP-1996	13	18	32	5108	2890	NE	NE	NW	1	-99.346180	38.884920	0.16	0.77	15	PRECISION VALLEY GOLF CENTER LLC
32287 -02	DOM	01-SEP-1983	13	18	19	270	2180	SW	SW	SE	1	-99.362036	38.900567	0.00	0.61	15	REIN
35432 -01	DOM	30-JUL-1968	13	18	30	4730	1937	NE	NW	NE	1	-99.361235	38.898344	0.00	0.09	25	CLAYCAMP

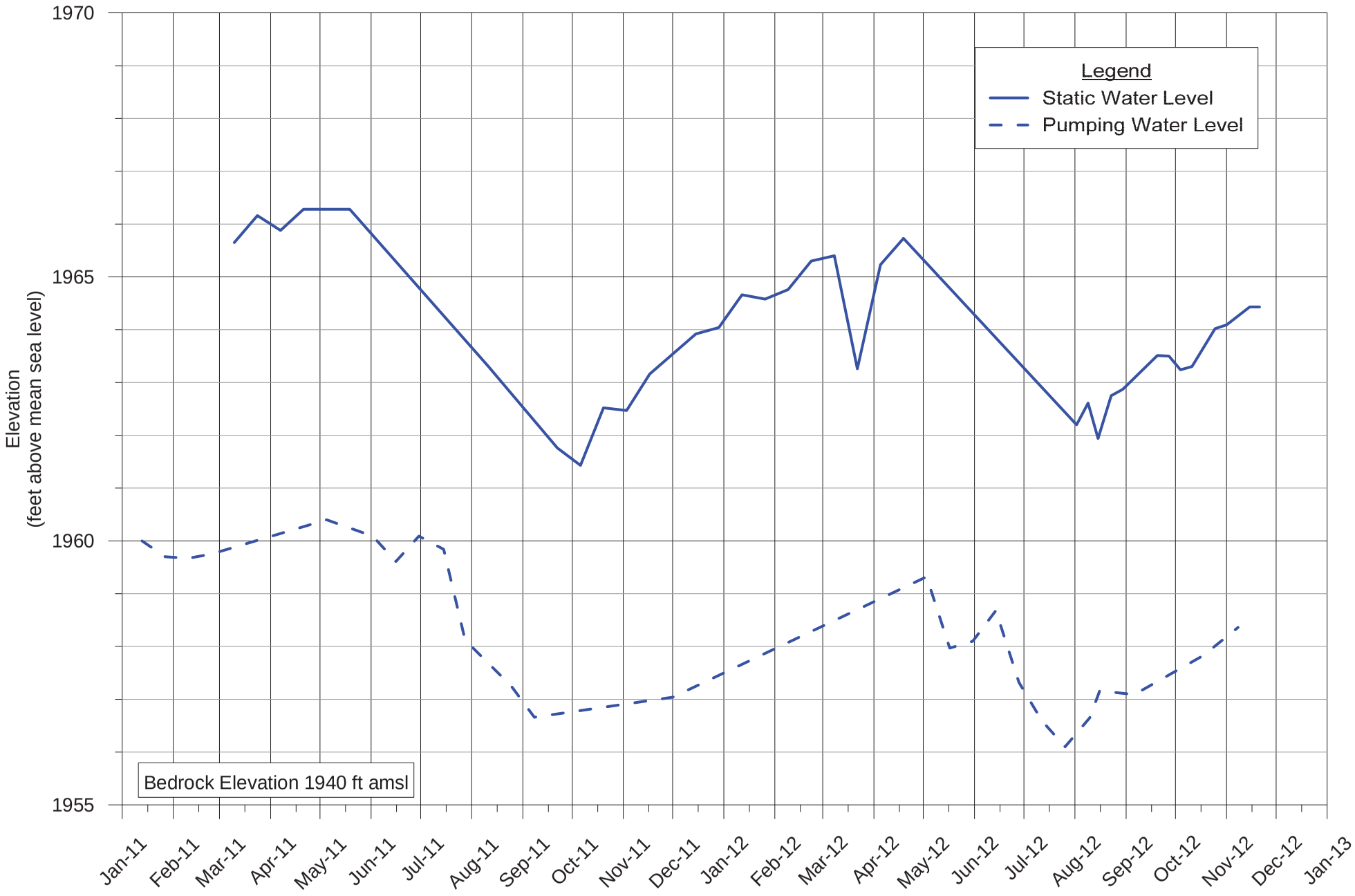
Appendix C

Ellis County Geologic Map


GEOLOGIC MAP OF ELLIS COUNTY, KANSAS
1988
Revised and Reprinted, 1996
Kenneth R. Neuhauser
James C. Pool
Computer compilation by
Jorgina A. Ross
Michael Kelvin-Ming Wong
Meng C. Wong
Charles G. Ross
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
MAP M–19
Russell Co.
Rooks Co.
Rush Co.
Trego Co.
Hays

Appendix D

Hydrographs



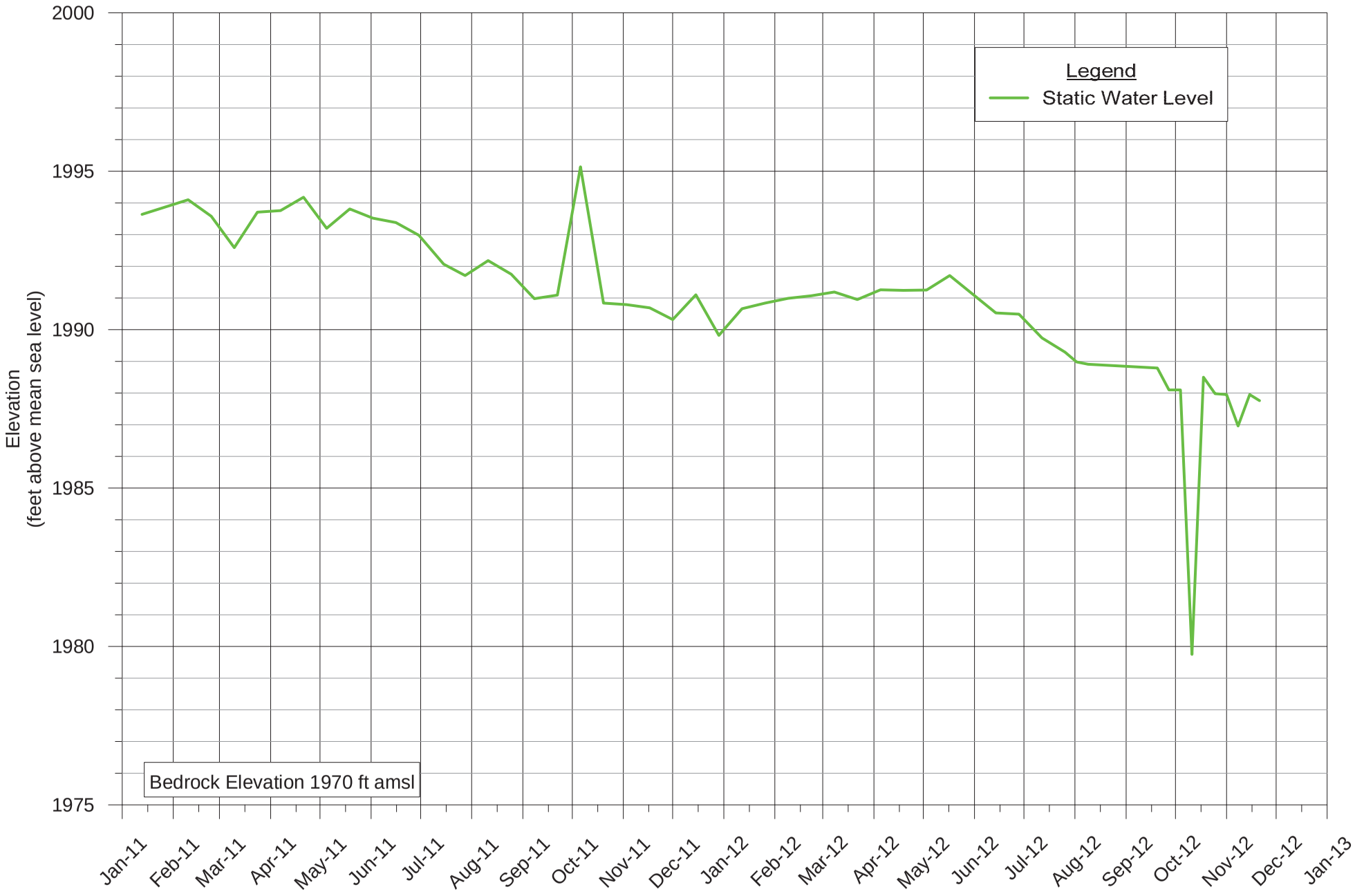
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-19 Hydrograph.grf

Hays Big Creek Well C-19
Water Level Hydrographs
Jan 2011 to Dec 2012



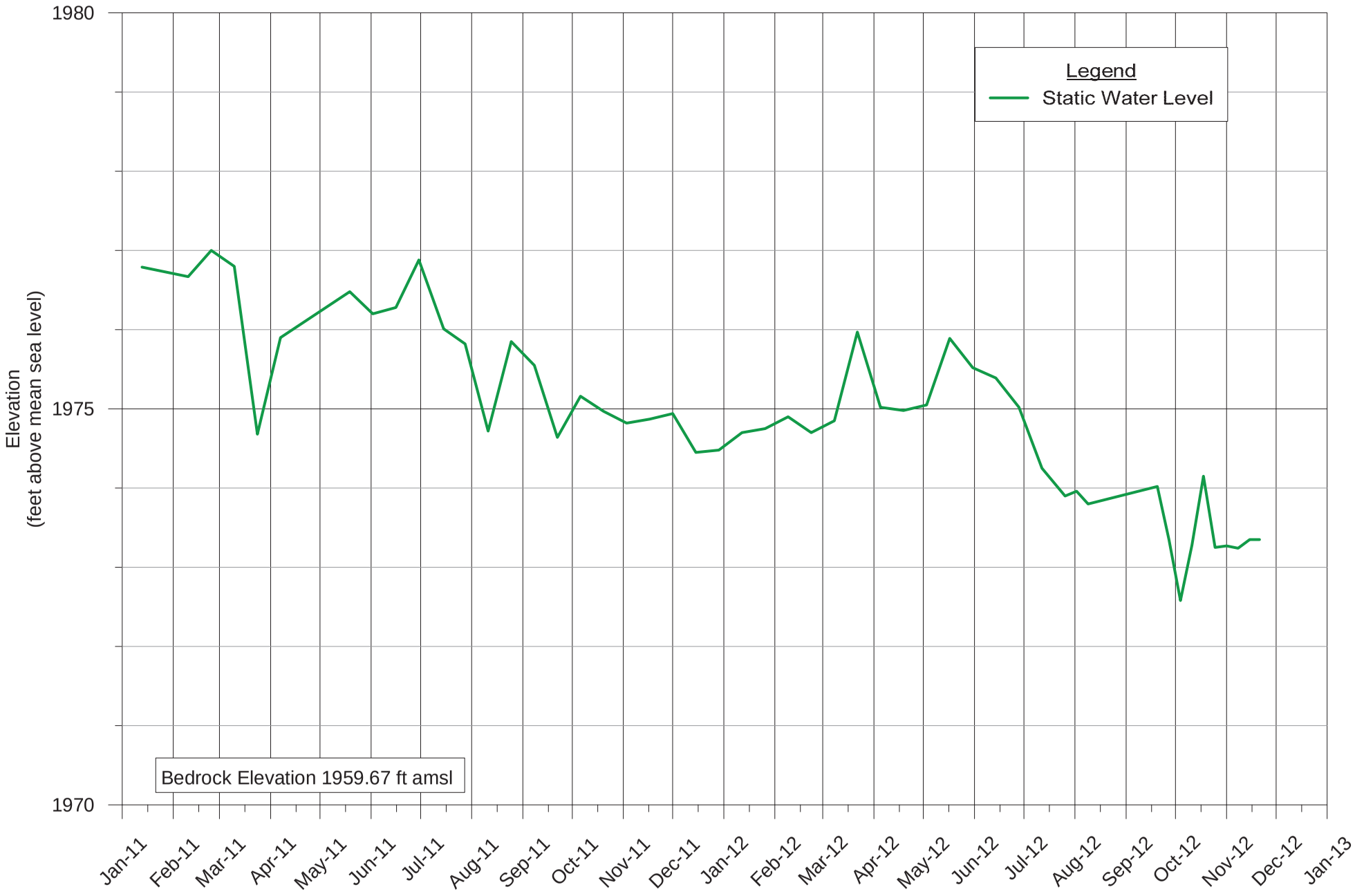
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-21 Hydrograph.grf

Hays Big Creek Well C-21
Water Level Hydrographs
Jan 2011 to Dec 2012



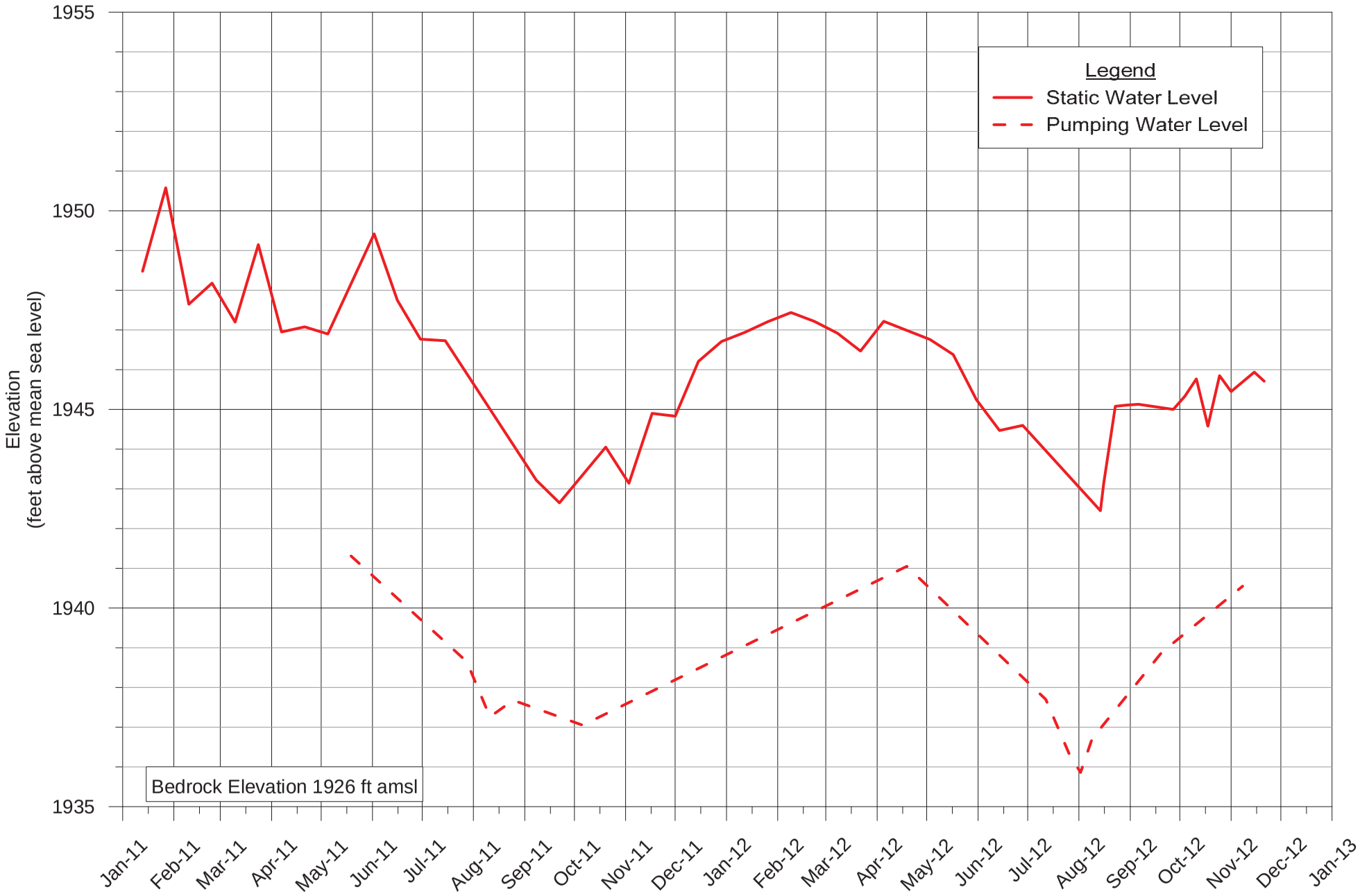
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-24 Hydrograph.grf

Hays Big Creek Well C-24
Water Level Hydrographs
Jan 2011 to Dec 2012



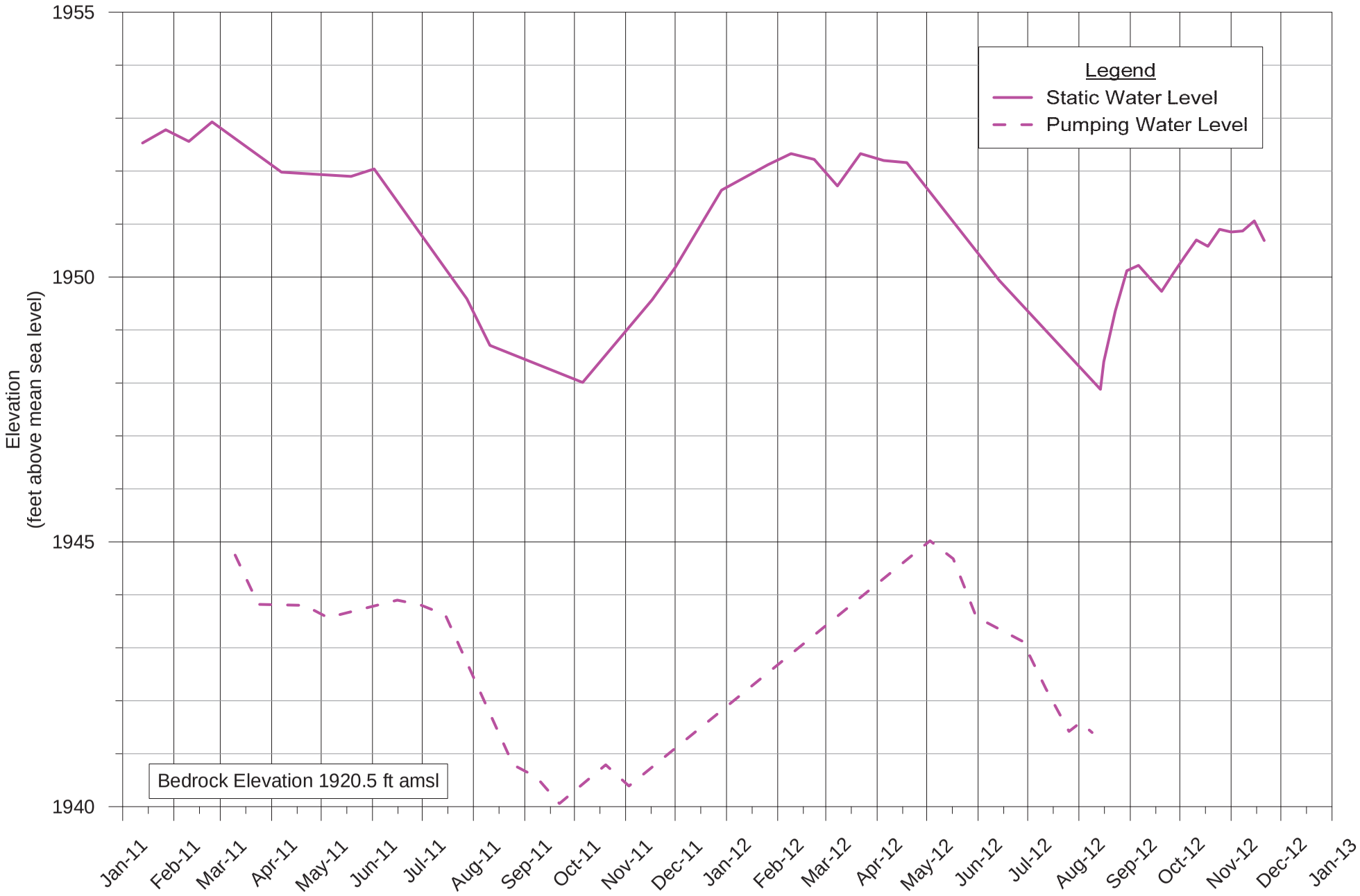
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-27 Hydrograph.grf

Hays Big Creek Well C-27
Water Level Hydrographs
Jan 2011 to Dec 2012



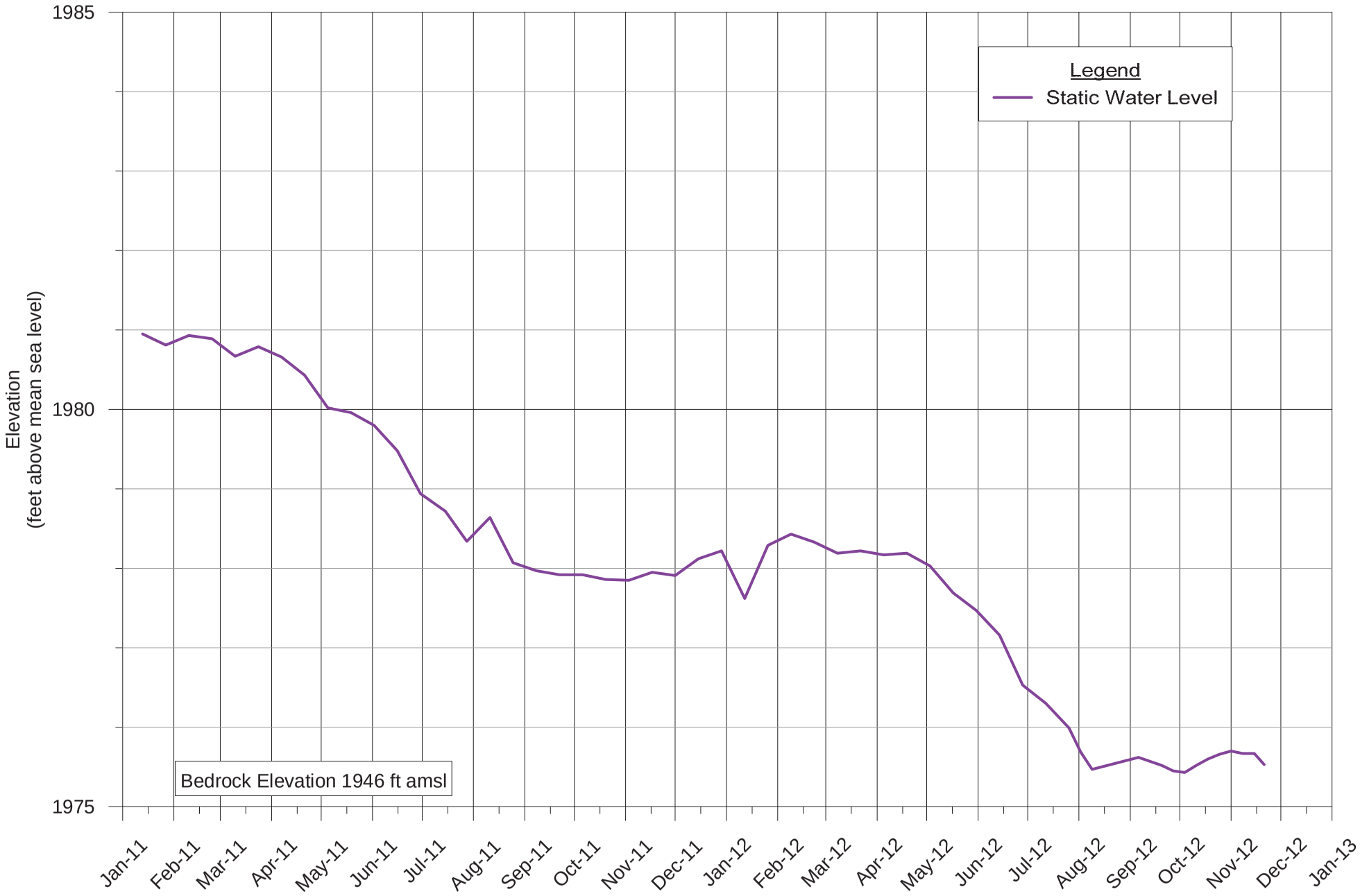
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-28A Hydrograph.grf

Hays Big Creek Well C-28A
Water Level Hydrographs
Jan 2011 to Dec 2012



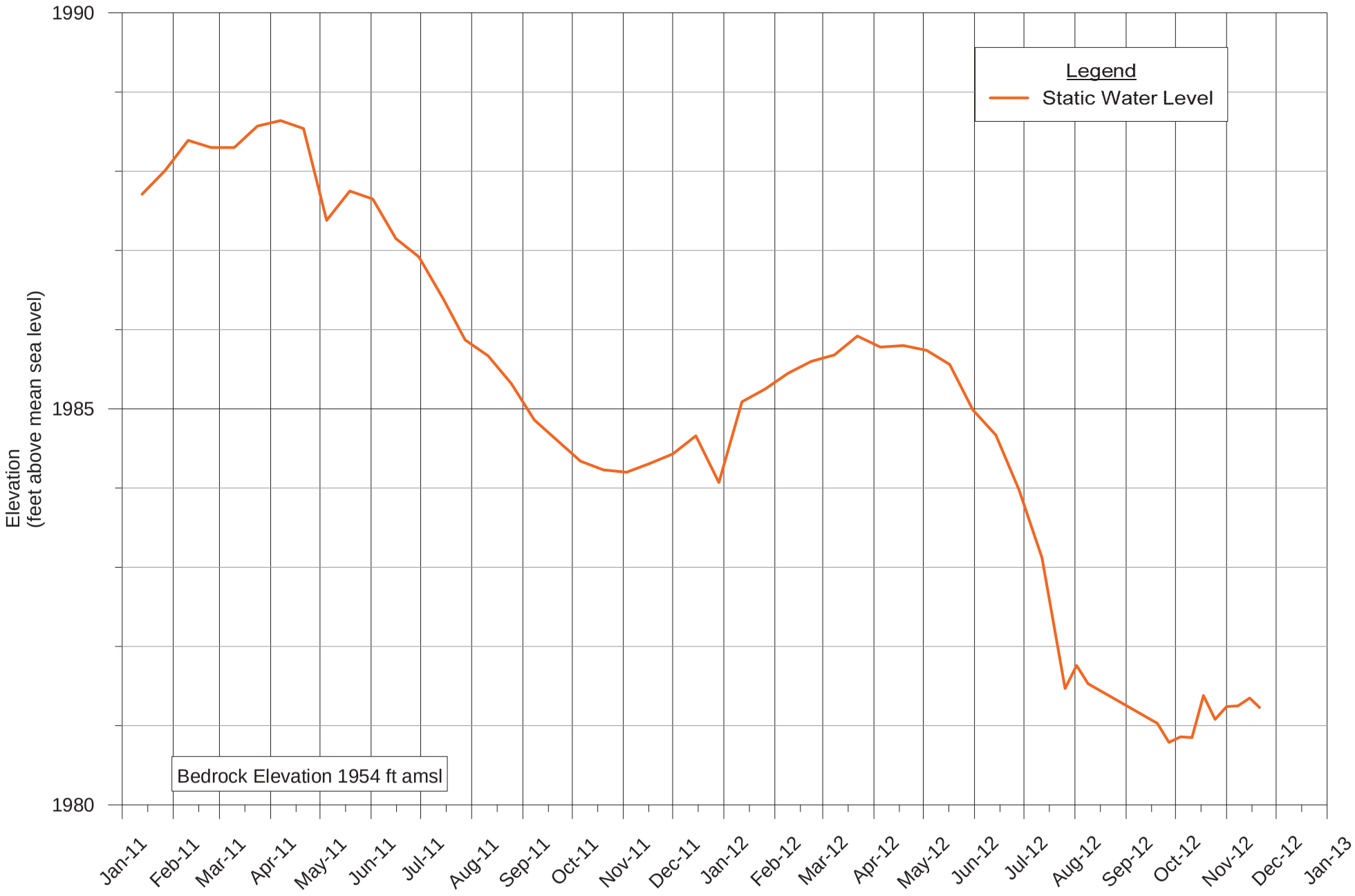
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-29 Hydrograph.grf

Hays Big Creek Well C-29
Water Level Hydrographs
Jan 2011 to Dec 2012



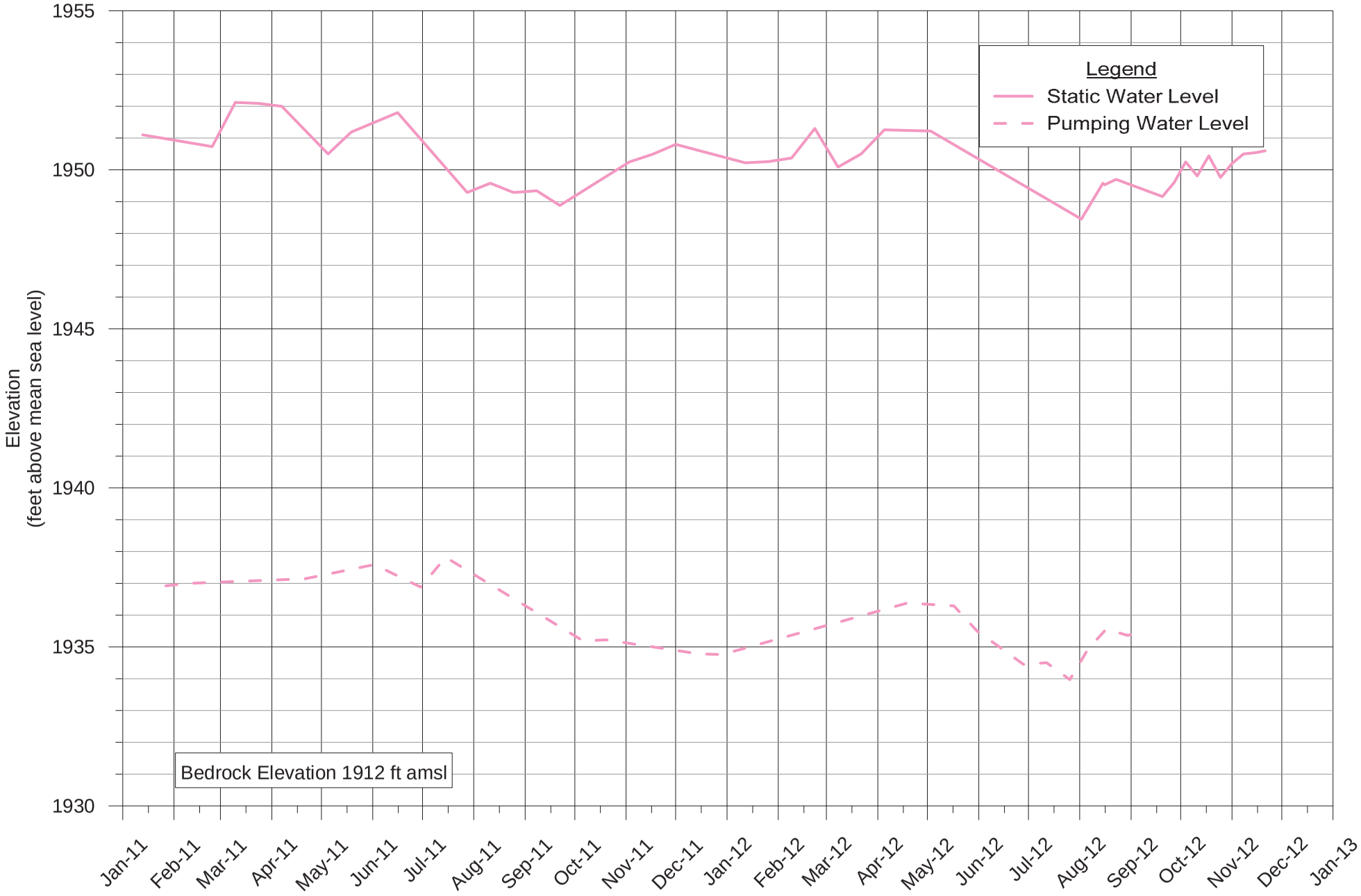
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-30 Hydrograph.grf

Hays Big Creek Well C-30
Water Level Hydrographs
Jan 2011 to Dec 2012



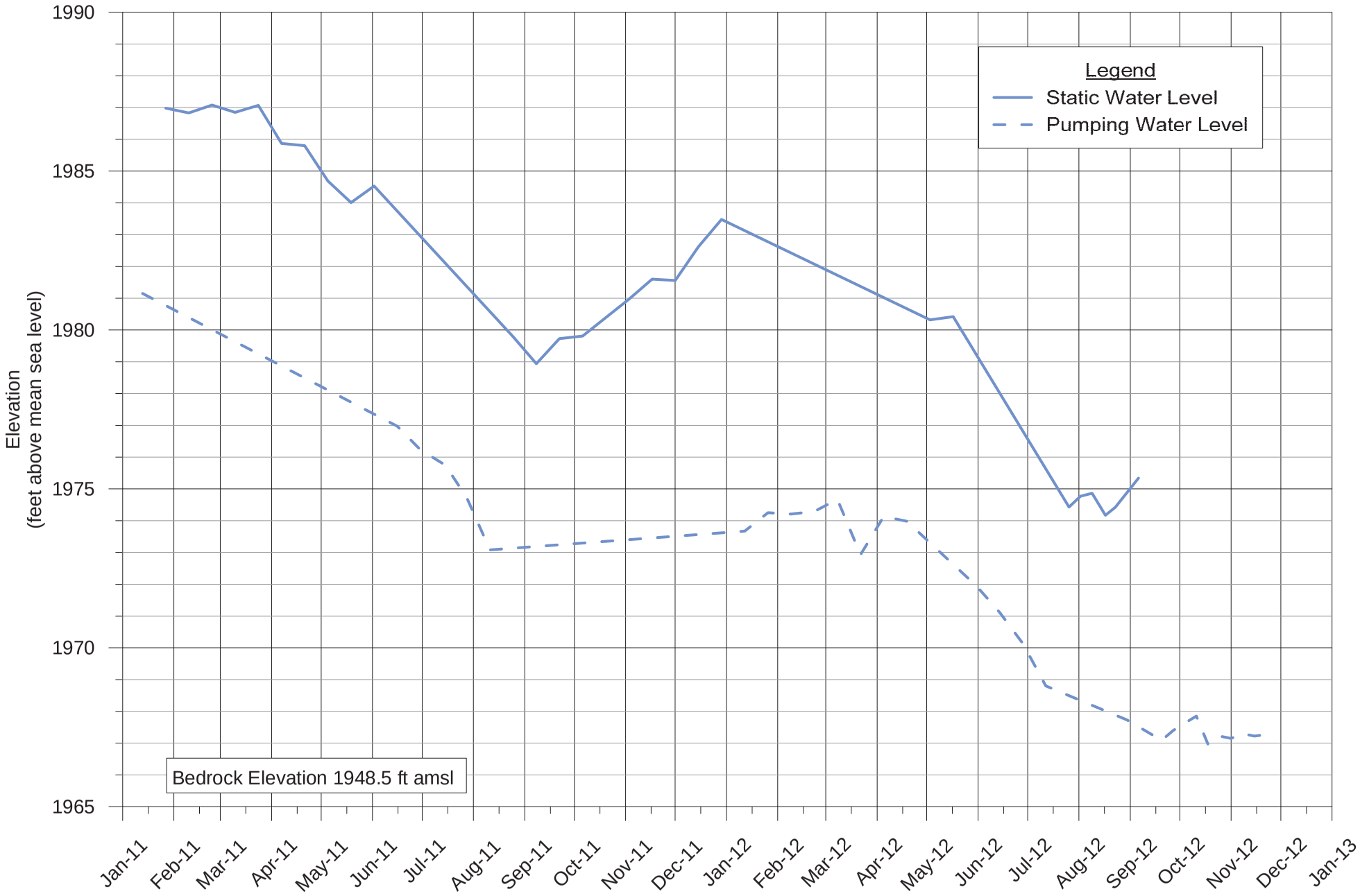
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-31 Hydrograph.grf

Hays Big Creek Well C-31
Water Level Hydrographs
Jan 2011 to Dec 2012



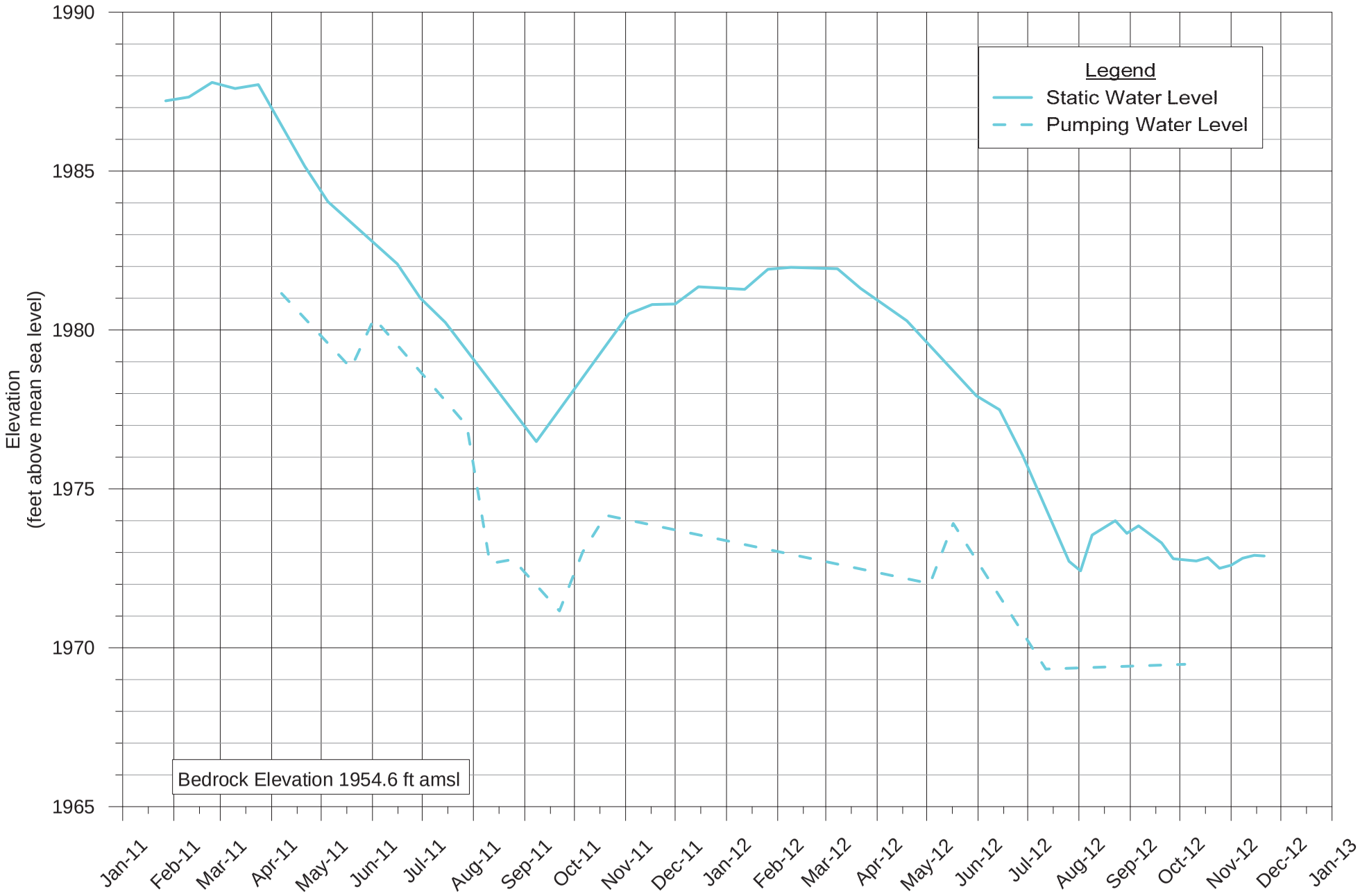
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-32 Hydrograph.grf

Hays Big Creek Well C-32
Water Level Hydrographs
Jan 2011 to Dec 2012



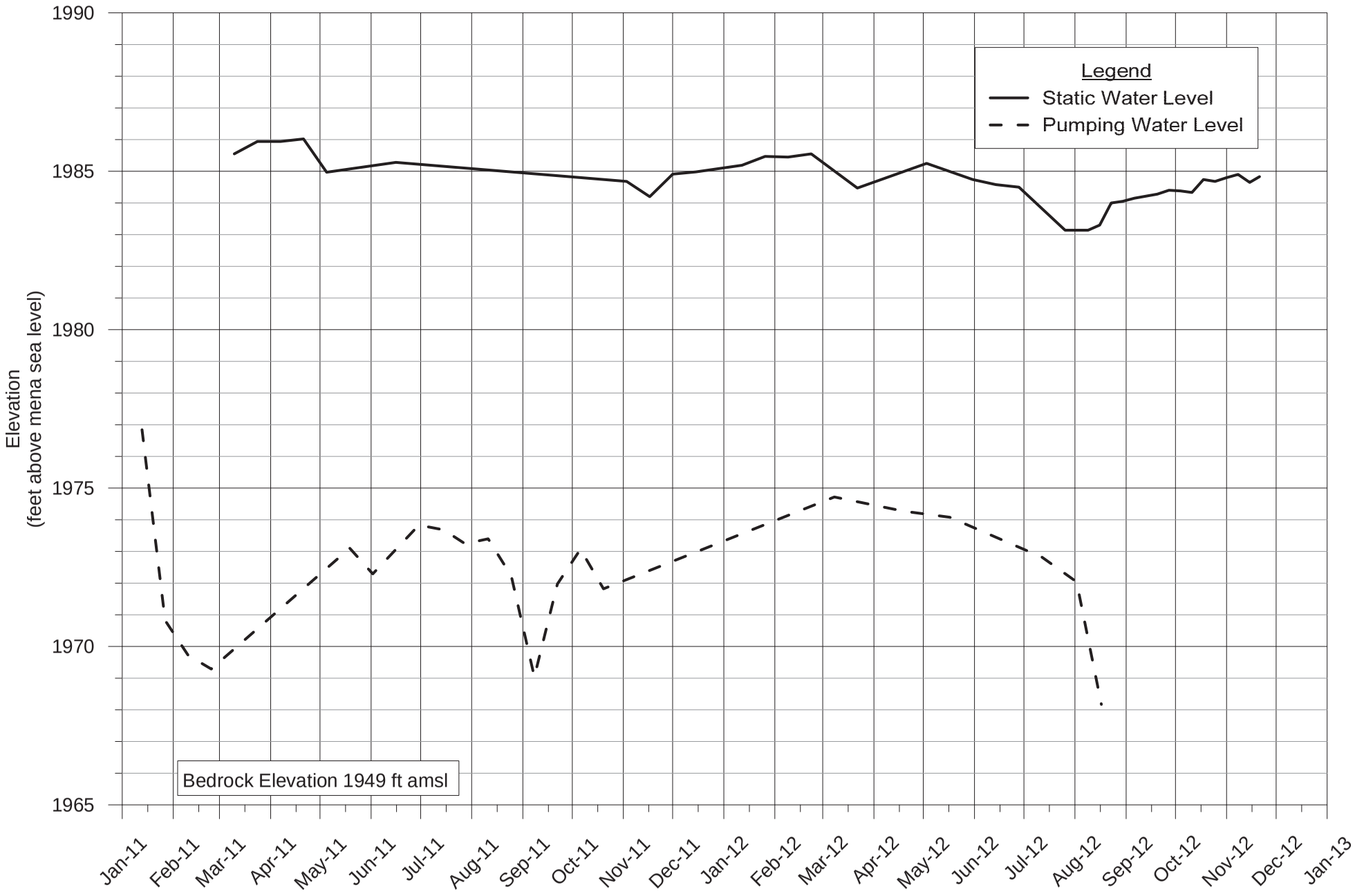
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
C-33 Hydrograph.grf

Hays Big Creek Well C-33
Water Level Hydrographs
Jan 2011 to Dec 2012



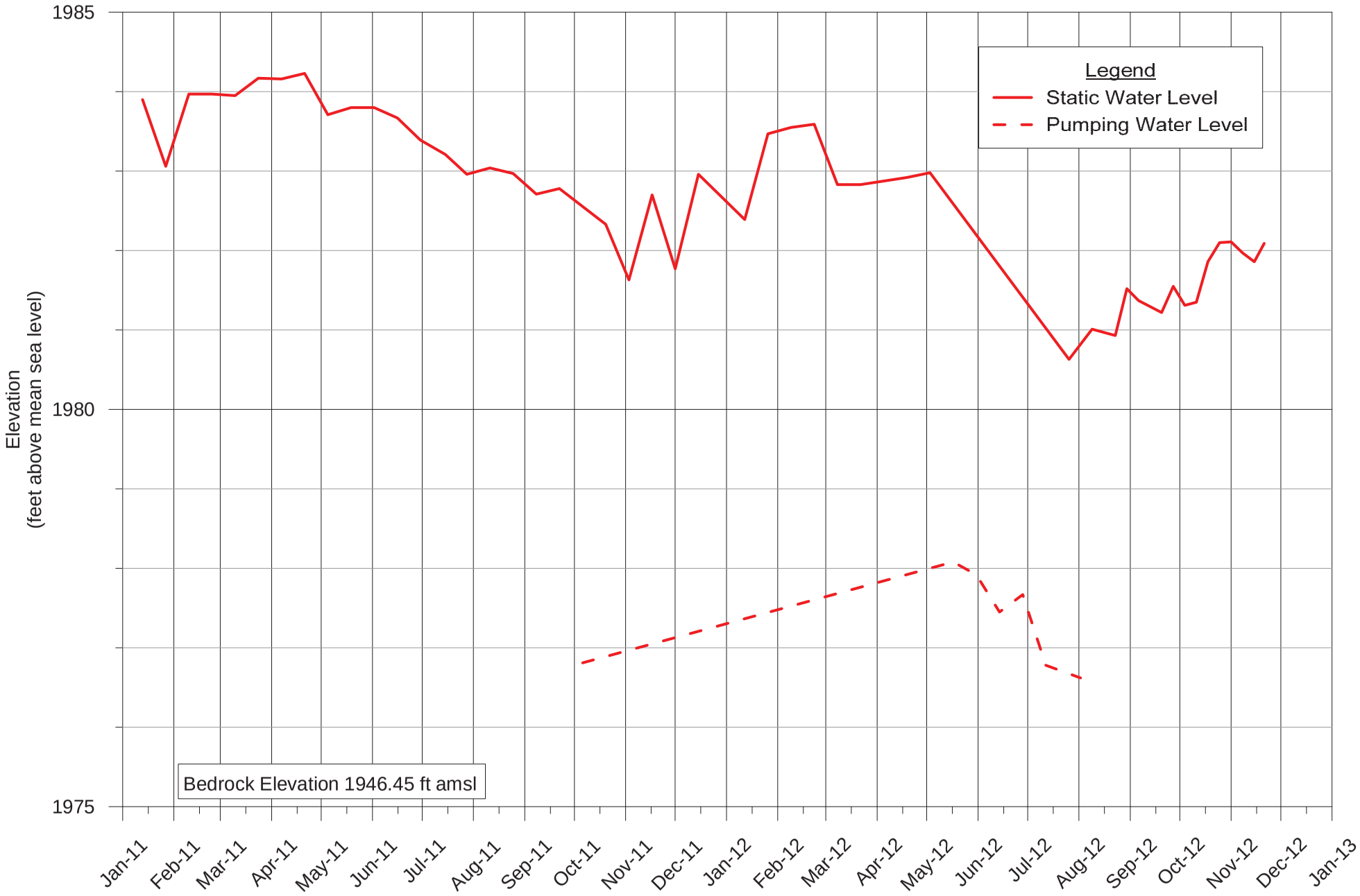
Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

Project No.
68917

File Name:
YE-1 Hydrograph.grf

Hays Big Creek Well YE-1
Water Level Hydrographs
Jan 2011 to Dec 2012



Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, Missouri 64114
(816) 333-9400

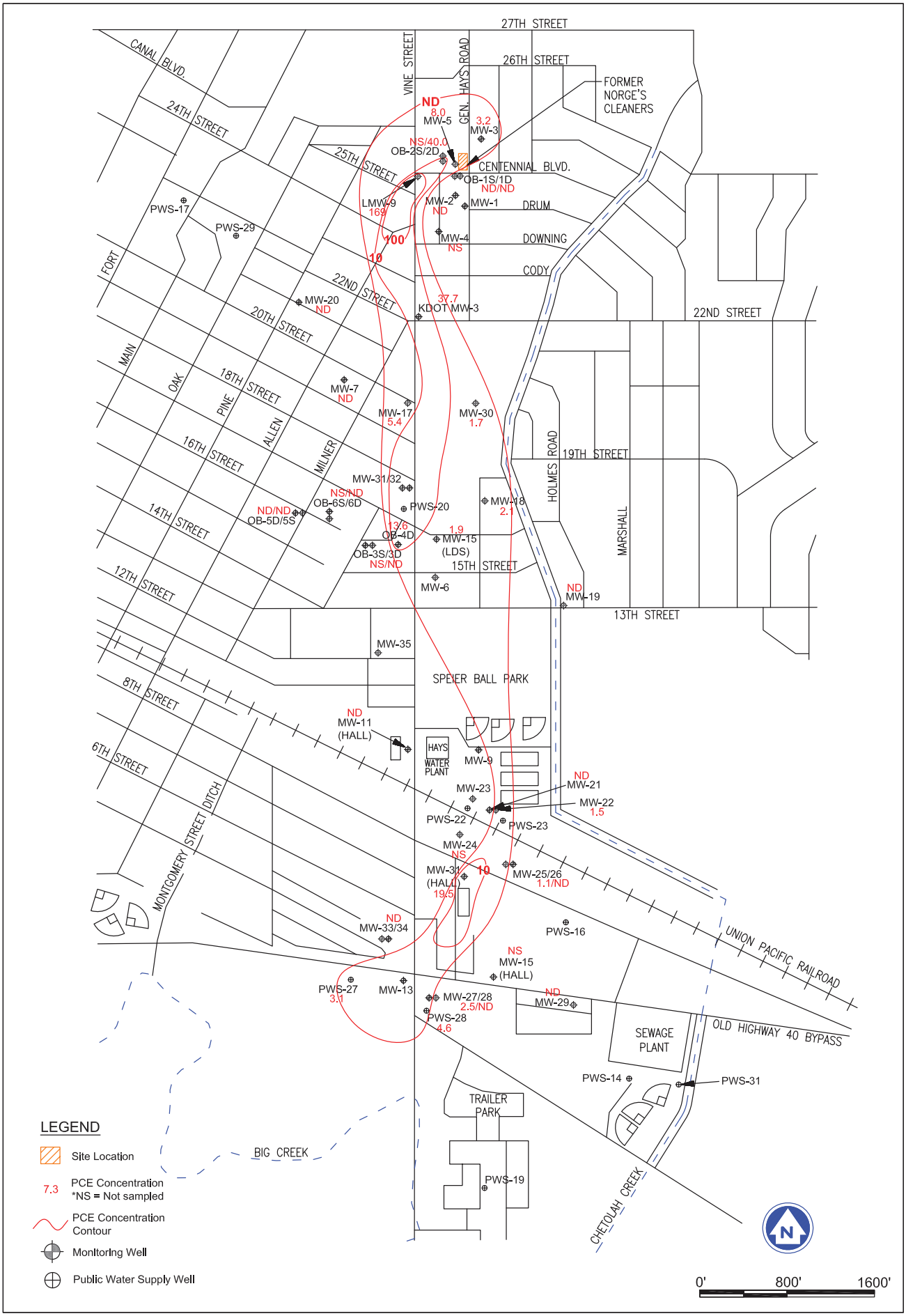
Project No.
68917

File Name:
YE-2 Hydrograph.grf

Hays Big Creek Well YE-2
Water Level Hydrographs
Jan 2011 to Dec 2012

Appendix E

PCE Plume Map



Former Norge's Cleaners 1015 Centennial Blvd Hays, Kansas	Figure 3 - PCE Iso-concentration Map		
	DRAWN BY: TJL	DATE: 05/15/12	EMR INCORPORATED INFRASTRUCTURE AND ENVIRONMENT
	CHECKED BY: JAH	KDHE PROJECT CODE: C6-026-00034	
	PROJECT NO. 9327-001	REVISION NO. 1	

June 24, 2015

Mr. Toby Dougherty
City Manager
City of Hays, Kansas
1000 Vine Street
Hays, Kansas 67601

Re: Big Creek Alluvial Aquifer Health Index

Dear Mr. Dougherty:

Burns & McDonnell (BMcD) was contracted by the City of Hays (City), Kansas to develop an Aquifer Health Index (AHI). The AHI described in this letter report was created to assist the City in operating the Big Creek alluvial well field in a manner that should preserve the long-term viability of the Big Creek Alluvial Aquifer (aquifer). This letter report summarizes the evaluation of the available hydrogeologic data that forms the basis of the AHI, and also describes the development of the AHI itself.

Introduction

The objective in developing the AHI was to provide the City with a simple spreadsheet tool that can be used by the City to monitor the availability of water in the aquifer. The specific objectives for the AHI were to provide the City with a tool that could be used to:

- Evaluate level trends and action levels in the aquifer based on water levels and recharge.
- Facilitate the City in determining water conservation warnings and determining potential shifts in operations.

Background Data Review

The AHI presented in this letter report was developed based on the relationships between groundwater elevations in the aquifer, streamflow in Big Creek, precipitation near Hays, and City well field pumping from wells located within the Big Creek well field. To evaluate these relationships, BMcD used water level data collected from monitoring wells that were equipped with pressure transducers/data loggers. These wells include monitoring wells: C19M, C24EM, C33M1, Cemetery MW, and YEM2 (Figure 1). Other data sources included:

- Streamflow measurements were obtained from United States Geological Survey (USGS) Big Creek stream gage (6863500), which is located within the Big Creek well field (Figure 1).
- Daily precipitation data were obtained from the Community Collaborative Rail Hail and Snow Network, for station HAYS 2.8 WNW (KS).

- Daily well pumping data was provided by the City in the form of totalized flow measurements for each well located in the Big Creek well field.

BMcD plotted the measured groundwater elevations, along with streamflow, precipitation, and City well field pumping (Figure 2). The period of record for these observations is from November 15, 2013 to December 19, 2014. The monitoring period shown on Figure 2 can be divided into two sub-periods on the basis of streamflow in Big Creek. Period A was characterized by intermittent, generally low flow from Nov. 15 to June 5, 2014. A flood surge in Big Creek from heavy rains in June 2014 marks the start of Period B, which is characterized by mostly steady flow in Big Creek with occasional spikes from precipitation and occurs from June 5 to December 19. The prolonged period of high streamflow observed during Period B served as a recharge event for the aquifer, which is evident when reviewing the water level response in the monitoring wells during this time period.

Generally, the monitoring wells exhibit similar patterns of water level change through the monitoring period; the exception being C33M1 and C19M, which had different water level trends during Period A than the other monitoring wells. Monitoring Well C33M1 appears to be recovering from a pumping cycle during the first months of Period A, while monitoring well C19M exhibited a downward trend in water levels whereas other wells were either flat or trended upward over the same period. This is most likely due to pumping that is localized near C19M. Both monitoring wells C33M1 and C19M exhibited similar water level pattern as the other wells during Period B, following the period of sustained high streamflow in Big Creek.

General Observations

After reviewing the data presented above, the following observations were made regarding fluctuations in groundwater elevations at the monitoring wells:

- Daily fluctuations in groundwater elevations at monitoring wells C33M1, Cemetery MW, and YEM 2 appear to be highly influenced by changes in local pumping.
- The overall trend in groundwater elevation at C33M1 appears to be primarily influenced by irrigation pumping from the local golf course, as the groundwater level response observed in this monitoring well exhibited a signal that is typical of hydrographs near irrigation wells (recharge followed by drawdown followed by recharge).
- The overall trend in groundwater elevation at C19M appears to be influenced by pumping from City wells.
- Precipitation is closely correlated to changes in Big Creek streamflow. Tracking recharge to the aquifer resulting from precipitation and extended periods of high streamflow can be accomplished by tracking streamflow.

- Each of the five (5) monitoring wells appears to respond to changes in Big Creek streamflow. Some wells exhibited a more muted response than others, primarily due to distance from Big Creek. The distances of the monitoring wells to Big Creek are summarized below in Table 1.

Table 1 Distance from Monitoring Wells to Big Creek

Monitoring Well	Distance from Big Creek (feet)
YEM 2	665
C24EM	995
C19M	2033
C33M1	3798
Cemetery MW	6305

Detailed Observations

In addition to the interpretation presented in Figure 2, BMcD developed several similar figures that present the monitoring wells individually (Attachment A). These plots illustrate the time varying change in groundwater elevation, along with Big Creek streamflow, City pumping from the Big Creek well field, and precipitation. From these individual plots, BMcD determined that there is a very close correlation between precipitation and streamflow, and that the impact of groundwater recharge could be best evaluated through monitoring changes in streamflow. The individual monitoring well plots are accompanied by a summary of observations regarding the correlation between groundwater level elevations at each monitoring well and the other measured parameters.

AHI Development

The hydrologic relationships previously described were used to develop a tool that can be used by the City to monitor the availability of water in the Big Creek Alluvial Aquifer. The AHI is an Excel spreadsheet that produces a quantitative score that is intended to represent the relative health of the aquifer.

AHI Scoring System

The scoring system in the AHI is based on a scale of zero to 100. The three factors that are included in the AHI are summarized below:

1. **Saturated thickness of the aquifer**. A total of 50 points are available in the AHI for the saturated thickness of the aquifer measured at the five (5) monitoring wells sites listed in Table 1. The available points are distributed equally amongst the five (5) monitoring wells, with each well contributing a maximum of 10 points.
2. **Streamflow conditions in Big Creek**. A total of 30 points are available in the AHI based on streamflow conditions in Big Creek.
3. **Projected pumping from the City well field**. A total of 20 points are available based on the project daily pumping from the Big Creek well field.

The primary analytical tool used to establish the scoring values used in the AHI spreadsheet was the cumulative frequency curve. A cumulative frequency curve summarizes the percentage of observations that are less than or equal to a specified value, and are used to understand the context of a single measurement compared to the full historical record of those measurements. An example of a common cumulative frequency curve used in hydrologic analysis is a flow duration curve.

Cumulative frequency curves were used in this analysis as a method to determine the percentage of time a specified value (either aquifer thickness or streamflow) is equaled or exceeded based on the available historical record of field measurements. To develop the AHI, cumulative frequency curves were developed for each of the five (5) monitoring wells and for the Big Creek stream gage. These cumulative frequency curves described above are included in Attachment B.

Aquifer Saturated Thickness

The current aquifer thickness at the five (5) monitoring wells used in the AHI can be evaluated in context with historical measurements of aquifer thickness using the cumulative frequency curves presented in Attachment B. A total of 50 points are available for aquifer thickness at these locations. Scores are based on the percentile from the exceedance curve of the historical saturated thickness at those five wells. Each well can contribute a maximum of 10 points to the AHI, and the point total increases as the saturated thickness increases.

The contribution of each monitoring well to the aquifer saturated thickness score developed by the AHI is currently weighted equally. If, however, over time it is determined that one (1) well should be weighted more or less relative to the other wells, a simple adjustment can be made in the AHI spreadsheet.

A cumulative frequency curve of the aquifer saturated thickness was developed for each of the following monitoring wells:

- C19M – The period of record for this well was 1993 to 2014;
- C24EM – The period of record for this well was 1990 to 2014;
- C33M1 – The period of record for this well was 1996 to 2014;
- Cemetery MW – The period of record for this well was 1990 to 2014; and
- YEM2 – The period of record for this well was 1996 to 2014.

The scores for each monitoring well are assigned based on the saturated thickness exceedance percentage as summarized below (Table 2). The cumulative frequency curves are a way to quantitatively assess the thickness of the aquifer at any point in time based on measured values of aquifer thickness that reflect a historical record of approximately 20 years. A high exceedance percentage is indicative of a low saturated thickness, which results in a lower score in the AHI.

Table 2 – Aquifer Thickness Component of AHI Scoring System

Exceedance Percentage	Points Per Monitoring Well	Total Points for Aquifer Conditions
99.0	4	20
95.0	5	25
90.0	6	30
80.0	7	35
70.0	8	40
50.0	9	45
25.0	10	50

Note: Exceedance percentage equals the percentage of time the saturated thickness of the aquifer is equaled to or exceeded at a monitoring well based on the historical record.

Big Creek Streamflow

A total of 30 points are available in the AHI based on streamflow conditions in in Big Creek. Scores are based on the percentiles of the flow duration curve for the Big Creek gage, with higher streamflow values corresponding to higher scores. To determine the scoring values, a flow duration curve was developed for the USGS stream gage 6863500, which is very close to the City's Big Creek well field wells (Figure 1). The period of record available to perform this analysis for this gage was 1946 to 2015. A high exceedance value is indicative of low streamflow conditions in Big Creek, meaning little recharge is occurring in the aquifer. This condition results in a lower score in the AHI (Table 3).

Table 3 – Big Creek Streamflow Component of AHI Scoring System

Exceedance Percentage	Streamflow (cfs)	Points for Streamflow
> 99.0	0	9
99.0	0.37	12
95.0	1.20	15
90.0	1.80	18
80.0	2.90	21
70.0	4.00	24
50.0	7.90	27
25.0	19 (or greater)	30

Note: 1) Exceedance percentage equals the percentage of time the streamflow is equaled to or exceeded based on the historical record.
2) cfs – cubic feet per second

Well Field Pumping

A total of 20 points are available in the AHI based on projected pumping from the Big Creek alluvial well field. The scores used for well field pumping were based on the range of observed pumping from historical data. A low projected pumping demand means there will be less stress on the aquifer, resulting in a high score in the AHI (Table 4).

Table 4 – Projected Well Field Pumping Component of AHI Scoring System

Projected Weekly Pumping Demand (gallons per day)	Points for Well Field Pumping
0	20
100,000	18
200,000	16
300,000	14
400,000	12
500,000	10
600,000	8
700,000	6

AHI Score Determination

The AHI was developed to include a scale that is similar to that of a school grading system. The results of the AHI should be interpreted as follows:

- **100 to 80 – Excellent aquifer conditions**
  - This condition occurs when there is high to very high streamflow in Big Creek, low to average well field pumping, and the water levels in the aquifer have recovered to be between the 25 to 70 percent exceedance criteria on average in the five (5) monitoring wells.
- **79 to 60 – Good aquifer conditions**
  - This occurs when there is low to average streamflow in Big Creek, low to average well field pumping, and the water levels in the aquifer have are between the 70 to 90 percent exceedance criteria on average in the five (5) monitoring wells.
- **60 to 50 – Fair aquifer conditions**
  - This condition occurs when there is low to no streamflow in Big Creek, average to above average well field pumping, and the water levels in the aquifer are between the 80 and 90 percent exceedance criteria on average in the five (5) monitoring wells.
- **Below 50 – Poor aquifer conditions**
  - This condition occurs when there is little to no streamflow in Big Creek, above average to high well field pumping, and the water levels in the aquifer levels are below the 90 percent exceedance criteria on average in the five (5) monitoring wells.

AHI Evaluation Using 2014 Data

BMcD evaluated the performance of the AHI Excel spreadsheet tool using data collected from 2014. This time frame was selected for the evaluation because daily water level measurements were available to include in the analysis. To review the performance of the AHI Excel spreadsheet, BMcD plotted the AHI score versus the date. The results of this analysis are shown on Figure 3.

The AHI values for 2014 ranged from a low of 50 points (May 29) to 88 points (July 4), with a mean and median value of 66 points. The AHI tracked between 60 and 70 points from January to May, when streamflow was low, pumping was low to average, and water levels were steady. The AHI declined through May as pumping increased, water levels declined, and streamflow remained low. The AHI increased rapidly in June in response to very high streamflow in Big Creek. The AHI remained above 70 through mid-July, reflecting the high streamflow in Big Creek and the rebounding groundwater levels observed in the monitoring wells. The AHI began

to drop below 70 points starting in mid-July and continued to decline until the end of August, when it rebounded in response to another high streamflow event, along with the corresponding rise in groundwater levels.

Summary

The AHI developed by BMcD is a relatively simple spreadsheet based tool that can be used by the City to evaluate conditions in the Big Creek Alluvial Aquifer. The tool is based on the concept of using cumulative frequency curves as a means to relate current groundwater elevations, streamflow conditions, and well field pumping to past observed values.

The AHI spreadsheet tool was populated with 2014 data to check the performance of the spreadsheet. This check indicated that, in 2014, the aquifer was generally in good condition, although there were two time periods where the AHI declined into the "fair" category.

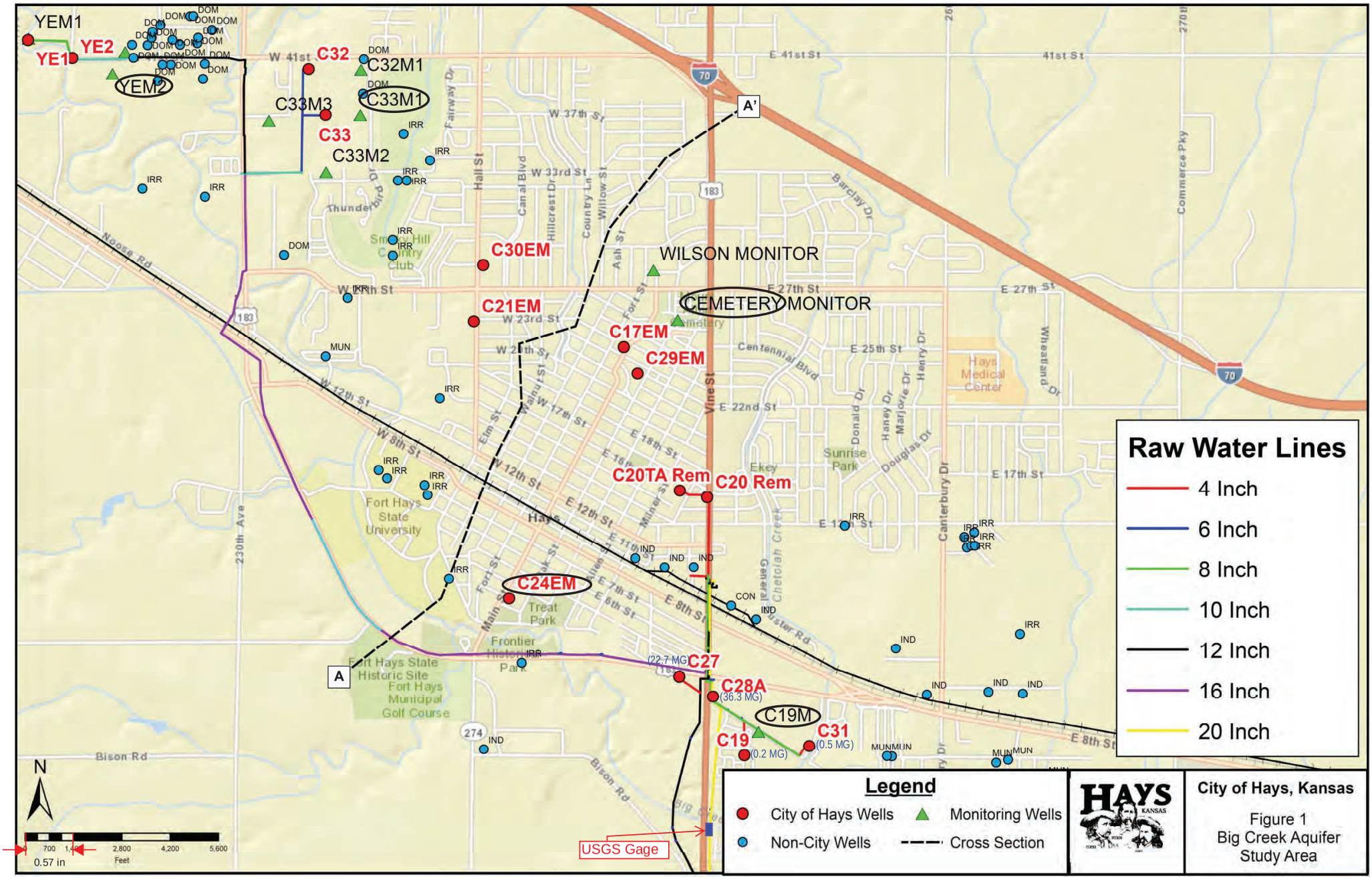
Figure 3 illustrates how the AHI tool can be used in the future by the City as an aquifer management tool. For example, the AHI highlighted that conditions in the aquifer were declining during May and were approaching the "poor" condition. If this type of trend is observed in the future, the City could shift pumping to other sources to meet water demand, or could use the AHI as a basis for initiating water conservation measures.

Sincerely,

Paul McCormick
Associate Geological Engineer

Attachments

Figures


YEM1
YE1
YE2
YEM2
C32
C32M1
C33M3
C33M1
C33
C33M2
C30EM
WILSON MONITOR
CEMETERY MONITOR
C21EM
C17EM
C29EM
C20TA Rem
C20 Rem
C24EM
C27
C28A
(36.3 MG)
(22.7 MG)
C19M
C19
(0.2 MG)
C31
(0.5 MG)
A
A'
USGS Gage
Raw Water Lines
4 Inch
6 Inch
8 Inch
10 Inch
12 Inch
16 Inch
20 Inch
Legend
City of Hays Wells
Monitoring Wells
Non-City Wells
Cross Section
HAYS KANSAS
City of Hays, Kansas
Figure 1
Big Creek Aquifer
Study Area
N
0.57 in
700
1,400
2,800
4,200
5,600
Feet

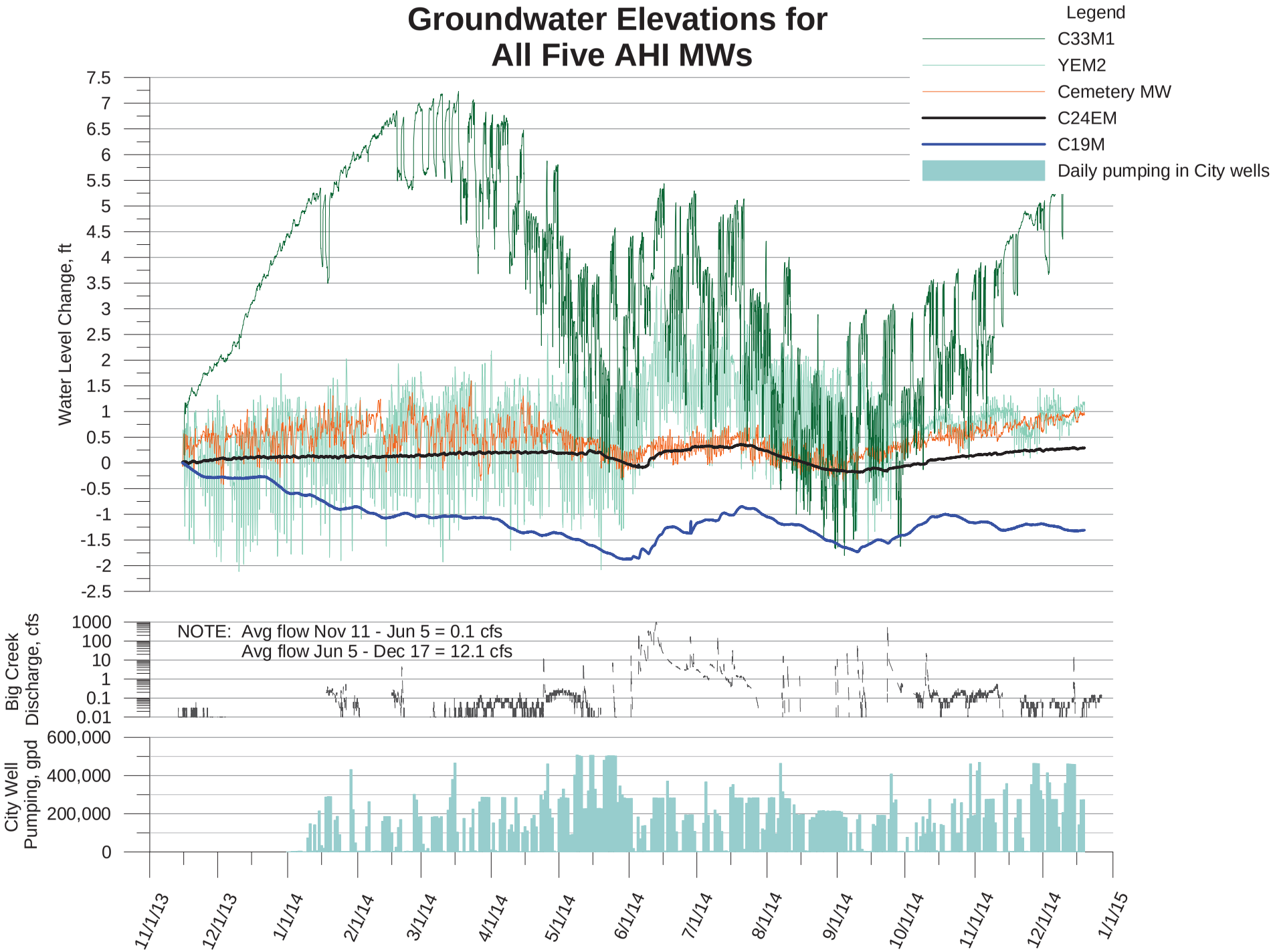

Groundwater Elevations for
All Five AHI MWs
Legend
C33M1
YEM2
Cemetery MW
C24EM
C19M
Daily pumping in City wells
Water Level Change, ft
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
Big Creek Discharge, cfs
1000
100
10
1
0.1
0.01
NOTE: Avg flow Nov 11 - Jun 5 = 0.1 cfs
Avg flow Jun 5 - Dec 17 = 12.1 cfs
City Well Pumping, gpd
600,000
400,000
200,000
0
11/1/13
12/1/13
1/1/14
2/1/14
3/1/14
4/1/14
5/1/14
6/1/14
7/1/14
8/1/14
9/1/14
10/1/14
11/1/14
12/1/14
1/1/15

Figure 2

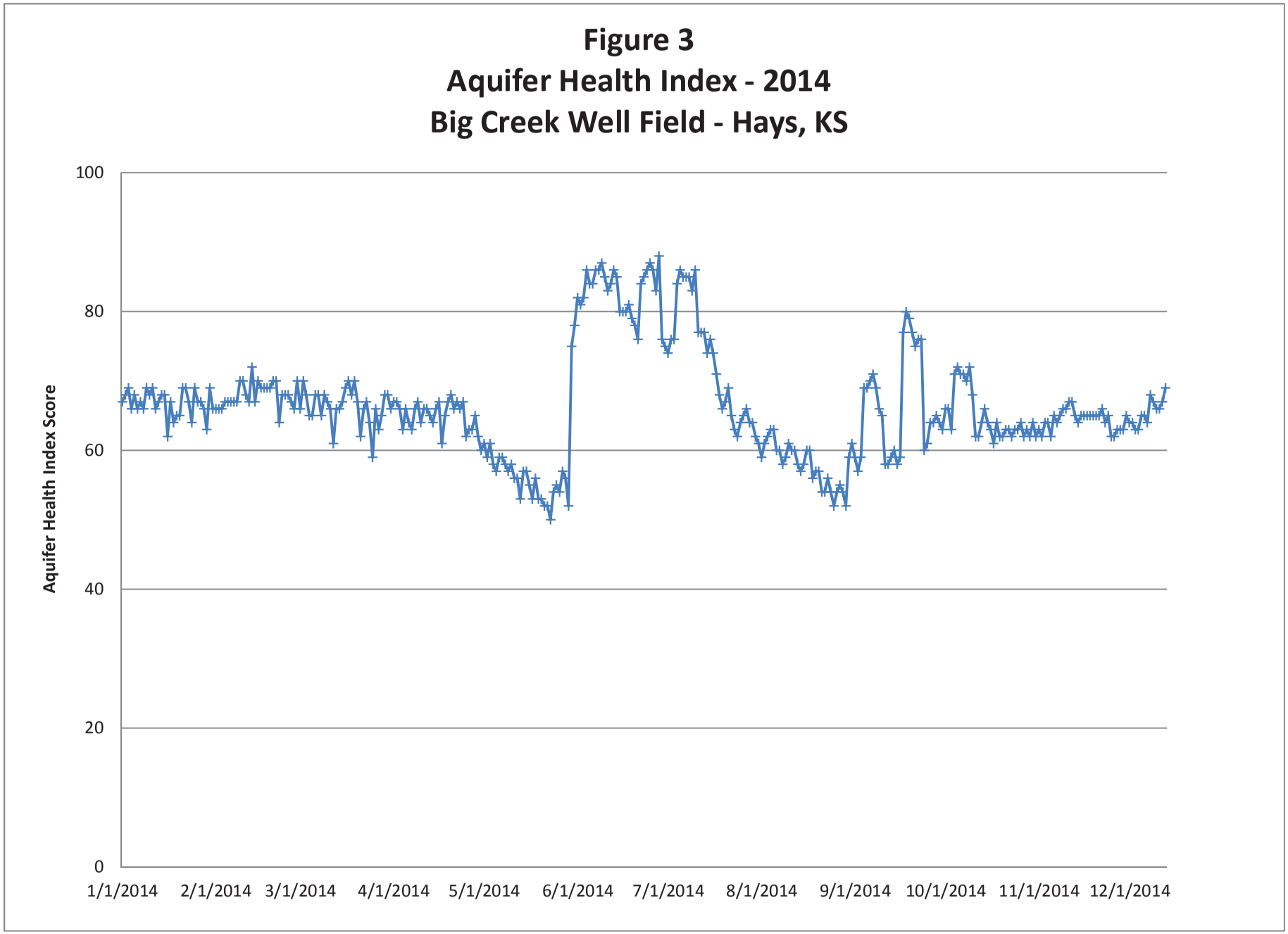


Figure 3
Aquifer Health Index - 2014
Big Creek Well Field - Hays, KS
Aquifer Health Index Score
100
80
60
40
20
0
1/1/2014
2/1/2014
3/1/2014
4/1/2014
5/1/2014
6/1/2014
7/1/2014
8/1/2014
9/1/2014
10/1/2014
11/1/2014
12/1/2014

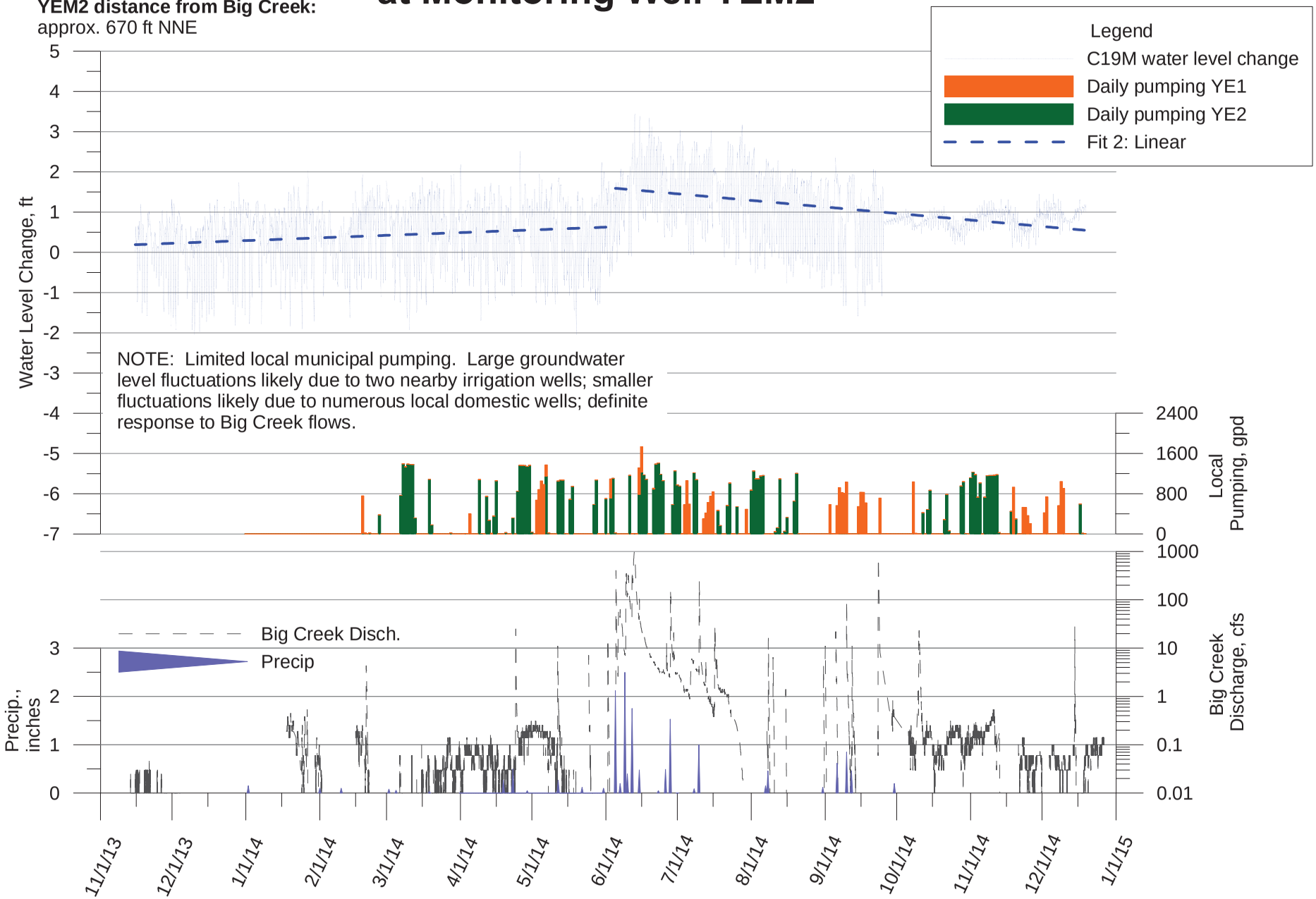
Attachment A – Review of Background Data

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ F 816-333-3690 \ burnsmcd.com

Local Active Municipal Wells
YE1 - 0.08 MG
YE2 - 0.03 MG

YEM2 distance from Big Creek:
approx. 670 ft NNE

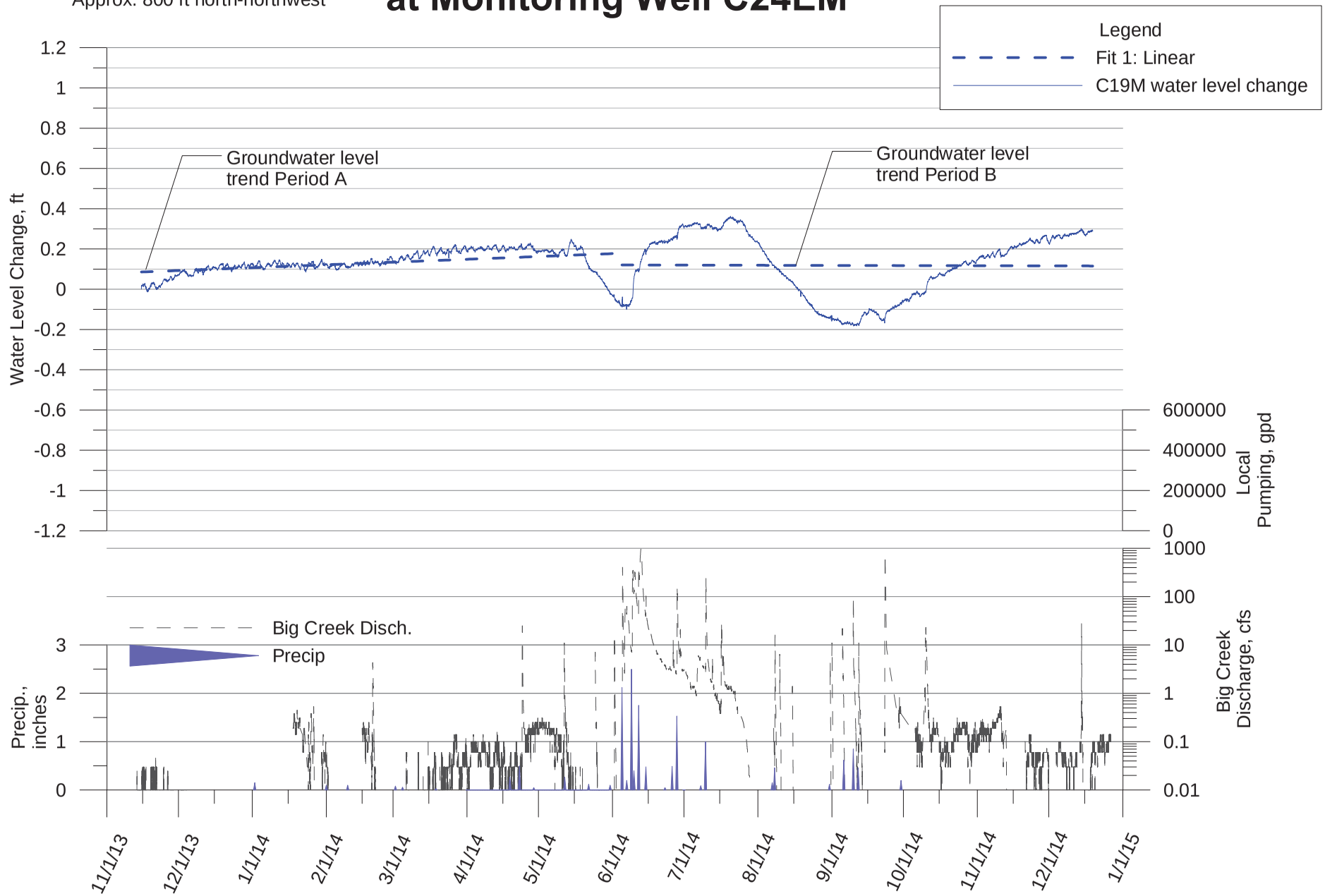
Groundwater Elevation at Monitoring Well YEM2



Local Active Municipal Wells
None

C24EM distance from Big Creek:
Approx. 800 ft north-northwest

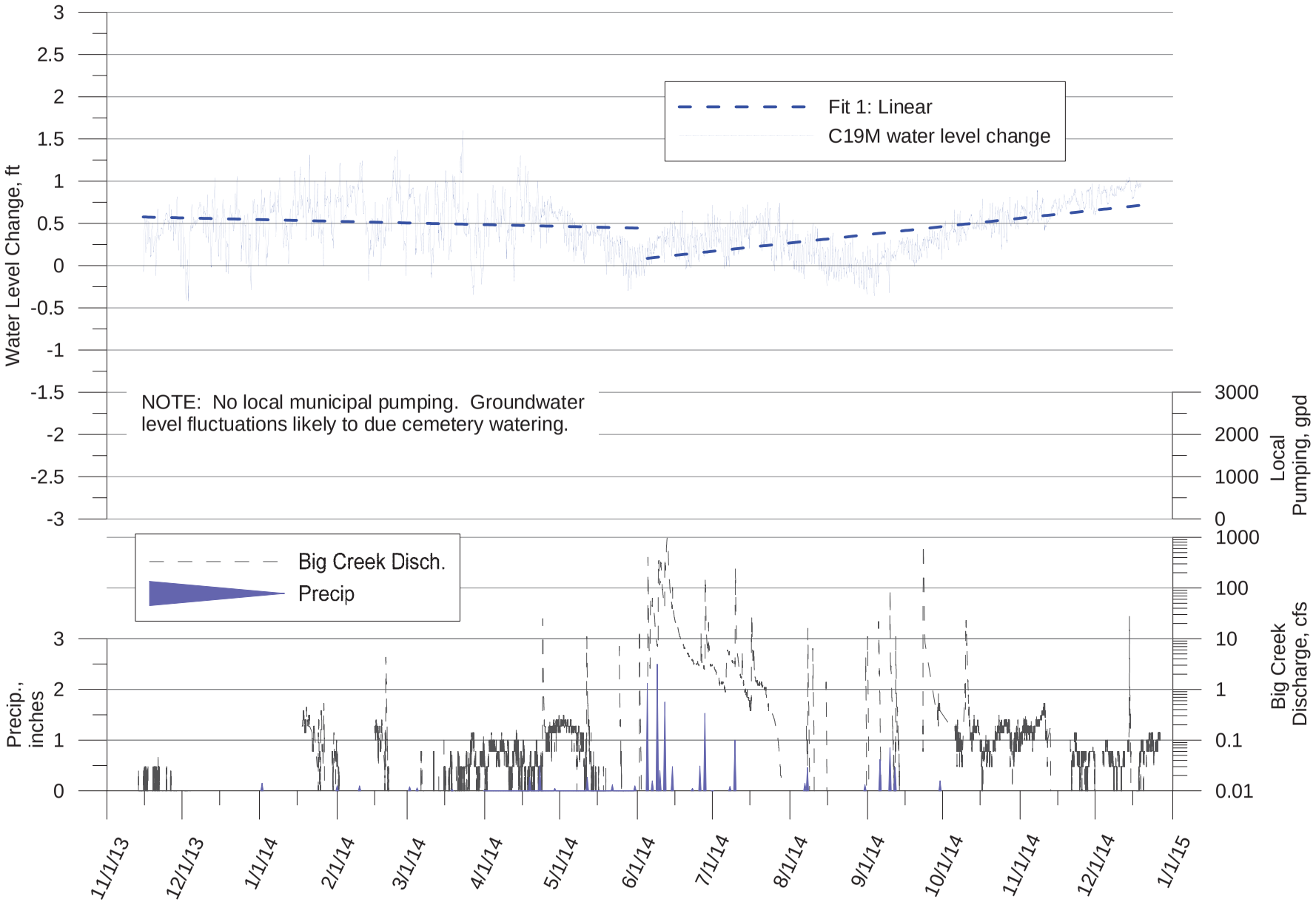
Groundwater Elevation at Monitoring Well C24EM



Local Active Municipal Wells
None (see note below)

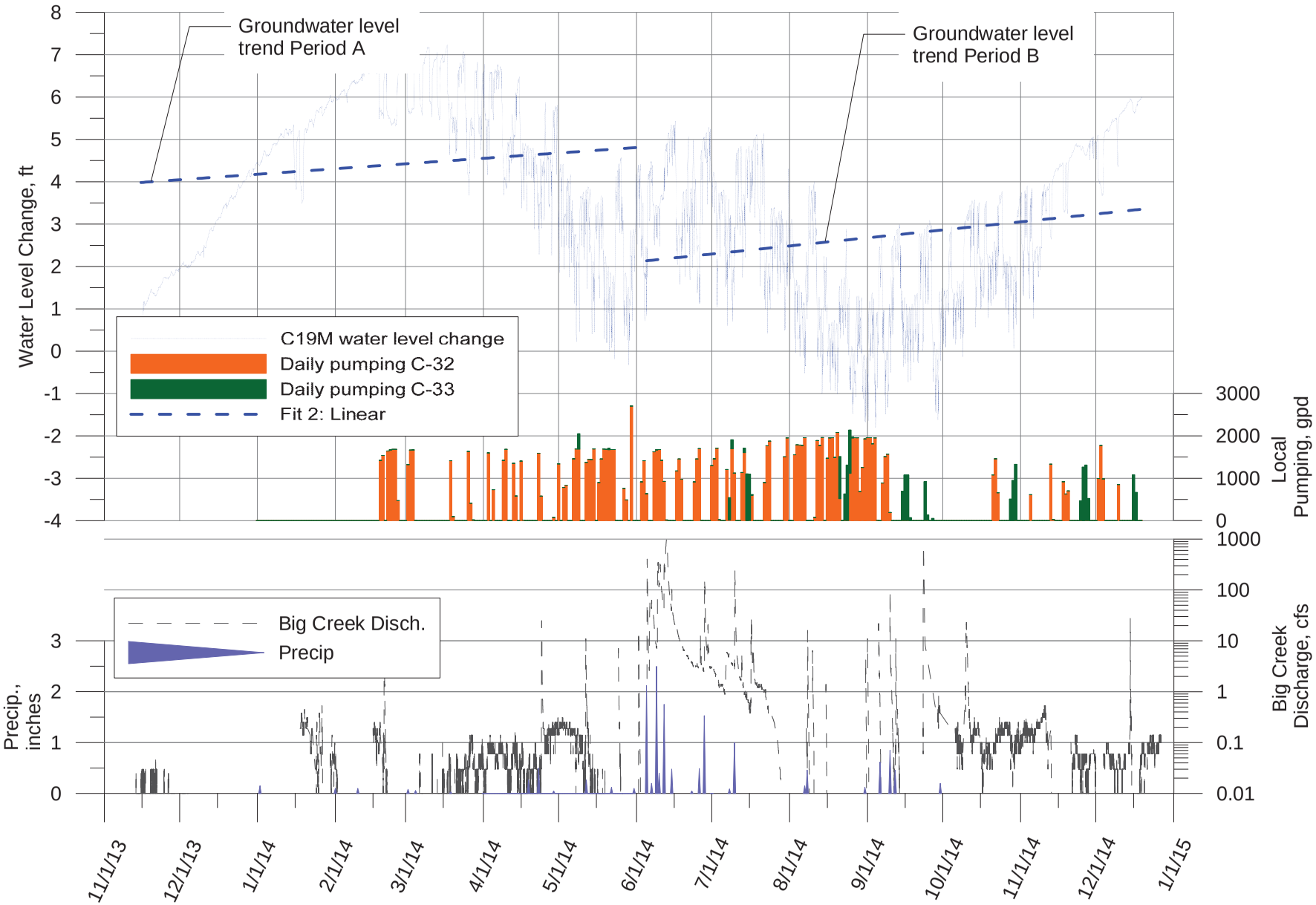
Cemetery MW distance from Big Creek:
approx. 6350 ft east-northeast

Groundwater Elevation at Monitoring Well CEMETERY MW



Local Active Municipal Wells
C-33 - 0.02 MG
C-32 - 0.15 MG
(see note below)

Groundwater Elevations at Monitoring Well C33M1

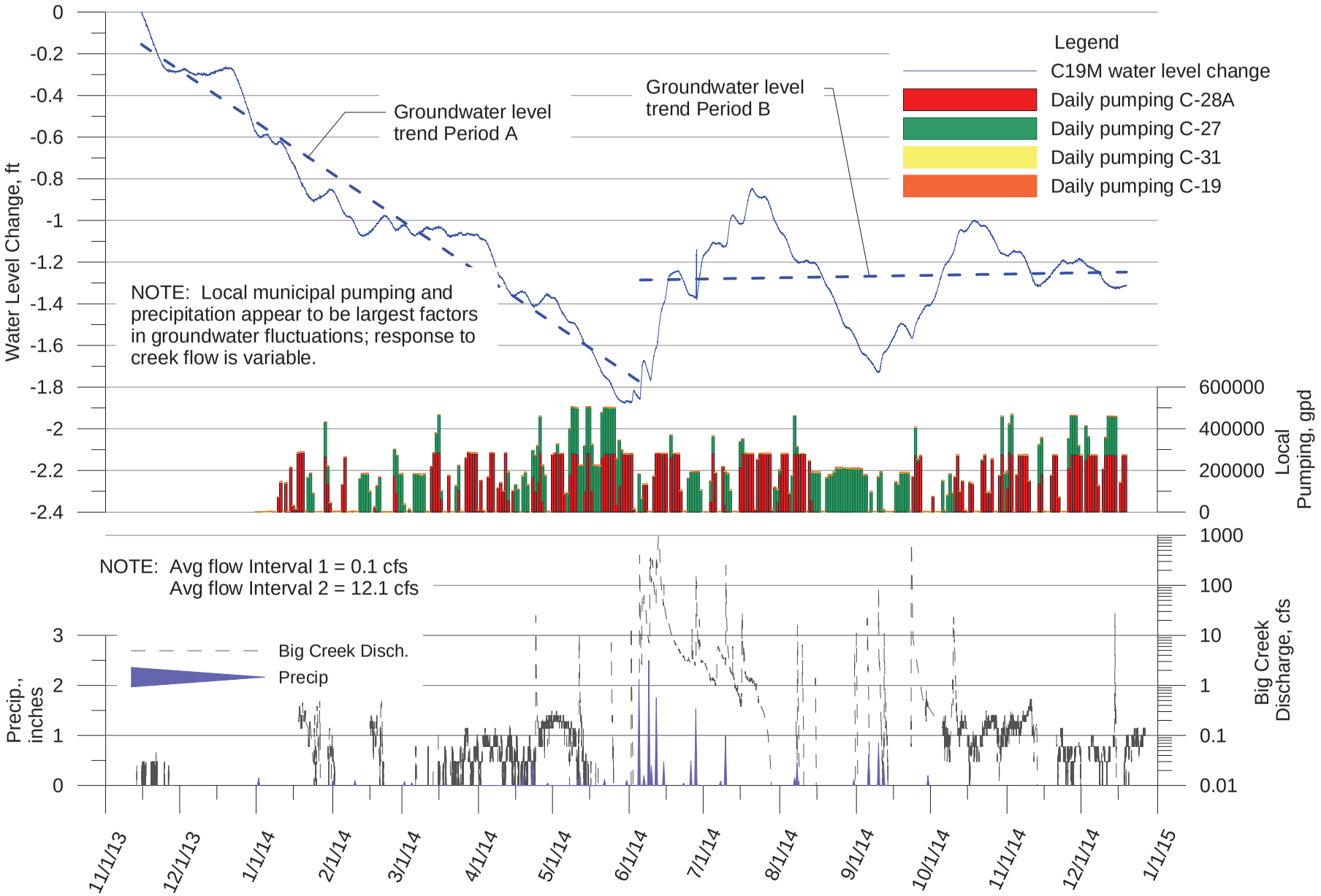


NOTE: Limited local municipal pumping; groundwater fluctuations likely due to nearby golf course irrigation.

C33M1 distance from Big Creek: approx. 3800 ft north-northeast

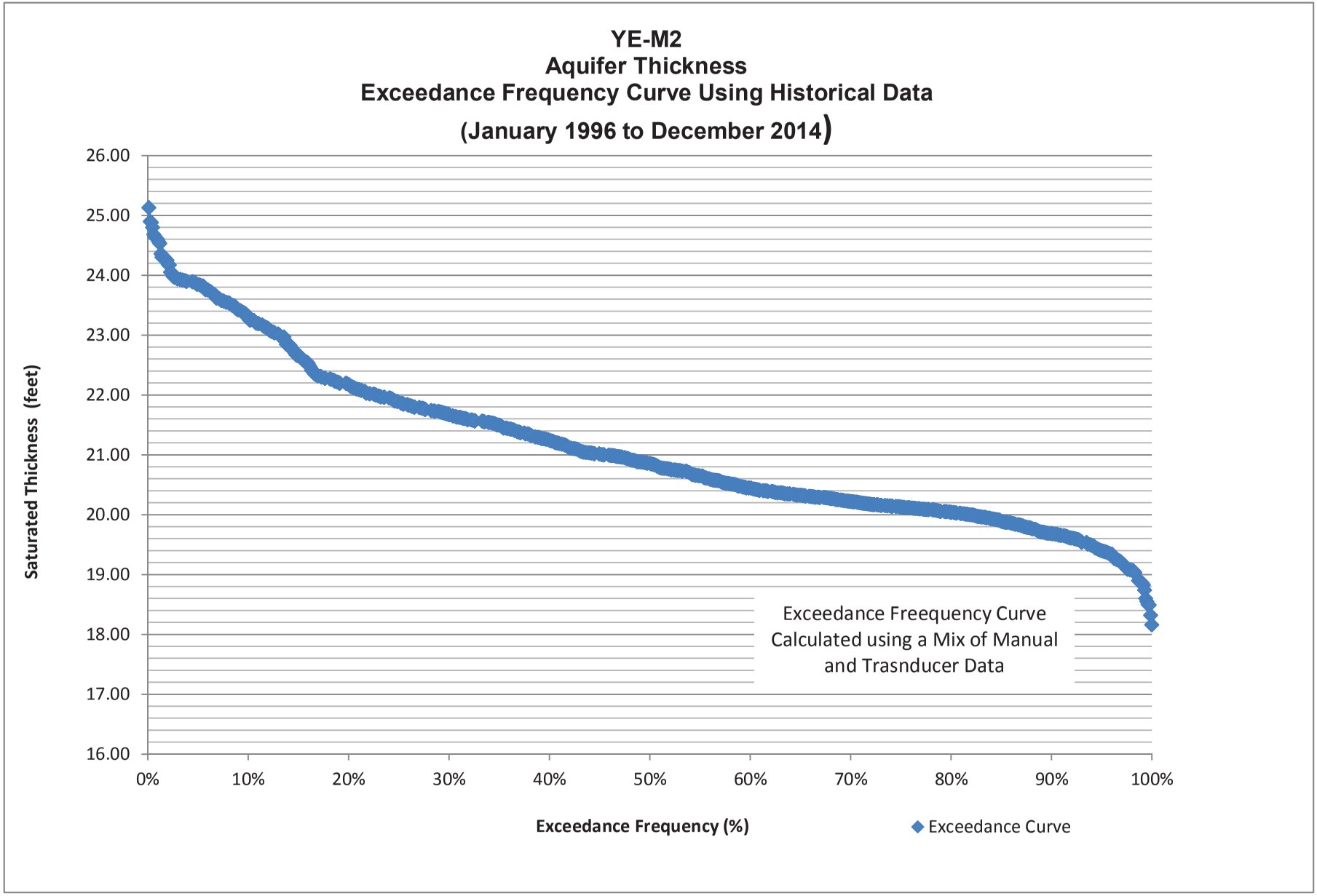
Local Active Municipal Wells
C-19 - 0.2 MG
C-31 - 0.5 MG
C-28A - 36.3 MG
C-27 - 22.7 MG

Groundwater Elevation at Monitoring Well C19M

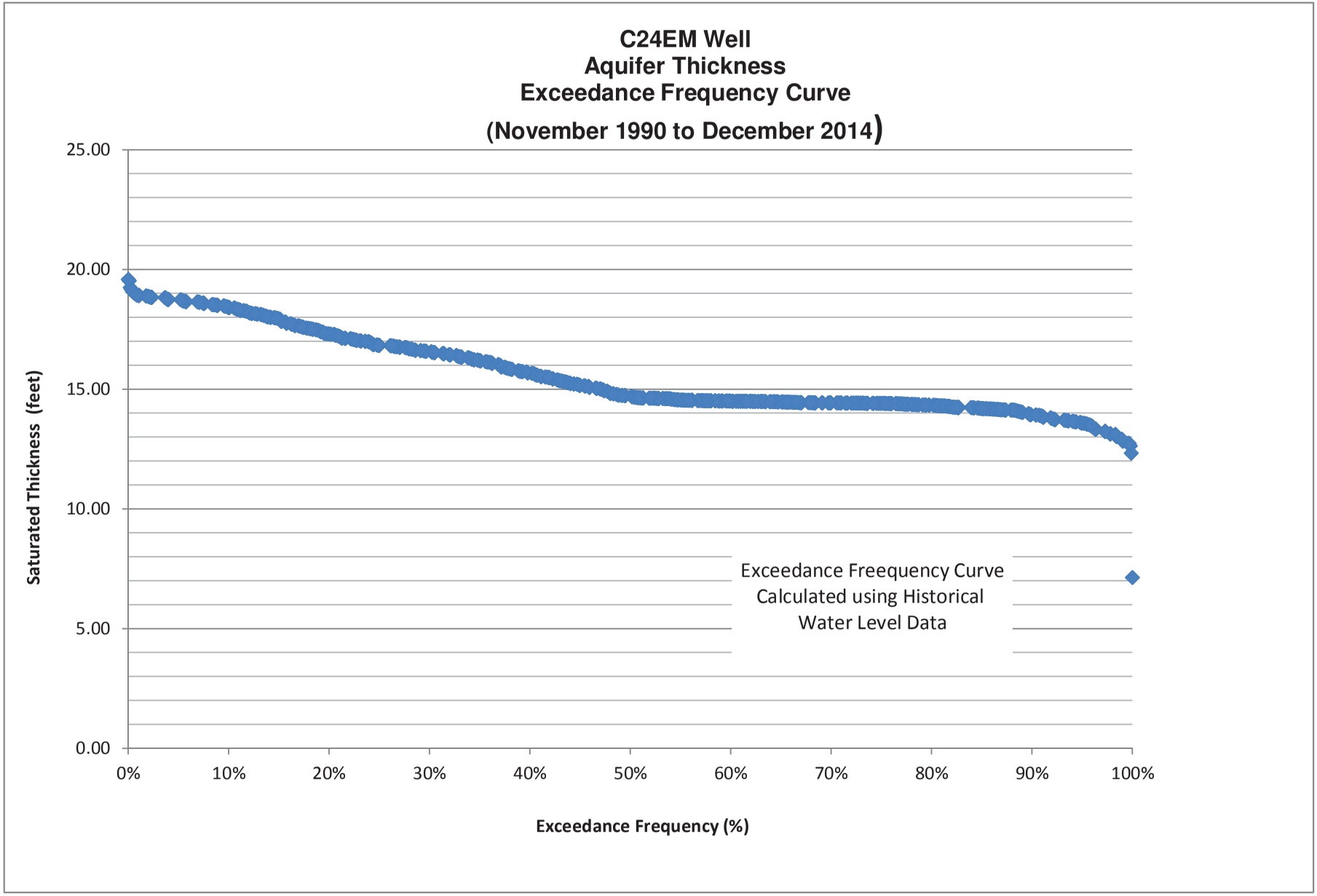


C19M distance from Big Creek: 2033 ft north

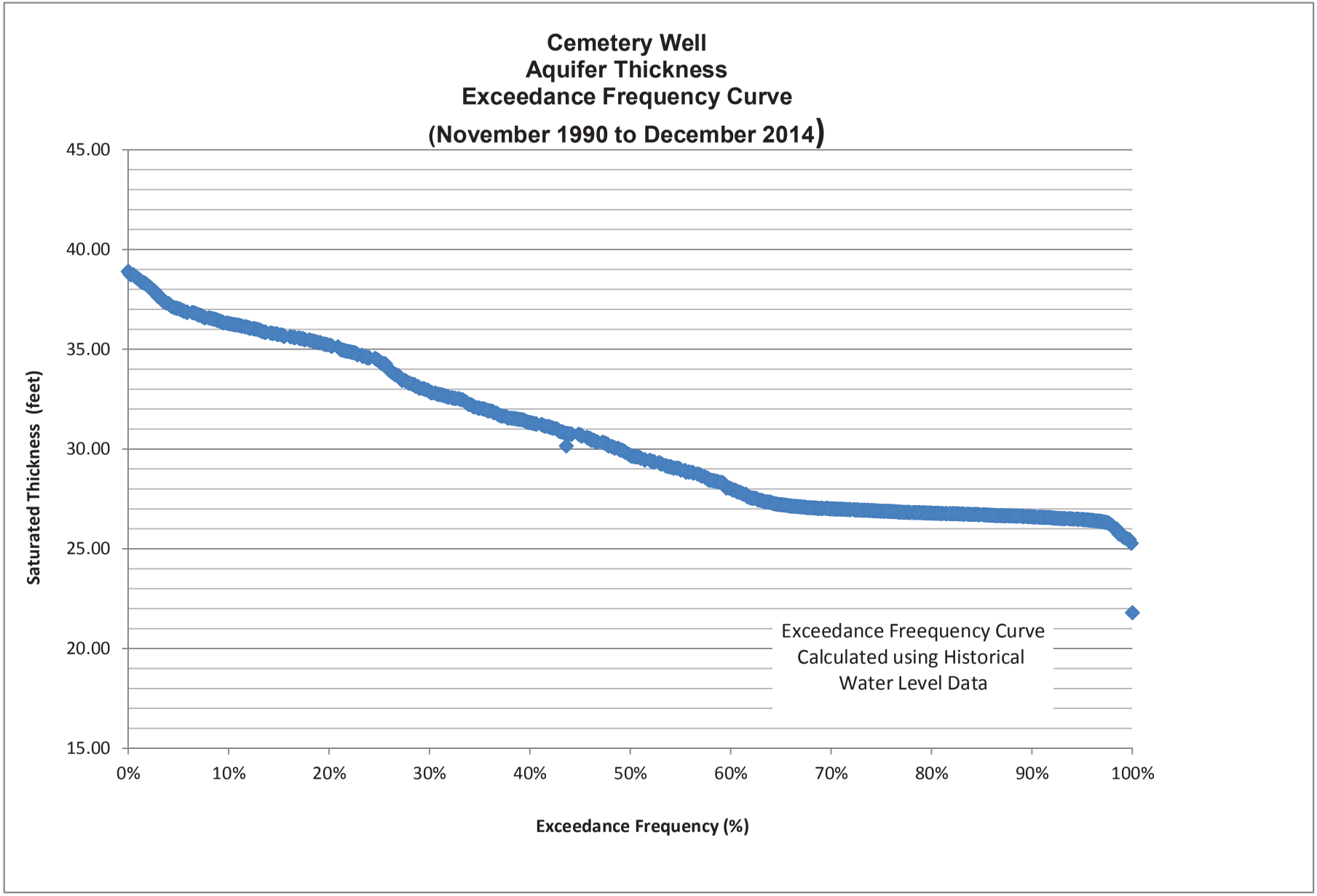
Attachment B – Cumulative Frequency Curves



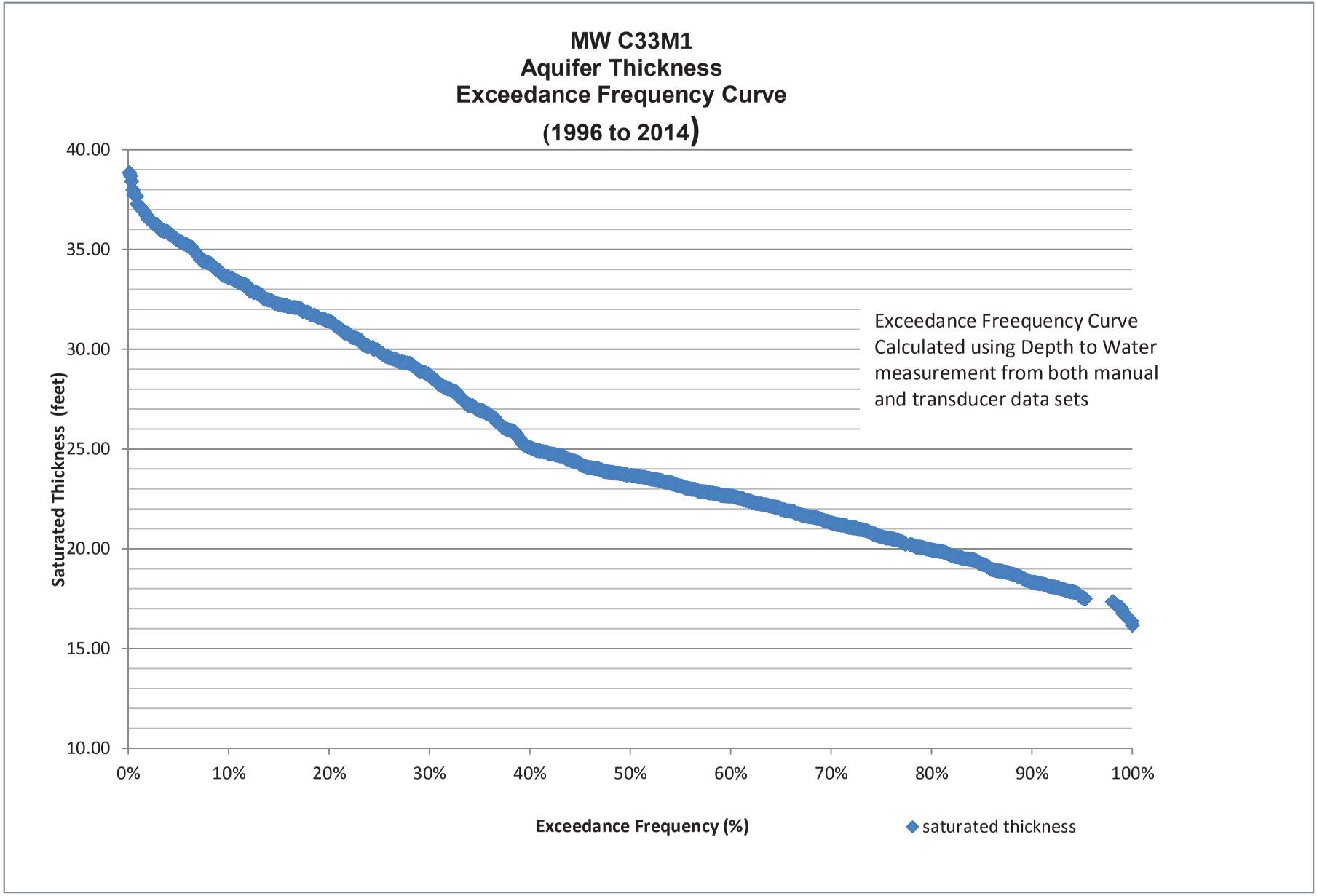
J:\Hays\76652 - Big Creek Phase II\AHI Data\background data\MW freequency curves\MWYE-M2_Frequencey curve.xlsx6/12/2015



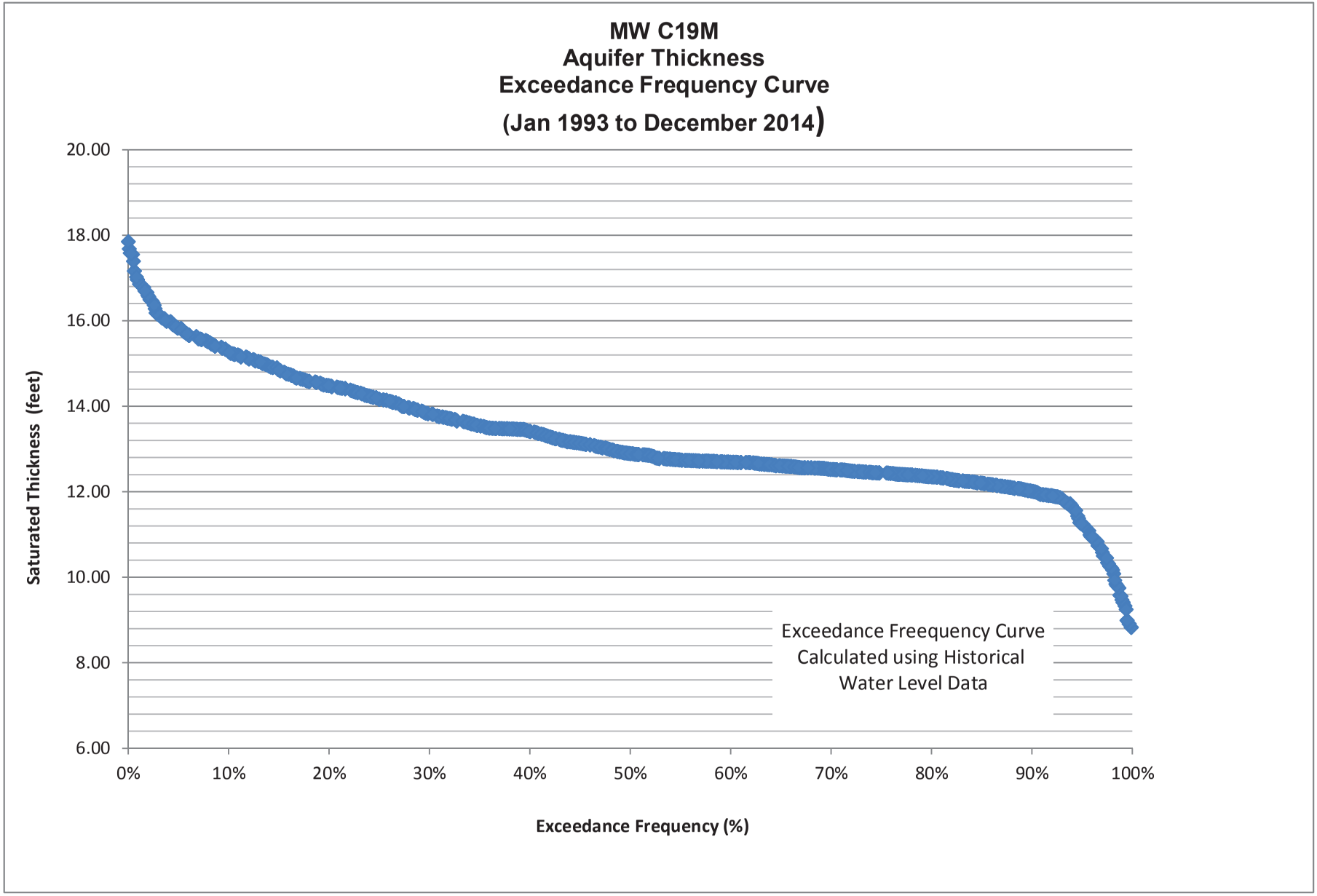
J:\Hays\76652 - Big Creek Phase II\AHI Data\background data\MW freequency curves\C24EM_Frequencey curve.xlsx6/26/2015



J:\Hays\76652 - Big Creek Phase II\AHI Data\background data\MW freequency curves\Cemetary_Frequencey curve.xlsx6/12/2015



J:\Hays\76652 - Big Creek Phase II\AHI Data\background data\MW freequency curves\MWC33M1_Frequencey curve.xlsx6/12/2015



J:\Hays\76652 - Big Creek Phase II\AHI Data\background data\MW freequency curves\MWC19M_Frequencey curve.xlsx6/12/2015

Burns & McDonnell
SINCE 1898

June 15, 2004

Mr. Joe Obholz
Water Division Superintendent
City of Hays
1002 Vine Street
Hays, Kansas 67601

Phase II Report
Smoky Hill Well Field Study
BMcD Project 30159-3.20

Dear Mr. Obholz:

Presented herewith is our letter report on the Phase II investigations for the Smoky Hill River Well Field Study for the City of Hays in accordance with our initial contract dated April 1, 2002 for Phase 1 and Amendment Number 1 dated July 10, 2003 for Phase II. The purpose of the project is to upgrade the Smoky Hill Well Field so that the City's full water right can be developed without significant interference drawdown between wells or with other water users and to maximize use of groundwater in aquifer storage during times of drought.

The Phase I study included review of existing data from City records, review of water right issues, two pump tests at existing wells, groundwater modeling and presentation of a preliminary plan to improve the well field to meet the City's objectives. The Phase 1 interim report presented several alternatives for well field expansion. The City's Well Field committee selected a combination of options that include an expansion to the east and west by relocation several existing wells. The recommendations were presented to the City Commission on June 19, 2003.

Phase II of the study included field investigations to site the wells for the alternatives accepted by the City Commission in the eastern part of the well field, confirmation of sites previously identified for westward expansion and preparation of a capital improvement plan in the form of an opinion of probable cost for the well field improvements.

This letter summarizes the results of the additional field investigations performed to locate suitable well sites on the eastern part of the well field, develop final recommendations for well field improvements, and develop a Capital Improvement Plan with an opinion of probable cost to construct the project

A. Background

The City of Hays' Smoky Hill River well field contains 12 wells that operate under three water rights issued by the Kansas Department of Agriculture, Division of Water Resources. The water right permits are listed below:

File	Status	Priority Date	Wells	Quantity (AFY)	Rate (gpm)	
1,248	Certified	March 2, 1953		1,600	2,000	when operated simultaneously
5,757	Certified	July 3, 1956		900	2,900	(combined with file 1,248)
33,296	Certified	July 19,1979	16 & 17	300	615	
		Original total		2,800		

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

The well field lies within the Smoky Hill Intensive Groundwater Use Control Area (IGUCA). With the creation of the IGUCA, the City's water rights in the Smoky Hill River Well Field were limited to an annual diversion of 2,285 acre-feet per year (AFY). In recent years, due to mutual interference between wells and uncertainties regarding overall safe yield, production was limited to about 1,000 AFY to prevent deterioration of the well field.

In an effort to evaluate the actual yield of the well field under normal and drought conditions and improve/reconfigure the well field to be able to pump the full amount of its authorized water rights, the City initiated a series of investigations and studies. The City was interested in modifying the well field to produce its full water right with minimal interference between wells and other nearby water users. No additional water rights are being requested with these improvements.

B. Previous Studies

Groundwater Associates submitted a report in December 1995 that included recommendations for well rehabilitation and details investigations to locate sites for well replacement. The work included drilling 32 test holes, installing five test wells and conducting limited aquifer tests. The findings of the investigation included proposed locations for two wells southwest of the existing well field. This would expand the well field about ½ mile upstream. This is the basis for the western alternative in Burns & McDonnell's Phase I Report.

Studies by the University of Texas - Dallas (UTD) evaluated the Smoky Hill River watershed and storage capacity of the river alluvium in the Hays well field area. The final report titled *Sustainable Yield from the Smoky Hill River Wellfield, Schoenchen, KS*, is dated November 15, 2002. The report recommended eastward expansion of the well field of approximately 1½ miles in order to capture stored groundwater in times of drought in quantities to sustain the City's basic water supply. The report evaluates the "Historical Drought-Proof Yield" which is an estimate of yield the City could expect in an extended droughts. Subsequent to their report, information was provided by UTD for incremental increases in drought water yield for ½ mile increases in well field expansion. UTD evaluated aquifer conditions at several locations on lands adjacent to the Smoky Hill River in southern Ellis County using surface geophysical methods. Their studies were limited due to right of entry restrictions.

The UTD report is the basis for three of the alternatives presented in Burns & McDonnell's Phase I Report.

The draft Phase I study conducted by Burns & McDonnell, dated June 4, 2003, included review of existing data from City records, review of water right issues, two pump tests at existing wells, groundwater modeling and presentation of a preliminary plan to improve the well field to meet the City's objectives. The Phase I interim report presented the following alternatives for consideration.

- Option 1: An eastward expansion of the well field moving up to ½ mile and the replacement of two existing wells.
- Option 2: An eastward expansion of the well field moving up to 1 mile and the replacement of three existing wells.
- Option 3: An eastward expansion of the well field moving up to 1½ mile and the replacement of three existing wells.
- Option 4: A westward expansion of the well field moving up to ½ mile and the replacement of one existing wells.

Well Field Expansion Options

Option	Number of New Wells	"Historical Drought-Proof" Yield (AFY)[1]	Additional Annual Yield	
			Incremental (AFY)	Total (AFY)
Current Well Field	-	1620	-	-
Option 1	2	1819	199	199
Option 2	3	2060	241	440
Option 3	4	2108	48	488
Option 4	1	-[2]	-	-

Notes:
1 From Dr. Brikowski memorandum to Paul Montoia, December 2, 2002.
2 The UTD study did not evaluate additional storage available with a western expansion.

The City's Well Field committee selected a combination of options (options 2 and 4) that include an expansion to the east moving up to 1 mile and replacing three wells and to the west by moving up ½ mile and replacing one well. The recommendations were presented to the City Commission on June 19, 2003.

C. Phase II Investigations

Burns & McDonnell has completed Phase II of the Smoky Hill River Well Field Study which includes field investigations to determine final locations for well relocation. Initial field activities included drilling at the western expansion locations to obtain samples for grain-size analysis and drilling test holes and a piezometer at a location in the eastern area were the City had right of entry. After right of entry was obtained at additional locations, candidate sites were selected and

tested using Geoprobe methods at 5 selected sites. Subsequently, a test well was installed at one of the sites and a 24-hour constant rate aquifer test was performed.

Preliminary Screening of Sites
Available geological and hydrogeological information from studies, reports, databases, and GIS maps was obtained and reviewed. The information included publications of Kansas Geological Survey (KGS) and water well records from KGS and the City.

Initial test drilling for Phase II was performed between January 13 and January 15, 2004. During Phase II, four test holes and one piezometer were drilled and installed at locations shown in Figure 1. Test holes drilled in the NE ¼ of section 32 served to confirm the geologic conditions at potential well sites identified in a previous study by Groundwater Associates. A Burns & McDonnell geologist was present at the site to supervise the fieldwork and prepare drilling logs for each boring. Soil samples were collected during drilling and grain size analyses were performed on selected samples to provide information for well screen design. Drilling logs and grain size results are presented in Attachments 1 and 2.

Layne Western of Kansas City, Kansas performed all drilling and piezometer construction work using a truck mounted drilling rig and mud rotary techniques. Borehole total depths ranged from approximately 52 to 63 feet below ground surface (bgs). At each location, a 6-inch diameter borehole was drilled to bedrock. A 2-inch diameter PVC piezometer was installed in boring MSTH-04. Following construction, the piezometer was developed using a submersible pump to remove drilling fluid from the area around the well screen and to enhance communication between the piezometer and the aquifer. This development procedure continued until the well water was observed to be clean.

Geoprobe Drilling Work
A total of five (5) areas were selected in the eastern area for Geoprobe testing to screen initial well sites. In each selected area (Figure 2) a series of Geoprobes were drilled in a line generally perpendicular to the major stream valley of the Smoky Hill River.

Geoprobe Testing
Geoprobe testing was conducted along five (5) lines perpendicular to the Smoky Hill River. The work was performed by Plains Environmental Services, Inc. of Salina, Kansas. A BMcD geologist was present to direct the work and to log any soil samples that were collected. Conductivity logs and drilling logs from the Geoprobe testing are contained in Attachments 1 and 3.

Geoprobe Results
Significant thickness of saturated sand and gravel deposits were found during Geoprobe testing at each location with the exception of Geoprobe Line 3, where bedrock was encountered at depths of less than 20 feet below ground surface (bgs). Conductivity profiles of each test line are presented as cross sections in Figures 3, 4, 5, 6 and 7.

Geoprobe data for Lines 1, 2, and 4 indicate the presence of significant sand and gravel deposits. Approximately 43 feet of saturated sand and gravel was encountered in Geoprobe Borings GP1-1 and GP1-2. Approximately 30 feet of saturated sand and gravel was encountered in Geoprobe Borings GP2-1 and GP2-2. Geoprobe Borings GP4-4 through GP4-6 contained approximately 40 feet of saturated sand and gravel. The owner of the land indicated that his former irrigation well (located approximately 100 feet east of GP4-5) is approximately 57 feet deep and pumped 600 gallons per minute (gpm) for extended periods of use.

Soil samples were collected for grain size analyses from Geoprobe Borings GP1-1, GP2-1, and GP4-4 and submitted to Alpha Omega Geotech of Kansas City, Kansas. Results of the grain size analyses are presented in Attachment 2.

Test Well and Piezometer Installation

Drilling for a test well was performed between May 12 and May 20, 2004. During Phase II, two piezometers and one test well were drilled and installed at a location near Geoprobe GP2-1 as shown in Figure 2. A Burns & McDonnell geologist was present at the site to supervise the fieldwork and prepare drilling logs for each boring. The configuration of the test well and piezometers are shown in Figure 8.

Karst Water Well Drilling & Service, Inc. (Karst), of Hays, Kansas performed all drilling and piezometer construction work using a truck mounted drilling rig and mud rotary techniques. At each location, a 6-inch diameter borehole was drilled to bedrock and 2-inch diameter PVC piezometers were installed in each boring. Borehole total depths ranged from approximately 51 to 53 feet below ground surface (bgs). Following construction, each piezometer was developed by air lifting to remove drilling fluid from the area around the well screen and to enhance communication between the piezometer and the aquifer. This development procedure continued until the well water was observed to be clean after starting and stopping the air compressor several times.

Data obtained from Phase I test drilling was used to select a test well location and to design the test well (TW). Karst performed all test well drilling and construction work using mud rotary techniques. At the test hole location, a 10-inch diameter borehole was drilled to bedrock at a depth of 53 feet below ground surface (bgs). Subsequently, the test well was constructed of 5-inch diameter PVC casing with 20 feet of PVC screen with 0.03-inch openings set to a depth of 53 feet. Following construction, the test well was developed first by air lifting and bailing until the water was clear. Additional development was performed by surging and pumping with a submersible pump to remove drilling fluid from the area around the well screen and to enhance communication between the test well and the aquifer. This development procedure continued until the well water was observed to be clean after starting and stopping the pump several times. Total well development time was approximately 6 hours.

Aquifer Testing

Following installation and development of the test well, Karst conducted a 24-hour constant-rate test using a submersible electric pump. Flow rate was measured using an in-line meter. The discharge from the test well was piped to the Smoky Hill River through temporary piping.

The 24-hour constant-rate test was conducted from May 19, 2004 to May 20, 2004. Water level and flow rate measurements were collected during the test at regular intervals in the test well and the piezometers before, during, and at the completion of the 24-hour test period. The data was collected electronically using an In-Situ Hermit 3000 recorder, and manually using electric water level indicators.

Investigation Results

The following describes the results of the piezometer and test well construction and the results of aquifer testing performed at the site.

Piezometer and Test Well Construction

The material encountered in the test borings at the site is Smoky Hill River alluvium consisting of approximately 53 feet of medium- to coarse-grained sand, fine-grained gravel, and scattered boulders with occasional interbedded clay and silt. Bedrock underlying the sand and gravel consists of weathered shale and/or limestone and was encountered at depths ranging from 51 to 53 feet. Pre-test groundwater levels were approximately 10 feet below ground surface (bgs). Table 1 summarizes the piezometer and test well construction data and pre-test water levels. Drilling logs and well construction details for the test well and piezometers are presented in Attachment 1.

Table 1
Test Well and Piezometer Data

Boring Number	Depth to Top of Sand (ft)	Depth to Bedrock (ft)	Depth to Water (ft)*	Saturated Thickness (ft)**
TW1	5	53	11.92	43
OW1	5	53	11.26	43
OW2	0	51	11.01	42

* Below top of casing
** Corrected for casing height above grade

24-Hour Constant Rate Test

A 24-hour constant rate-pumping test was performed as described on Page 5. The average pumping rate during the test was 227 gallons per minute. Water levels changes recorded during the test are presented in Figure 9. In addition, the flow rate in the Smoky Hill River is shown for comparison to water levels measured during the test. In general, water levels recorded electronically closely match those recorded with the electronic water level indicator. Aquifer test data and calculations of aquifer parameters are presented in Attachment 4.

Analysis

Aquifer parameters of transmissivity (T) and storativity (S) were calculated using several methods. These included methods developed by Theis (1935), Cooper and Jacob (1946), and Rorabaugh (1956).

Transmissivity is defined as the rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient. Storativity, also know as the storage coefficient, is the volume of water an aquifer releases or takes into storage per unit surface area of the aquifer per unit change in head.

Analysis results are presented in Table 2. In general, time drawdown analyses will give better indications of aquifer conditions near the pumping well and distance-drawdown analyses give better indications of conditions near the edge of the cone of depression. These analyses are complicated by the effect of recharge from the nearby stream.

Table 2
24-Hour Pumping Test

Time-Drawdown: Theis Method

Well Number	***Transmissivity*** (gpd/ft)	***Storage*** (unitless)
OW1	30,370	0.0005
OW2	35,900	0.0002
Average	**33,135**	**0.0004**

Distance-Drawdown: Cooper-Jacob Method

Time	***Transmissivity*** (gpd/ft)	***Storage*** (unitless)
24-Hours	51,400	0.0016

D. Recommendations

Options selected by the City from the Phase I report included the relocation of four wells to reduce mutual interference and to make use of additional groundwater storage during drought. Subsequent to the option selection, the City requested that additional work be included in the capital improvement package. The expanded work includes the replacement of two additional wells in association with the westward expansion due to continued yield deterioration and the resulting high maintenance costs. Also included is the replacement of the east chlorination facility and equipment, evaluation and replacement or modification of raw water transmission lines within the existing well field and upgrades to the SCADA system.

Geoprobe investigation and aquifer pumping tests have aided in the identification of suitable sites for proposed well relocations. Sites for five wells to be relocated have been selected. Because of on-going maintenance problems the City desires to replace one well at it current location and relocate a second well to the west to reduce drawdown interference.

Because of regulatory restrictions that prohibit a change in "relative priority" of water rights, when replacement wells are drilled downstream, the relative position water rights will have to maintained as currently exist. This means that a well with an older water right cannot be relocated downstream of a younger water right. The proposed well relocations to implement the options selected by the City are shown in Figure 10 and are as follows:

- Well No. 6 to be redrilled upstream approximately ½ mile and renamed 6a.
- Well No. 7 to be redrilled within 50 feet of its current location and renamed 7a.
- Well No. 8 to be redrilled upstream approximately ½ mile and renamed 8a.
- Well No. 15 to be redrilled downstream approximately 1 mile and renamed 15a.
- Well No. 16 to be redrilled downstream approximately 1 mile and renamed 16a.
- Well No. 17 to be redrilled downstream approximately 1mile and renamed 17a.
- Water right for Well No. 12 to be relocated to existing well No. 16 and renamed 12a.
  (Well No. 12 will be maintained as an emergency standby well)

The above described well field modifications and improvements will effectively increase the average well spacing from 1080 feet to an average spacing of 1850 feet thus significantly reduce the potential for drawdown interference. These well field improvements will also increase the length or reach of the well field along the Smoky Hill River from approximately 12,000 feet to 20,000 feet. The increase in the length of the well field will add valuable aquifer storage for use during extended drought periods.

A hydraulic analysis of the well field collection system is recommended to aid in the proper sizing and design of the new piping, pump design and connections to the existing system. The analysis would provide information about the limits of the delivery system and obstacles that may impede delivery of water from the well field improvements.

E. Opinion of Probable Cost

Introduction

Three well alternatives are explored for the City of Hays, Kansas in the well field relocation project. This project has two sections, the West Side and East Side Relocation. The well relocation project does not include the construction of more wells than are currently in place, rather the relocation of existing wells to new locations that are more likely to supply the full amount of water allotted to the City of Hays under their current water rights. The three alternatives include:

- Wells with a submersible pump with a pitless adapter.
- Wells with a vertical turbine pump with a well house.
- Wells with a submersible pump with a well house.

All three alternatives are explored for the East and West Side well relocations. Improvements to the East and West chlorination facilities and the existing raw water transmission line are included in the cost tables as well.

Alternative #1
The first alternative consists of a 500-gpm submersible pump and a pitless adapter. This alternative replaces the need for a well house. The pitless adapter would house the 500-gpm pump and discharge lines to the valve vault. The valve vault houses all valves, meters, and other piping appurtenances underground that are typically found in a well house. An electrical platform is required with this alternative for a power supply, motor control center, and SCADA controls. The estimated opinion of probable cost for this alternative is $3.0 million. A complete list of particular line items and associated costs for both areas can be found in tables presented in Attachment 5.

Alternative #2
The second alternative consists of a 500-gpm vertical turbine pump located in a well house. The well house would include all piping appurtenances, SCADA controls, and power supply connections. This alternative will require enough backfill to raise the base slab elevation equal with the 100-year flood elevation as to avoid flooding issues in the flood plain. The estimated opinion of probable cost for this alternative is $3.0 million. A complete list of particular line items and associated costs for both areas can be found in tables presented in Attachment 5.

Alternative #3 – Recommended Alternative
The third, and recommended alternative, consists of a 500-gpm submersible pump located in a well house. This option is a combination of the previous two alternatives and is consistent with the current setup of wells operating in the well field and will facilitate typical equipment maintenance and well rehabilitation activities. This alternative does not include a pitless adapter, electrical platform, or valve vault. This alternative eliminates the potential need for confined space permitting commonly associated with a valve vault. The equipment associated with this alternative will be located within a well house at each proposed well location. The estimated opinion of probable cost for this alternative is $2.9 million. Further description of how this cost was developed can be found in the following paragraphs and the complete list of all line items and associated costs are presented in Attachment 5. The following description only applies to the third alternative, a 500-gpm submersible pump located in a well house.

Capital Cost Description
The preliminary opinion of capital cost is based on the amount of project detail completed. The further that a project progresses towards final drawings, the greater the accuracy in the estimates. At the preliminary stage, many of the cost estimates are based on general details and concepts.

1. Well Construction & Pump Line Items
   Construction costs are based on a well 60 feet deep. These costs consist of the mobilization, labor, material, and equipment for all drilling and the installation of a stainless steel screen, gravel packing, and steel casing. Well development and testing (test pump installation and consequent well testing) is included in the construction costs. Pump services, such as pump mobilization, demobilization, and installation of a 500-gpm submersible pump, are also included in the construction costs.

Layne-Western has been the preferred service contractor for the existing wells. Assuming that the City of Hays has been pleased with the product's performance and would prefer to continue using their product, the 500-gpm pump cost was derived directly from Layne-Western sales engineers.

2. Well House & Monitoring Well Line Items

   Well house costs are developed from visual inspection, drawings, and photographs of the existing well houses in the well field. However, incorporating a preliminary structural, piping, and electrical layout yields a slightly larger well house dimension than the existing well houses (see Figure 11). The well house cost includes the structural aspects such as foundation work, pre-cast building, and protective coatings. The well house costs also include check and butterfly valves, mag meter, isolation flange, pressure gauge, pressure transmitters, pipe reducers, well level transducer, spool pieces and elbows. This line item is independent of the electrical and transmission costs in the tables.

   Monitoring well costs are derived from recent previous experience on similar jobs. It is recommended that monitoring wells be placed at each new well relocation to observe the activity and impact the new wells will have within their drawdown area.

3. Electrical & SCADA Line Items

   Electrical and SCADA line item costs are developed from recent contact with vendors highly recognizable within their industries and the City of Hays. The East Side SCADA installation consists of wells S-12, -15, -16, -17, and the West Side SCADA installation consists of wells S-6, 7, and -8. Items such as lighting, HVAC, general-purpose items, power distribution equipment, and motor controls are included in the electrical line item.

4. Transmission Line Item

   Transmission costs are developed for a 12-inch diameter pipe and the linear footage of the pipeline as shown in the conceptual piping plan prepared for the West and East Side well relocations (see Figure 12). The transmission plan was developed to minimize the distance between each new well site and existing connections to the City's infrastructure. The East Side does include a line item for two river crossings. The costs associated with this line item are based on a crossing 200 feet long coupled with the cost of pipe for the same length.

5. Site Work Line Item

   The site work costs consist of access roads and backfill for a well house. A gravel access road would be placed along the pipeline easement for the West Side improvements and off the main road directly to the wells for the East Side improvements. A typical site layout can be seen in Figure 13. The amount of backfill for each well site consists of a buildup four feet high with a 10:1 entrance slope and a 4:1 slope for the remaining three sides. The proposed 2-acre well site provides sufficient lay-down area for equipment and material during construction. The costs associated with the backfill include only the

transportation of said backfill to each location. It is assumed that the City has sufficient backfill material in stock to accommodate each well site.

Right of way and land acquisition is not included in the probable project cost tables. It is understood that once construction commences, all property will have been acquired directly by the City. A power supply line item is included in the tables but no costs have been asserted due to the power service area the West and East Side well relocations lie in. On going talks with the respective power companies have taken place but no final course of action has been determined.

6. Demolition Line Item

   Demolition costs include all debris or material to be loaded and hauled to a site for proper disposal and plugging the existing well. Demolition activities will not begin until the City has completed equipment salvage operations. The West Side well relocation involves the complete demolition of existing well S-6, S-8, and partial modifications to S-7. The proposed S-7 well house will continue to use the power supply and pipeline from the existing S-7 well house due to its close proximity (approximately 50 feet), but the well still needs to be plugged. The existing S-8 well house needs to be plugged and demolished, but the power supply will remain in service as a future power connection from the proposed S-6 and S-8 wells. For simplicity, the demolition line item cost for the West Side includes the complete demolition of 2 wells. The East Side demolition line item includes wells S-15 and S-17. The existing S-12 well will remain intact as a backup unit for the City.

7. Chloriantion Facility Line Items

   The West Side Chlorination Facility improvements include new SCADA equipment only. The East Side Chlorination Facility improvements include the demolition of the existing facility and construction of a new building, new equipment, and SCADA controls. The SCADA costs are developed directly from the R.E. Pedrotti Company, Inc. The chlorination equipment cost and prefabricated building are developed directly from the Ray Lindsey Company and the scrubber costs are developed directly from US Filter.

8. Contingencies & Other Costs

   Opinions of project cost are based on construction and other cost allowances including contingency, engineering, surveying, legal and other related costs are summarized in the attached tables. Unit cost data and component cost information for the proposed improvements are based on historical projects and vendor's cost information.

   Project costs include construction costs, contingencies, and other costs. A contingency of 25 percent plus other costs at 25 percent is added to the opinions of probable cost. Contingency covers items that are not anticipated, changes in condition, or other factors that may increase the cost.

   Other costs accounts for technical, professional, and special services are required to execute the project. These include environmental, technical, and geotechnical studies,

design and resident engineering fees, construction material testing, legal fees, project insurance, land surveying and legal descriptions, project design surveying, operation and maintenance manuals, and personnel training.

Land and right-of-way costs for each improvement are not included in the cost opinions.

These order-of-magnitude cost opinions are based on experience and judgement as a professional consultant combined with information from past experience, vendors, and published sources, such as Means. The line item costs are based on an Engineering News Record Construction Cost Index of 7111.60 for Kansas City for May 2004. Since Burns & McDonnell has no control over weather, cost and availability of labor, material and equipment, labor productivity, construction contractor's procedures and methods, unavoidable delays, construction contractor's method of pricing, economic conditions, government regulations and laws, competitive bidding or market conditions and other factors affecting such opinions or projection, Burns & McDonnell does not guarantee the actual rates, costs, etc. will not vary from the opinions and projections developed herein.

Schedule

Given the scope and details of the project thus far, a preliminary schedule was prepared. The proposed schedule is aggressive and has a 12 to 13-month duration (design-bid-build approach) beginning as soon as mid-July 2004 in order to have the improvements operational in July 2005. The proposed schedule is included as Attachment 6.

The schedule consists of four main activities; the notice to proceed, finalize lease/purchase agreement, water rights application and verification, final design and construction. It is important to emphasize that this schedule is by no means all-inclusive or final and the estimated amount of time to complete each activity may change once construction commences due to unforeseen events or other dilemmas. Other activities may have to be added once construction begins as these items reveal themselves.

We appreciate the confidence you have placed in us to assist you in improving and ensuring the reliability of your groundwater source of supply for the City of Hays. The assistance provided by the staff of the City of Hays during the course of this study is greatly appreciated. The project team remains ready to discuss the details of this report at your convenience. If you have any questions or comments, please contact me at 316-941-3921 or David Stous at 816-822-3088.

Sincerely,

Brian Meier
MMR

Brian Meier,
Project Coordinator

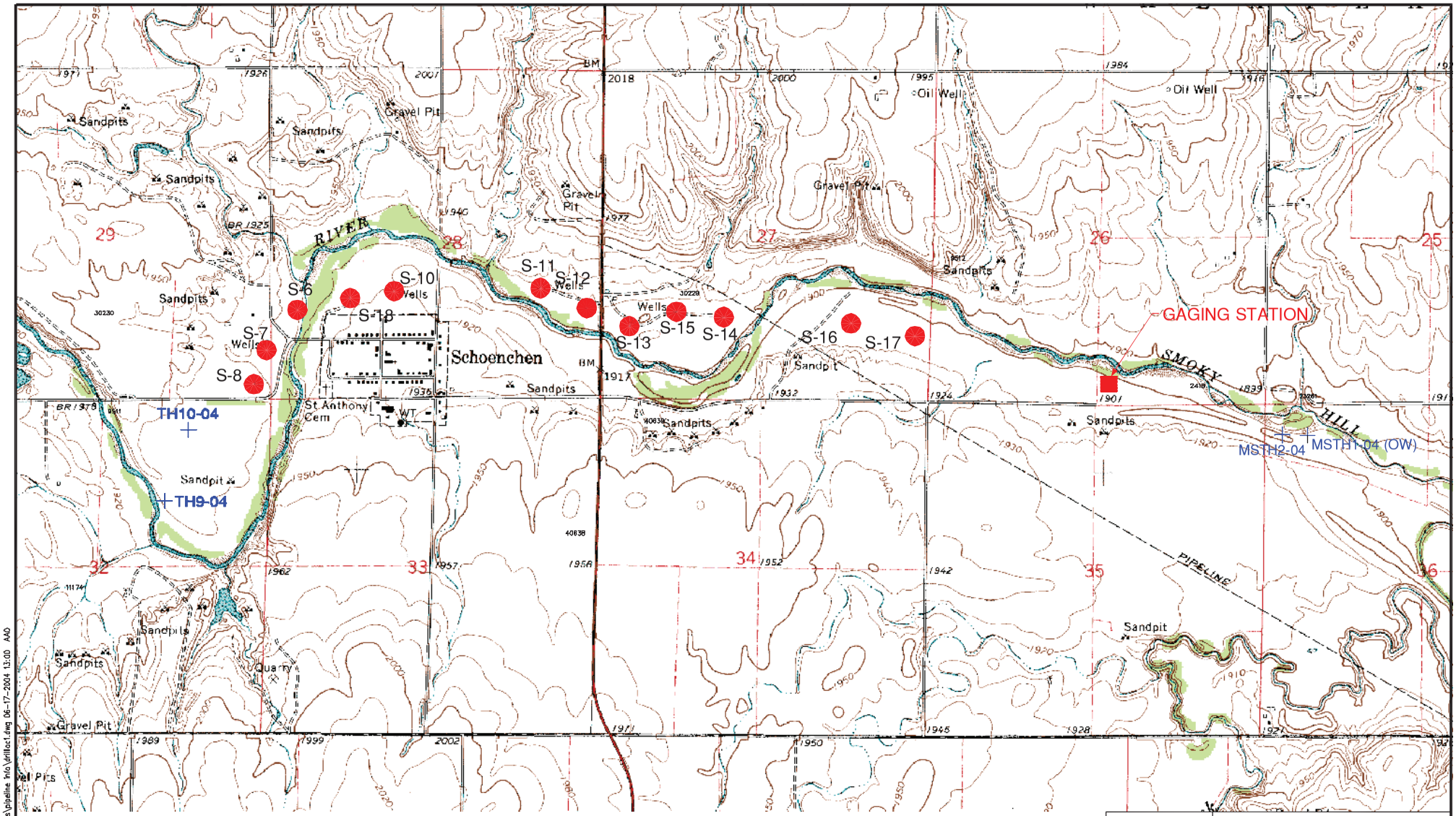
Robert Jaques, R.G.
Hydrogeologist

ROBERT C. JAQUES
LICENSED
580
KANSAS
GEOLOGIST

David Stous, P.E., P.G.
Hydrogeologist

cc Pat Higgins

Figures



LEGEND

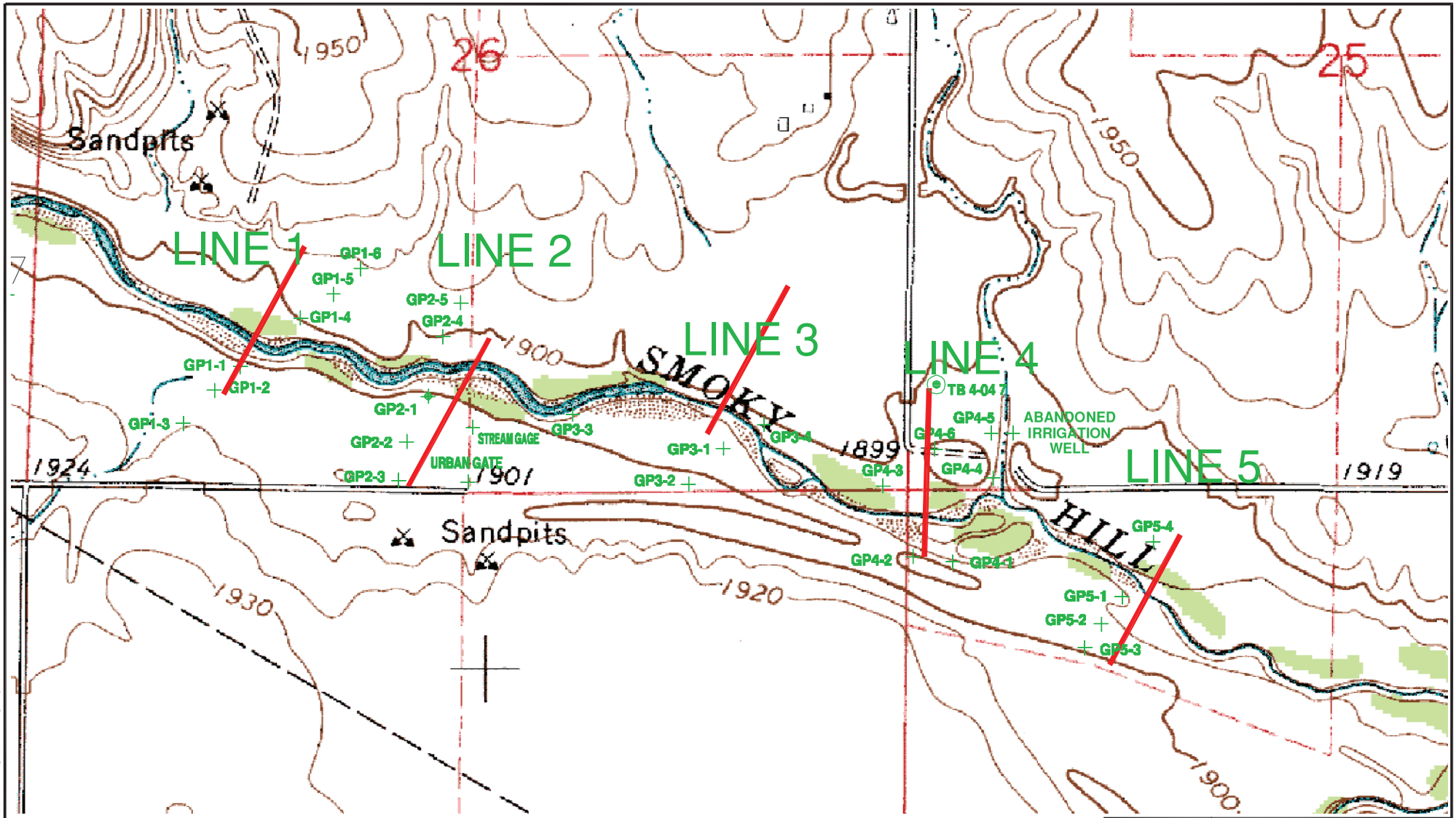
S-8 EXISTING CITY WELL

TH9-04 TEST BORING LOCATION

Figure 1

SITE MAP

J:\Hays\30159\drawings\pipeline Info\drillloc1.dwg 06-17-2004 13:00 AAO



LEGEND

GP1-1 + GEOPROBE BORING LOCATION AND NUMBER

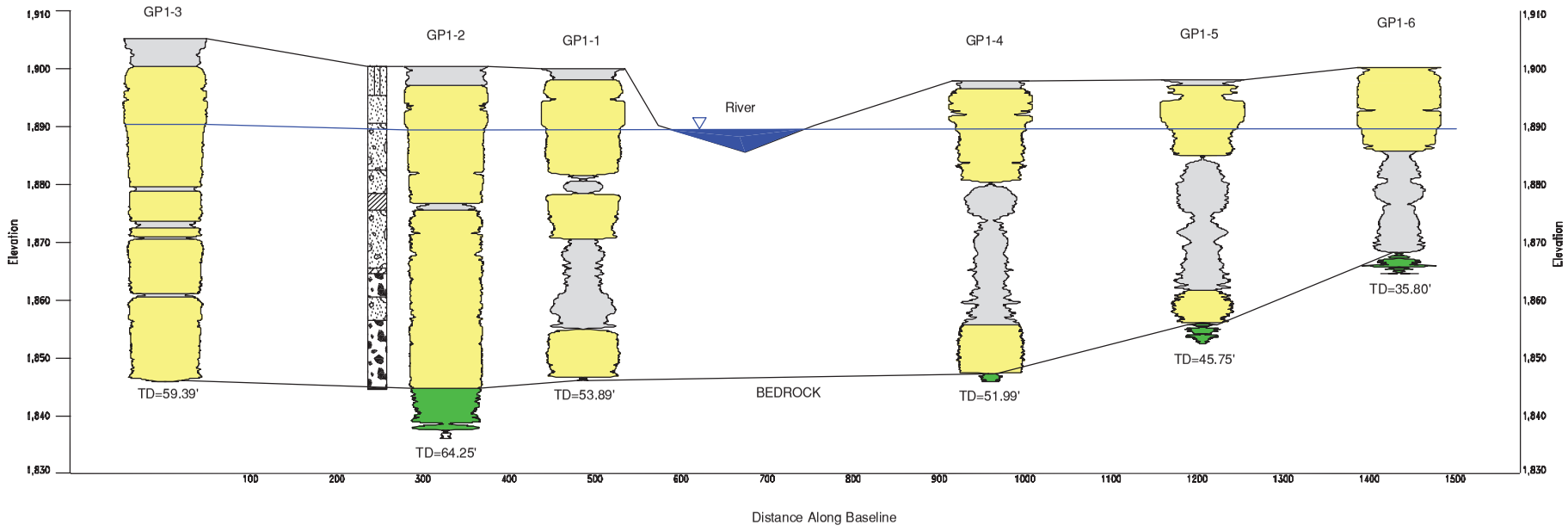
✦ TEST WELL LOCATION

◉ TEST HOLE

Figure 2

GEOPROBE AND TEST WELL LOCATIONS

J:\Hoya\30158\drawings\pipeline info\geoprobe borings.dwg 06-17-2004 13:02 AAO



LEGEND

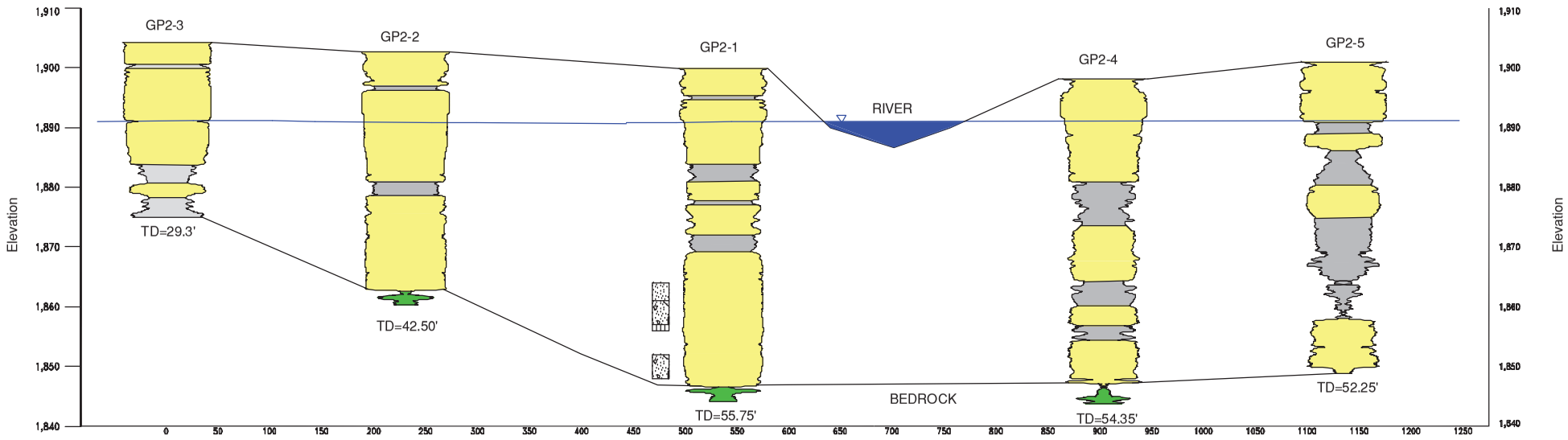
- SAND AND GRAVEL
- INTERBEDDED SAND, SILT, AND CLAY
- SHALE BEDROCK

TD TOTAL DEPTH

Burns & McDonnell

Figure 3
GEOPROBE LINE 1

J:\Hays\30159\2004drilling\GPdata\LINEGP1.DWG 06-17-2004 11:08 aao

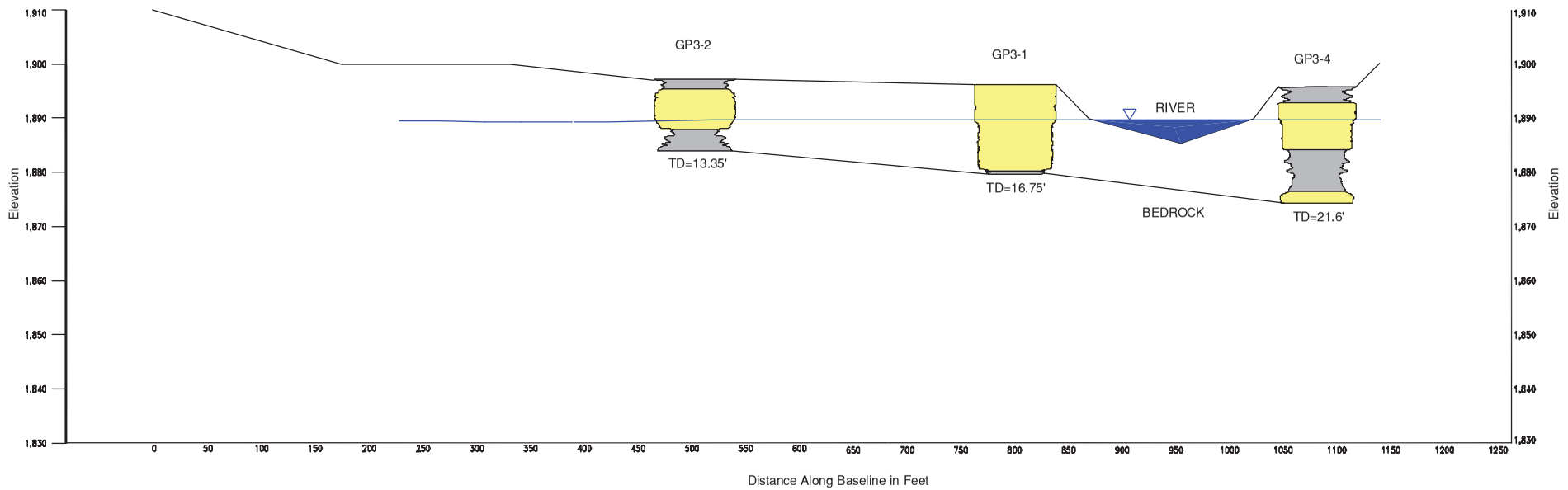


LEGEND

- SAND AND GRAVEL
- INTERBEDDED SAND, SILT, AND CLAY
- SHALE BEDROCK
- TD TOTAL DEPTH

Figure 4
GEOPROBE LINE 2

J:\Hays\30159\2004drilling\GPdata\GPLINE2.dwg 06-17-2004 11:10 AAO

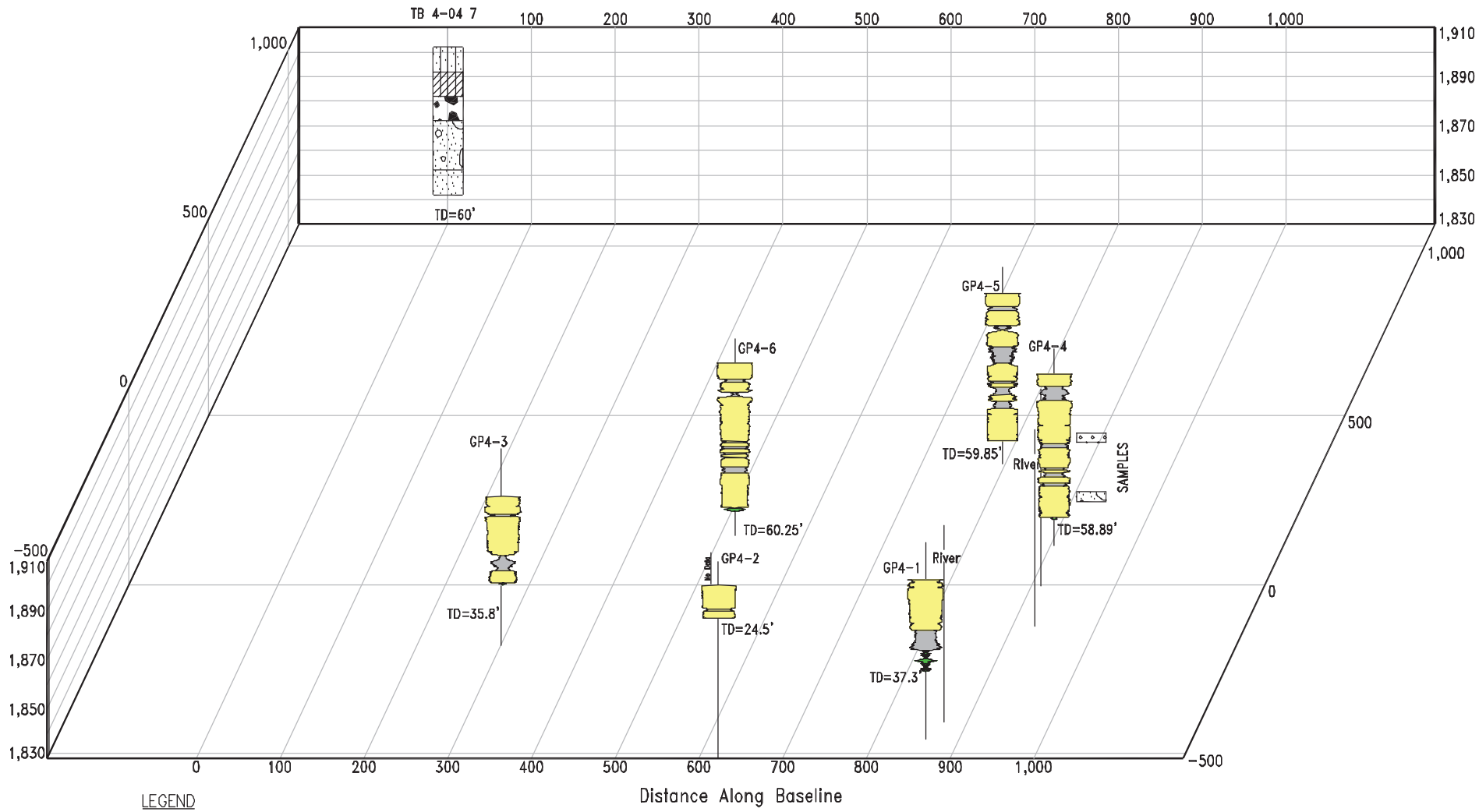


LEGEND

- SAND AND GRAVEL
- INTERBEDDED SAND, SILT, AND CLAY
- SHALE BEDROCK
- TD TOTAL DEPTH

Figure 5
GEOPROBE LINE 3

J:\Hays\30159\2004drilling\GPdata\gpline3.dwg 06-17-2004 11:11 AAO



LEGEND

- SAND AND GRAVEL
- INTERBEDDED SAND, SILT, AND CLAY
- SHALE BEDROCK
- TD TOTAL DEPTH

Figure 6
GEOPROBE LINE 4

J:\Hays\30159\2004drilling\GPdata\gpline4.dwg 06-17-2004 11:12 AAO

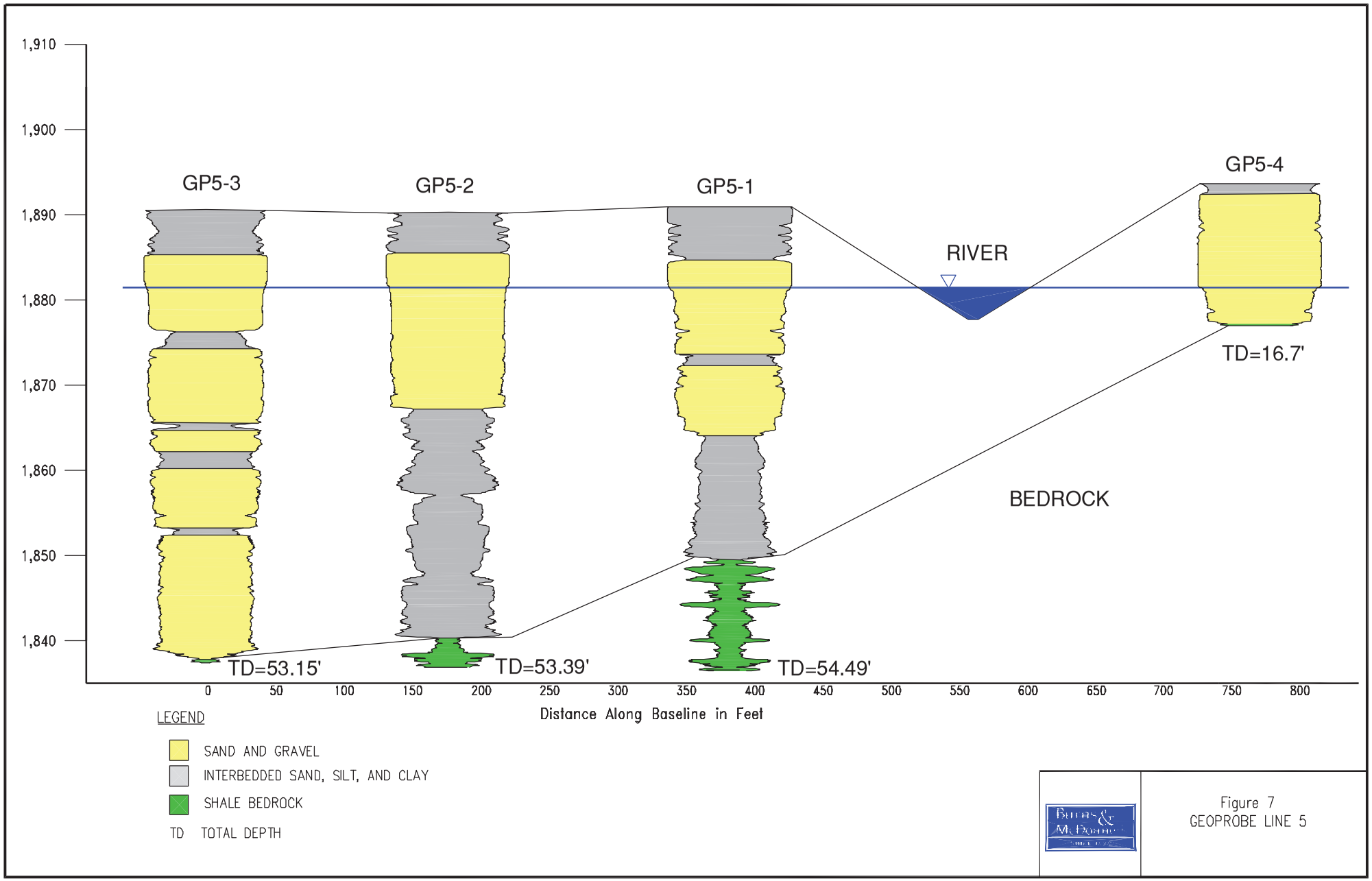
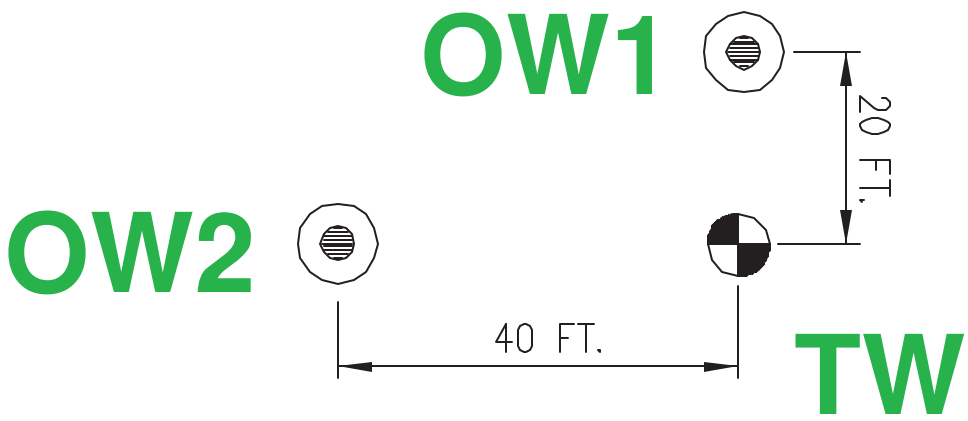


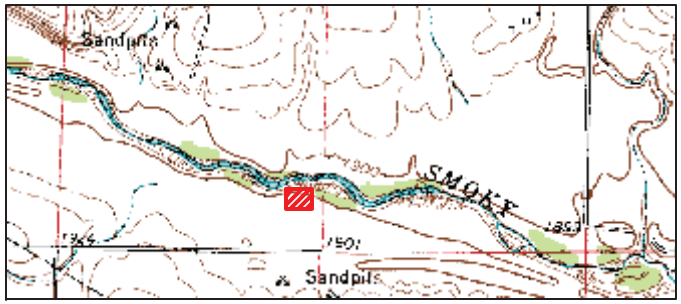
Figure 7
GEOPROBE LINE 5

J:\Hays\30159\2004drilling\GPdata\gpline5.dwg 06-17-2004 11:14 AA0

J:\Hays\30159\drawings\pipeline info\TESTWELLborings.dwg 06-21-2004 09:00



SITE LOCATION



LEGEND

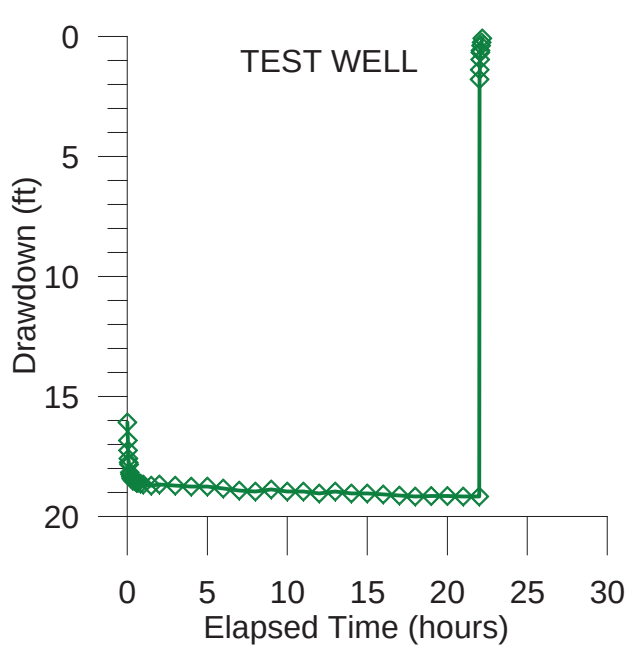
OW1 OBSERVATION WELL LOCATION

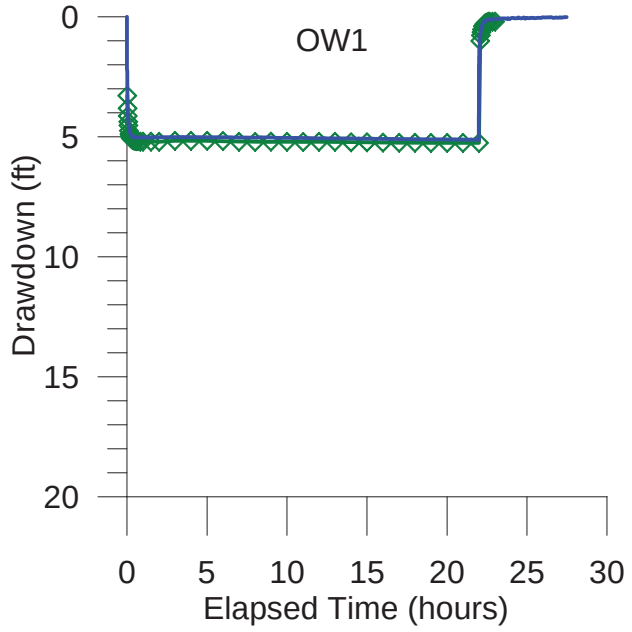
TW TEST WELL LOCATION

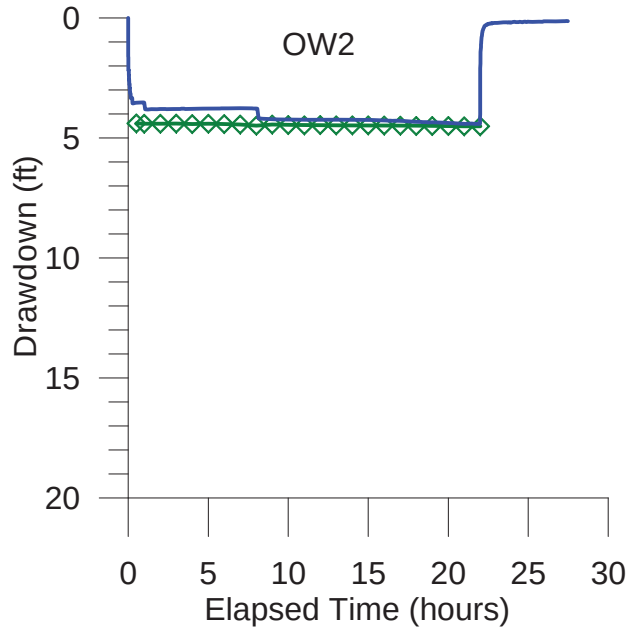
Burns & McDonnell

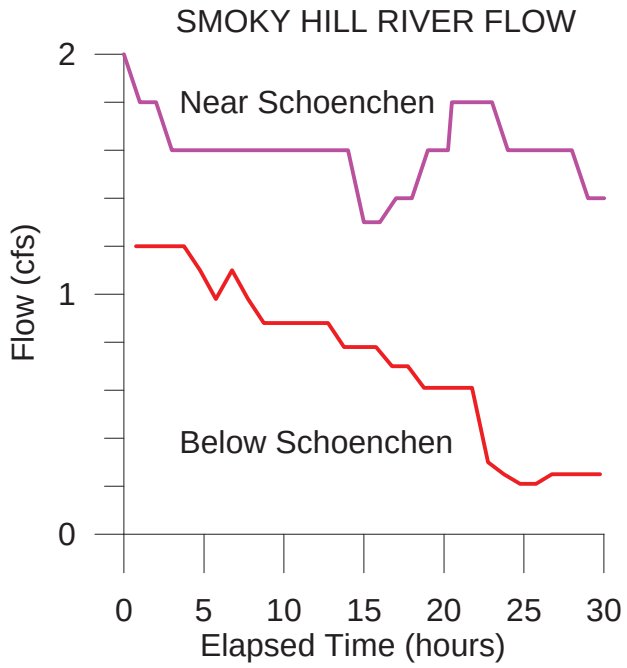
Figure 8

TEST WELL AND OBSERVATION WELL CONFIGURATION









LEGEND

Manual Data

Electronic Data

Burns & McDonnell
SINCE 1898

Figure 9
TIME-DRAWDOWN
AFTER 24 HOURS

24hrtest.GRF 10/14/04

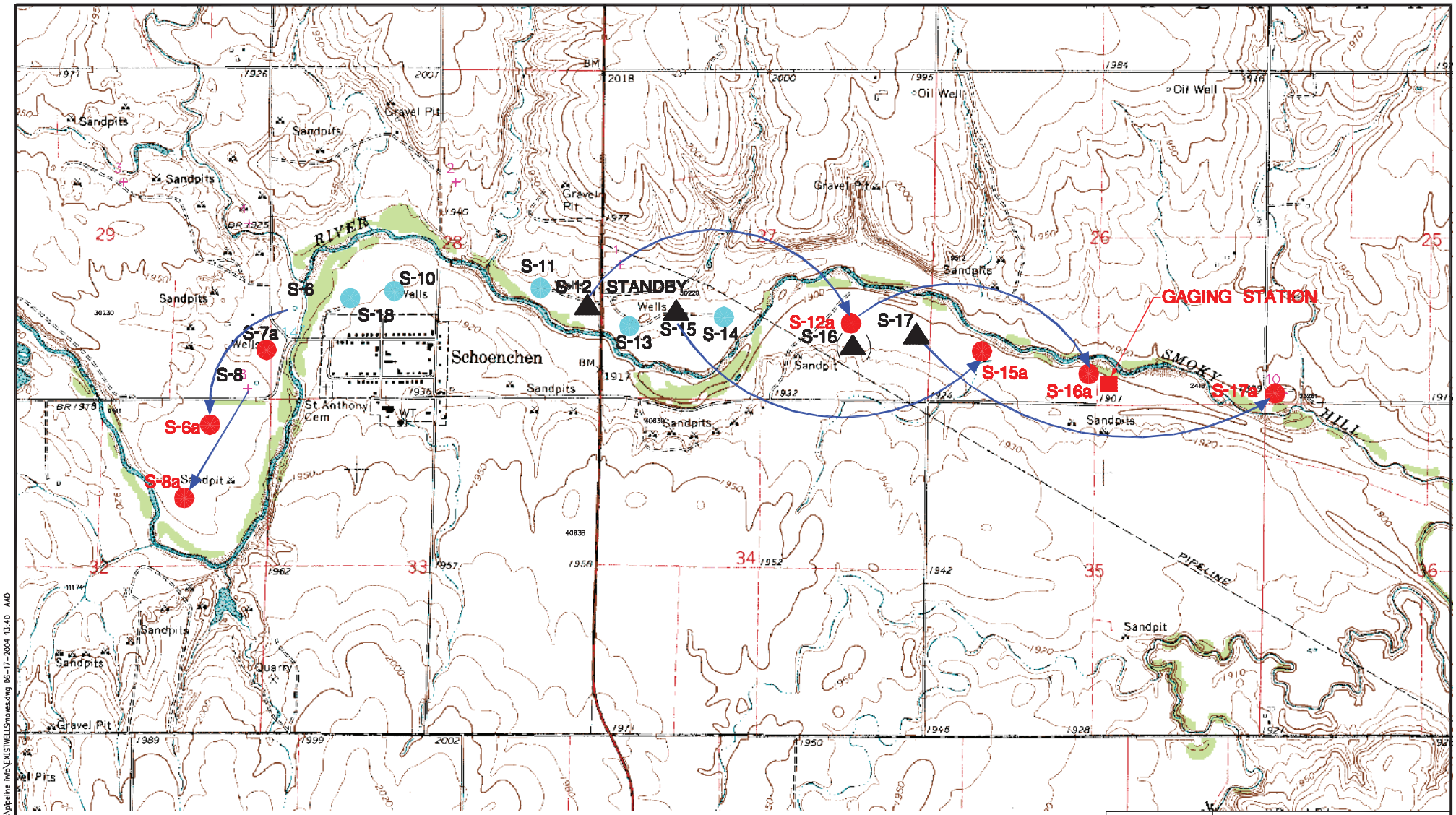
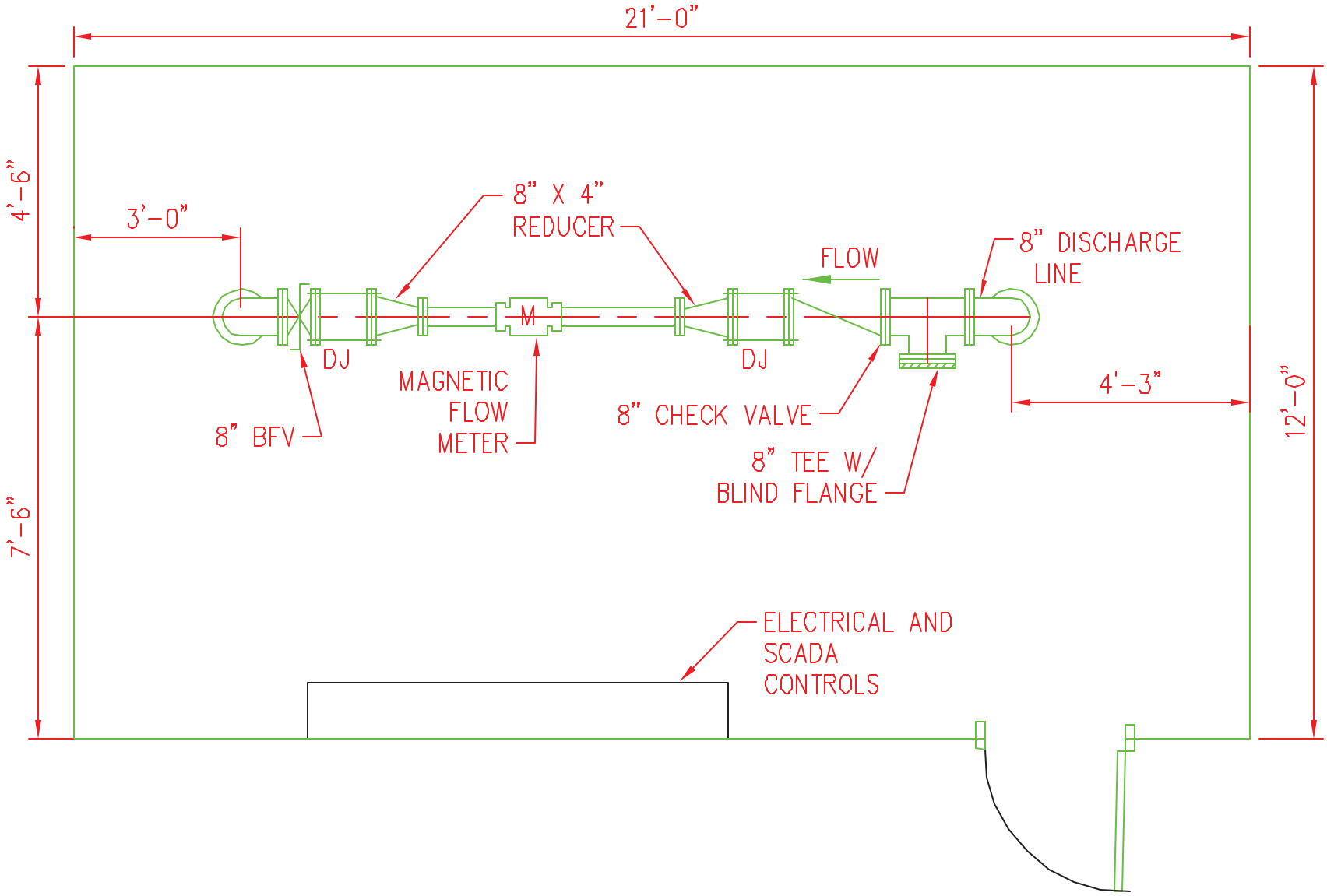


Figure 10

PROPOSED WELL RELOCATION

Burns & McDonnell

J:\Hays\30159\drawings\pipeline info\EXISTWELLSmoves.dwg 06-17-2004 13:40 AAD

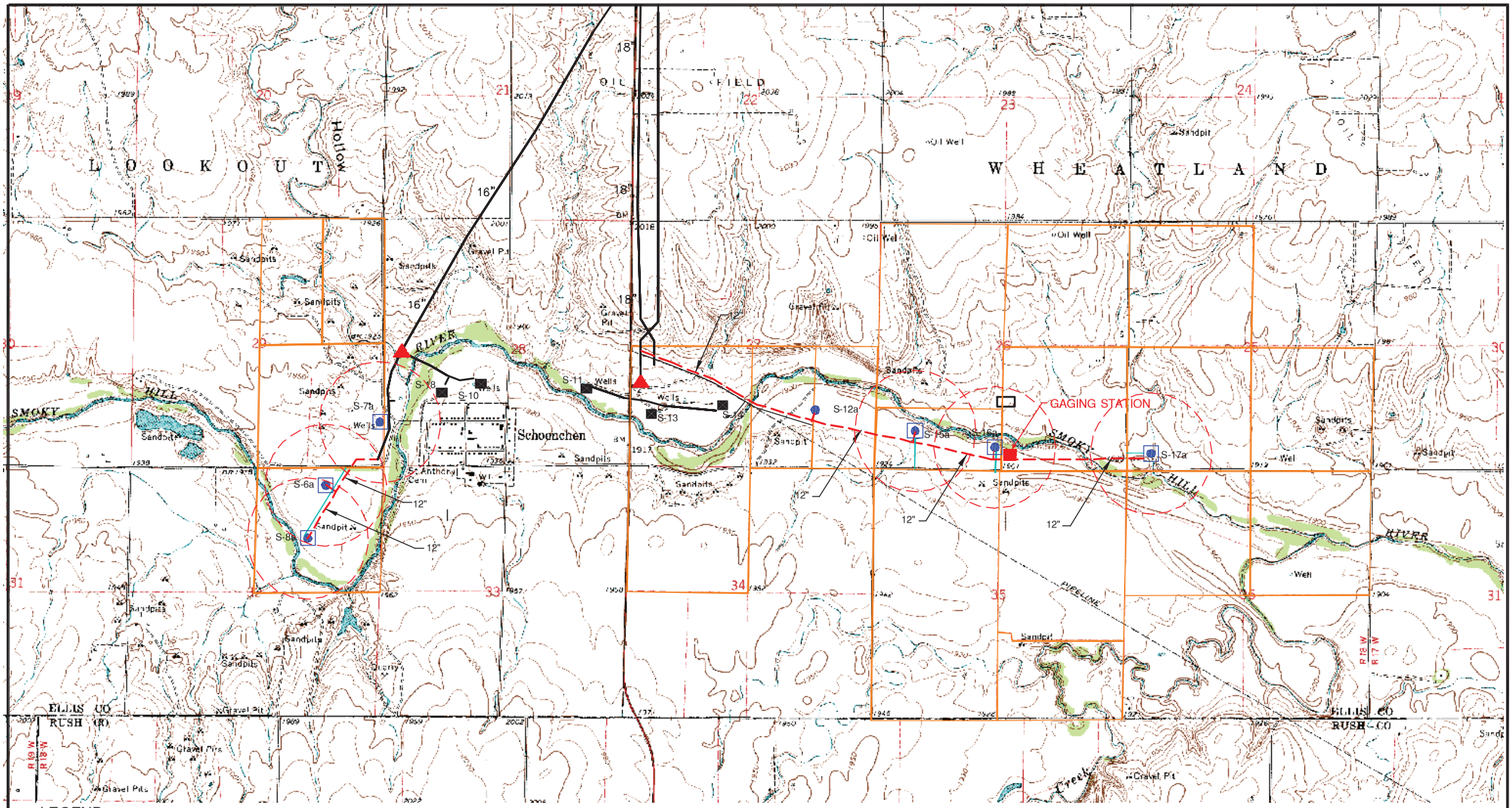


NOT TO SCALE

Burns & McDonnell

Figure 11

TYPICAL WELL HOUSE SCHEMATIC



LEGEND

- PROPOSED WELL
- EXISTING WELL
- PROPOSED PIPELINE
- PROPOSED ACCESS ROADS
- EXISTING PIPELINE
- PROPOSED WELL SITE ACQUISITION – 2 ACRES
- CHLORINATION BUILDING
- LAND OWNERSHIP
- 1/2 MILE CIRCLE

N

2000 0 2000 4000

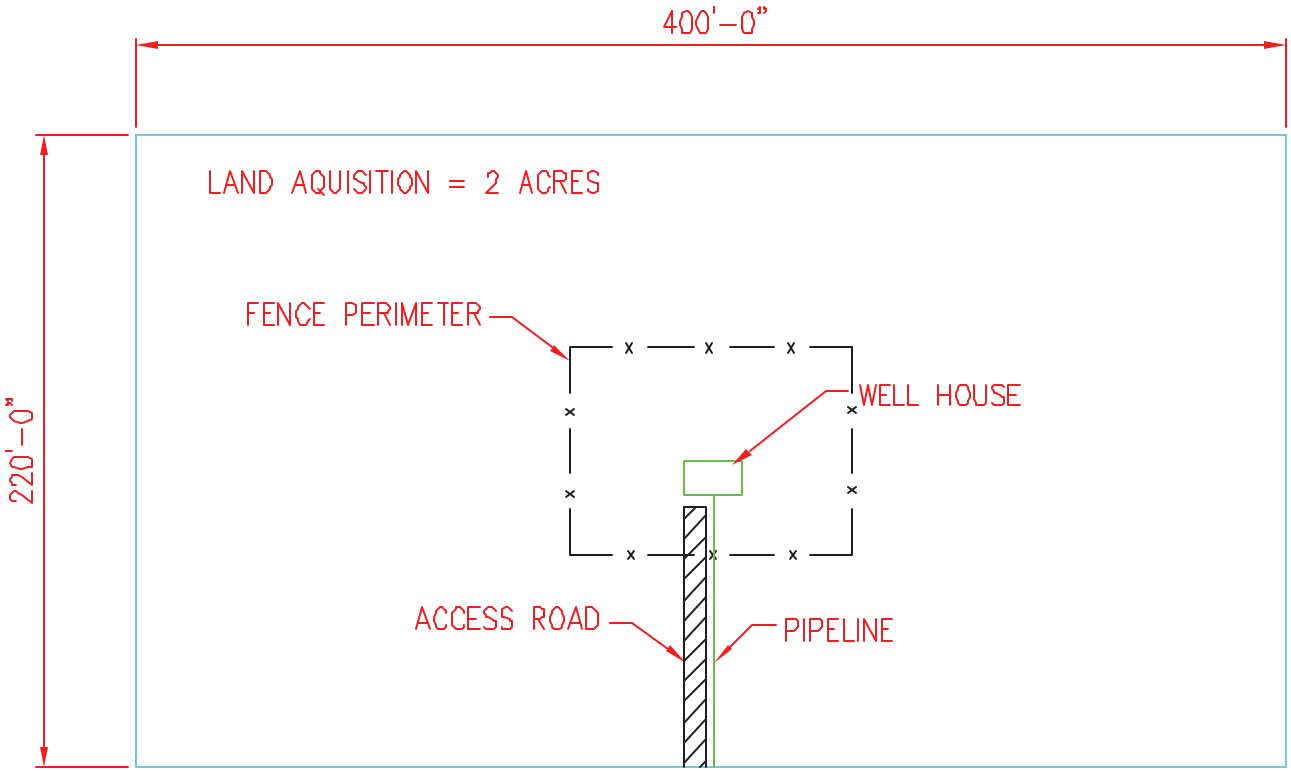
SCALE IN FEET

Burns & McDonnell

Figure 12

CONCEPTUAL PIPING PLAN FOR WEST & EAST SIDE WELL RELOCATION

J:\Hays\30159\drawings\pipeline info\conceptualpiping.dwg 06-17-2004 13:37 AAO



NOT TO SCALE

Figure 13

TYPICAL SITE PLAN SCHEMATIC

J:\Hays\30159\drawings\pipeline info\TYP_SITE_PLAN.dwg 06-16-2004 13:47 MJC

Attachment 1

Drilling Logs

Drilling Log

Project Name: City of Hays, Kansas	Boring Number: TH9-04
Project No.: 30159	Page: 1 of 1
Ground Elevation: 1,925.7 ft. msl	Location: N 4284139.38 E 470108.6014
	Total Footage: 61

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	5 in	59.5	1.5	6		16 bgs	1-13-03 (from TW9)

Drilling Company: Layne Western	Drillers (s): Rusty Bowles, Dan Henry
Drilling Rig:	Type of Penetration Test: None
Date: 1-13-03 To: 1-13-03	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No	Remarks
	Grass, topsoil	OL					NA	
	Silty sand, very fine to coarse grained, gray (10yr6/1), loose, dry, poorly graded, subangular to rounded, some fine gravel	SP-SM						1354 Set up, Getting water from City Well No. 6; added 1 50lb bag of Quik Gel; 1430 begin drilling; Hays personnel measured water level in TW9 and estimated depth to be 16 ft bgs
	Sandy clay, pale brown (10yr7/2), soft, medium plasticity	CLS						
10	Gravelly sand-sandy gravel, fine to medium grained, yellowish brown (10yr6/4), loose, well graded, subangular to rounded; limestone, chert, quartz, and siltstone grains, trace clay, fine to medium gravel	SWG						
	Sandy gravel, fine to coarse grained, yellowish brown (10yr6/4), loose, well graded, subangular to rounded, fine to coarse sand	GW						
20								1442 at 20 ft; hole taking water; added 1 bag of Quik Gel and more water
	Clay, gray (10yr6/1), soft, high plasticity	CH						
	Sandy gravel, fine to coarse grained, gray (10yr6/1), loose, well graded, subangular to rounded, fine to coarse sand; limestone, quartz, chert, and siltstone grains	GW						
30			NA	NA	NA			
	Sandy clay, gray (10yr6/1), soft, medium plasticity	CLS						
	Sandy gravel, fine to medium grained, gray (10yr6/1), loose, well graded, subangular to rounded, fine to coarse sand	GW						1505 at 35 ft
40								Hole taking water-added 1 bag of Quik Gel and more water
	Gravel and some clay	GW-CL						
50	Sandy gravel, fine to coarse grained, gray (10yr6/1), loose, well graded, subangular to rounded, fine to coarse sand	GW						1526 at 50 ft; hole taking water
								1545 at 61 ft; stop drilling; tripped out of hole and abandoned with cuttings and 3 50 lb bags of medium Hole Plug; sampled from 30-60 ft at 5 ft intervals for grain size analyses
60	Weathered shale, dark gray (10y4/1), hard	SH						
70								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/3/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas	Boring Number: TH10-04
Project No.: 30159	Page: 1 of 1
Ground Elevation: 1,924.7 ft. msl	Location: N 4284484.166 E 470225.825
Total Footage: 63	

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	5 in	61.5	1.5	6		Not Measured	

Drilling Company: Layne Western	Drillers (s): Rusty Bowles, Dan Henry
Drilling Rig:	Type of Penetration Test: None
Date: 1-13-04 To: 1-14-04	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
	Grass, topsoil	OL					NA	
	Silty sand, fine to coarse grained, gray (10yr6/1), loose, poorly graded, some fine gravel	SP-SM						1630 Set up; using water from City Well No. 6 as drillig fluid; added 1 50 lb bag of Quik Gel
	Gravelly sand, fine to coarse grained, pale brown (10yr7/2), loose, poorly graded, subangular to rounded	SPG						
10	Silt clay, pale brown (10yr6/3), soft, medium plasticity	CL						
	Sand, very fine to fine grained, yellowish brown (10yr6/4), loose, poorly graded, subangular to rounded, trace clay	SP						
20								1707 at 20; stop for today 1-14-03 730 - thawing out equipment and getting water; 900 resume drilling at 20 ft
	Sandy gravel, fine to coarse grained, yellowish brown (10yr6/4), loose, well graded, subangular to rounded; limestone, chert, quartz, and siltstone grains	GW						
30			NA	NA	NA			
	Sandy gravel, fine to medium grained, gray (10yr6/1), loose, well graded, subangular to rounded, medium to coarse sand, occasional coarse gravel and cobbles; finer gravel beginning at 48 ft	GW						910 at 35 ft; hole taking water- added 1 bag of Quik Gel and more water
40								
50								920 at 50 ft
								939 at 63 ft; stop drilling; tripped out and abandoned hole with cuttings and 3 50 lb bags of medium Hole Plug; sampled from 30-60 ft at 5 ft intervals for grain size analyses
60								
	Weathered shale, greenish gray (5y4/1), weak	SH						
70								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/3/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas	Boring Number: MSTH1-04 OW
Project No: 30159	Page: 1 of 2
Ground Elevation: 1,893.0 ft. msl	Location: N 4284456.461 E 475659.9324
	Total Footage: 56

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	5 in	54	2	6	NA	12.12 BTOC	1-15-03

Drilling Company: Layne Western	Drillers (s): Rusty Bowles, Dan Henry
Drilling Rig: D-5	Type of Penetration Test: None
Date: 1-14-03 To: 1-14-03	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov		Sample or Box No.	Remarks
	Grass	OL					NA	
	Sandy silt, very fine to fine grained, gray (10yr6/1), loose, some gravel	MLS						1225 Set up; added 1 50 lb bag of Quik Gel to drilling water. Water is from City Well No. 6
	Gravelly sand, fine to coarse grained, yellowish brown (10yr6/4), loose, poorly graded, subangular to rounded, trace clay	SPG						1241 begin
10	Sandy gravel, fine to medium grained, yellowish brown (10yr6/4), loose, well graded, subangular to rounded, limestone, chert, quartz, and siltstone grains	GW						
	Clay, gray (10yr6/1), soft, high plasticity	CL						
	Gravel and clay	GC						
20	Sandy gravel, fine to medium grained, gray (10yr6/1), loose, well graded, subangular-rounded, trace coarse	GW						1254 at 20 ft
			NA	NA	No Sample			
30	Clay, gray (10yr6/1), soft, high plasticity	CL						
	Sandy gravel with occasional cobbles	GW						Hole taking water-added 1 50 lb bag of Quik Gel and more water
								1310 at 35 ft; 1328 Hole taking water-stop to refill water tank
40								1427 Water truck returns - added Quik Gel and water and resumed drilling
	Clay, gray (10yr6/1), soft, high plasticity	CL						
	Sandy gravel, fine to medium grained, gray (10yr6/1), loose, well graded, subangular to rounded, trace coarse and cobbles, quartz, chert, limestone, and siltstone grains	GW						
50								1438 at 50 ft
	Weathered shale, gay (10yr6/1), soft, harder at 56 feet	SH						
								1500 at 56 ft; circulate at 56 ft and called office.
60								Set 2-in dia. PVC monitoring well with 20 ft of 20-slot PVC screen; placed 1/8x1/4 sand pack from TD to 20 ft bgs - used 5 100 lb bags; sealed well
70								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/3/04

Burns & McDonnell

Drilling Log, continued

Boring Number	MSTH1-04 OW
Project Name	City of Hays, Kansas
Page	2 of 2
Project Number	30159
Date	1-14-03

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
								from 20 ft to surface with 2 50 lb bags of medium Hole Plug Well TD = 54.30 ft btoc; Stick up is 2.80 ft; capped well with J-plug. Developed well 1-14 and 1-15 with 3 gpm submersible pump approx. 3 hours total.
80								
								Collected samples from 25-55 at five ft intervals for grain size analyses
90								
100								
110								
120								
130								
140								
150								
155								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/3/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas			Boring Number: MSTH2-04
Project No.: 30159			Page: 1 of 1
Ground Elevation: 1,890.0 ft. msl	Location: N 4284438.27 E 475560.85		Total Footage: 52

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	5 in	51	1	6	NA	Not Measured	

Drilling Company: Layne Western	Drillers (s): Rusty Bowles, Dan Henry
Drilling Rig: D-5	Type of Penetration Test: None
Date: 1-14-03 To: 1-15-03	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov		Sample or Box No	Remarks
	Grass, sandy silt	OL					NA	
	Silty clay, brown (10yr6/3), medium stiff, medium plasticity	CL						1615 Set up; 1639 begin; added 1 50 lb bag of Quik Gel to drilling water. Water is from City Well No. 6.
	Gravelly sand, fine to coarse grained, yellowish brown (10yr6/4), loose, well graded, subangular to rounded, fine to medium gravel; quartz, limestone, chert, and siltstone grains	SWG						
10								
20								1647 Hole taking water - water tank is empty so stop for today
	Sandy gravel, fine to medium grained, gray (10yr6/1), loose, well graded, subangular to rounded, fine to coarse grained sand, occasional cobbles	GW	NA	NA	No Sample			1-15-03 800 - Thawing out equipment; 900 Resume drilling at 20 ft.
30								920 at 35 ft; hole taking water - added more Quik Gel and water
40	Gravelly sand, fine to coarse grained, gray (10yr6/1), loose, well graded, subangular to rounded, fine gravel, occasional cobbles	SWG						
50								934 at 50 ft
	Weathered shale, gray (10yr6/1), soft	SH						948 at 52 ft; trip out and abandoned hole with 3 50 lb bags of Hole Plug; sampled from 25-50 ft bgs at 5 ft intervals for grain size analyses: 1040 left site
60								
70								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/3/04

Burns & McDonnell

Drilling Log

Project Name	Boring Number
City of Hays, Kansas	GP1-2
Project No. 30159	Page 1 of 1
Ground Elevation 1,904.0 ft. msl; Location N 14058299.54 E 1555644.731	Total Footage 64.249

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Geoprobe	1.5 in			14		~13 ft	Estimated

Drilling Company: Plains Environmental	Drillers (s): Jesse Talvig, Jason Auernheimer
Drilling Rig:	Type of Penetration Test: none
Date: 4-7-04 To: 4-7-04	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
	Silty sand, very fine to medium grained, grayish brown (10yr5/2), loose, dry, poorly gradedd, trace clay	SM			4/4			
	Sand, fine grained, light brown (10yr7/3), loose, dry, poorly graded, subangular to rounded, trace clay	SP			3/4			1244
10	Gravelly sand, fine to coarse grained, yellowish brown (10yr6/4), moist loose, poorly graded, subangular to rounded, fine gravel, wet at ~13 ft.	SPG			3/4			1250
					2/4			1252
					2/4			1257
20	Gravelly sand, medium to coarse grained, light brown (10yr6/4), loose, wet, well graded, subangular to rounded, fine gravel, trace coarse, wet	SPG			1.5/4			1305
	Clay, gray (10yr5/1), soft, med. plasticity, silty	CL			4/4			1317
30	Gravelly sand, medium to coarse grained, gray (10yr5/1), loose, wet, poorly graded, fine to coarse gravel, large rock fragments 25.5 to 27 ft, then gravelly sand with occasional large rock fragments (siltstone and limestone)	SPG			3/4			1330
					1/4			1338
	Clayey sand, fine grained, gray (10yr5/1), slight plasticity, soft, poorly graded	SC			3/4			1350
40	Sandy gravel, fine to medium grained, brown (10yr5/3), loose, wet, well graded, subangular to rounded, medium to coarse sand, trace clay	G						
	Gravelly sand, fine to coarse grained, gray (10yr5/1), loose, wet, well graded, fine gravel	SPG			2/4			1407
	Sandy gravel, fine to medium grained, gray (10yr5/1), loose, wet, well graded, subangular to rounded, medium to coarse sand, trace coarse rock fragments	G			2/4			1423
50					3/4			1450
					2/4			1505
	Shale, gray (10yr 4/1), hard	SH						1525
60								
70								

DRILLING LOG HAYSLOGS.GPJ BURNS MO.GDT 4/30/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas			Boring Number: GP2-1
Project No.: 30159			Page: 1 of 1
Ground Elevation: 1,900.0 ft. msl	Location: N 14058267.22 E 1556951.59		Total Footage: 55.749

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Geoprobe	1.5 in	55.75	-9.9999999999997669E-04	3		~13 ft	Estimated

Drilling Company	Plains Environmental	Drillers (s)	Jesse Talvig, Jason Auernheimer
Drilling Rig		Type of Penetration Test	none
Date 4-7-04	To 4-7-04	Field Observer (s)	R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
10								
20					No Sample			
30					No Sample			
	Sand, fine to medium grained, gray (10yr6/1), wet, loose, poorly graded, subangular to rounded	SP			3/4			
40	Gravelly sand, fine to coarse grained, gray (10yr6/1), wet, loose, poorly graded, subangular to rounded, fine gravel	SPG			4/4			1700
	Silt, gray (10yr5/1), sl. platicity, medium stiff	ML			No Sample			17:15
50	Gravelly sand, fine to coarse grained, gray (10yr6/1), wet, loose, poorly graded, subangular to rounded, fine gravel	SPG			4/4			1735
60								1745 stop back fill hole with bentonite. 1600 left site
70								

DRILLING LOG HAYSLOGS.GPJ BURNS MO.GDT 4/30/04

Burns & McDonnell

Drilling Log

Project Name	Boring Number
City of Hays, Kansas	GP4-4
Project No. 30159	Page 1 of 1
Ground Elevation 1,900.0 ft. msl	Location N 14057773.7 E 1560394.817
Total Footage 58.899	

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Geoprobe	1.5 in					~15 ft	Estimated

Drilling Company Plains Environmental	Drillers (s) Jesse Talvig, Jason Auernheimer
Drilling Rig	Type of Penetration Test
Date 4-7-04 To 4-7-04	Field Observer (s) R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
							NA	
10					No Sample			
20								
	Gravelly sand, fine to coarse grained, light brown (10yr6/2), wet loose, trace green clay, poorly graded, subangular to rounded, fine gravel	SP-SPG			2/4			1030
30					No Sample			
40								
	Gravelly sand, fine to coarse grained, light brown (10yr6/2), loose, wet, well graded, fine to medium gravel, trace coarse, subangular to rounded	SPG			3/4			1045
50								
60								
70								

DRILLING LOG HAYSLOGS.GPJ BURNS MO.GDT 4/30/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas						Boring Number: TB 4-04 7	
Project No.: 30159						Page: 1 of 1	
Ground Elevation: 1,902.0 ft. msl		Location: N 14058988.279 E 1559898.076				Total Footage: 60	
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	6"	60	0	1	NA	Not Measured	
Drilling Company: Karst Water Well				Drillers (s): Richard Froelic, Bill Skeen, Terry Freed			
Drilling Rig				Type of Penetration Test: None			
Date: 5-12-04		To: 5-12-04		Field Observer (s): R. Jaques			

Depth	Description	Class	Blow Count	Field Strength	Recov		Sample or Box No	Remarks
	Sandy silt, ligth brownish gray, soft, dry, non-plastic, some fine sand and gravel	ML					NA	14:17 setup; 14:23 begin
10	Silty clay, brown, medium stiff, medium plasticity, some sand	CL						14:37 at 15 ft
20	Sandy gravel, fine to coarse grained, light brown, well graded, subangular to subrounded, abundanr rust colored chert, sand is medium to very coarse	G						
30	Gravelly sand, medium to very coarse grained, gray, well graded, fine grave, trace clay	SPG	NA	NA	NA			14:40 at 30 ft
40								14:48 at 45 ft; Hole is taking water; 14:59 Bit plugged up, tripped out 1506 circulate and resume drilling
50	Gravelly sand, fine to coarse grained, gray, well graded, occassional fine gravel.	SP-SPG						1519 at 60 ft; hole is taking alot of water - approximately 2000 gallons since beginning drilling; driller does not have drilling mud so will stop drilling here.
60								
70								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/4/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas	Boring Number: OW 2-04 1
Project No.: 30159	Page: 1 of 1
Ground Elevation: msl; Location: 20 feet north of Test Well	Total Footage: 51

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	6 in	51	0	0	NA	14.45 ft btoc	5-12-04

Drilling Company: Karst Water Well	Drillers (s): Richard Froelic, Bill Skeen, Terry Freed
Drilling Rig: Truck Mounted	Type of Penetration Test: None
Date: 5-12-04 To: 5-12-04	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
	Gravelly sand, cerdium to very coarse grained, light brown, well graded, subangular to round, fine gravel, trace medium, abundant rust colored chert	SPG					NA	930 setup; 9:35 begin drilling
10	Sand, medium to very coarse grained, gray, poorly graded, subangular to rounded, trace clay at 29 feet	SP/SC						
20			NA	NA	NA			
30	Sand, fine to medium grained, gray, poorly graded	SP						944 at 30 feet
40	Sand, medium to very coarse grained, gray , well graded, subangular to rounded	SP						954 at 45 ft; hole is taking water
	Gravelly sand, medium to very coarse grained, gray, well graded, subangular to rounded, fine gravel, trace coarse	SPG W						10:00 Stop drilling at 51 ft bgs; circulate; 1005 trip out; 1011 set well
50	Shale, dark gray, weathered, soft, slightly fissle	SH						1011 set 2 inch dia. PVC observation well - 20 ft 20-slot screen with centralizers at 50 and 30 feet. Gravel pack is coarse gravelly sand to 15 ft bgs; sealed hole with 6 50 lb. bags of medium bentonite chips to surface. Final well TD is 50 ft btoc
60								
70								

DRILLING LOG HAYSLOGS.GPJ BURNS_MO.GDT 6/4/04

Burns & McDonnell

Drilling Log

Project Name: City of Hays, Kansas	Boring Number: OW 2-04 2
Project No.: 30159	Page: 1 of 1
Ground Elevation: msl; Location: 40 feet west of Test Well	Total Footage: 54

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Mud Rotary	6 in	53	1	0	NA		

Drilling Company: Karst Water Well	Drillers (s): Richard Froelic, Bill Skeen, Terry Freed
Drilling Rig: Truck Mounted	Type of Penetration Test: None
Date: 5-12-04; To: 5-12-04	Field Observer (s): R. Jaques

Depth	Description	Class	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
	Silty, clayey, sand, very fine to medium grained, light brown, poorly graded	SC SM					NA	1047 setup; 1056 begin drilling
	Gravelly sand, medium to very coarse grained, light brown, well graded, subangular to rounded, fine gravel, trace medium, abundant rust colored chert	SPG						
10								
	Sand, medium to coarse grained, gray, poorly graded, subangular to rounded	SP						1059 at 15 ft
20								Hole taking water
	Gravelly sand, medium to very coarse, gray, well graded, subangular to rounded, fine gravel with trace medium	SPG	NA	NA	NA			
30	Clay and silt gray, soft, low to medium plasticity	CL ML						1107 at 30 ft
	Gravelly sand, medium to very coarse, gray, well graded, subangular to rounded, fine gravel with trace medium	SPG						
40								Hole taking water
	same as above with finer sand and some medium gravel	SPG						
50	Sand, medium to very coarse grained, gray, poorly graded, occassional cobbles of siltstone and limestone	SPG						1128 circulate at 54 ft; 1133 trip out to set well; used 20 ft of 20-slot PVC 2-in dia. screen and 30 feet of 2-in diameter PVC riser; gravel pack is well graded sandy gravel to 15 ft bgs; medium bentonite chips to surface. Stablizers at 50 and 30 feet.
	Shale, weathered, dark gray, soft	SH						
60								
70								

DRILLING LOG HAYSLOGS GPJ BURNS_MO.GDT 6/4/04

Burns & McDonnell

Attachment 2

Grain Size Analyses

January 23, 2004

GEOTECH

GEOTECHNICAL SERVICES: DESIGN • CONSTRUCTION • FORENSIC

Mr. Pat Higgins
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Fax # (816) 822-3414

HAYS, (A-OG Project #04-129T)

Dear Mr. Higgins:

We have completed our laboratory testing services for your above-referenced project.

The detailed results of these tests are enclosed. As you directed, these testing services were provided in accordance with test methods that you specified.

If you have any questions regarding this information or require any further testing, please contact me at your convenience. We enjoy doing business with you.

Sincerely,
ALPHA-OMEGA GEOTECH, INC.

Thomas J. Burdick

Thomas J. Burdick
Laboratory Manager

Enclosures

Alpha-Omega Geotech, Inc.
1701 State Avenue
Kansas City, Kansas 66102
(913) 371-0000
FAX (913) 371-6710

SUMMARY OF LABORATORY TESTING

PROJECT NAME: HAYS
PROJECT LOCATION:

PROJECT NUMBER: 4-129T
DATE: 1/22/2004

GEOTECH

Boring Number	Sample Number	Depth or Elevation	Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	USCS Class.	% Passing No. 200	Unconfined Compression PSF	%c	% Swell	Remarks
9-04	1	35'-40'	Well-graded sand with silt and gravel						SW-SM	5.9				
9-04	2	45'-50'	Silty sand with gravel						SM	13.6				
9-04	3	55'-60'	Poorly graded sand with gravel						SP	2.6				
10-04	1	35'-40'	Well graded sand with gravel						SW	2.4				
10-04	2	45'-50'	Poorly graded sand with gravel						SP	2.4				
10-04	3	55'-60'	Poorly graded sand with silt						SP-SM	5.9				
MSTH1-04	1	25'-30'	Poorly graded sand						SP	2.8				
MSTH1-04	2	35'-40'	Poorly graded sand						SP	2.9				
MSTH1-04	3	45'-50'	Poorly graded sand						SP	2.9				
MSTH2-04	1	25'-30'	Poorly graded sand						SP	3.0				

Alpha-Omega Geotech, Inc.

SUMMARY OF LABORATORY TESTING

PROJECT NAME: HAYS
PROJECT LOCATION:

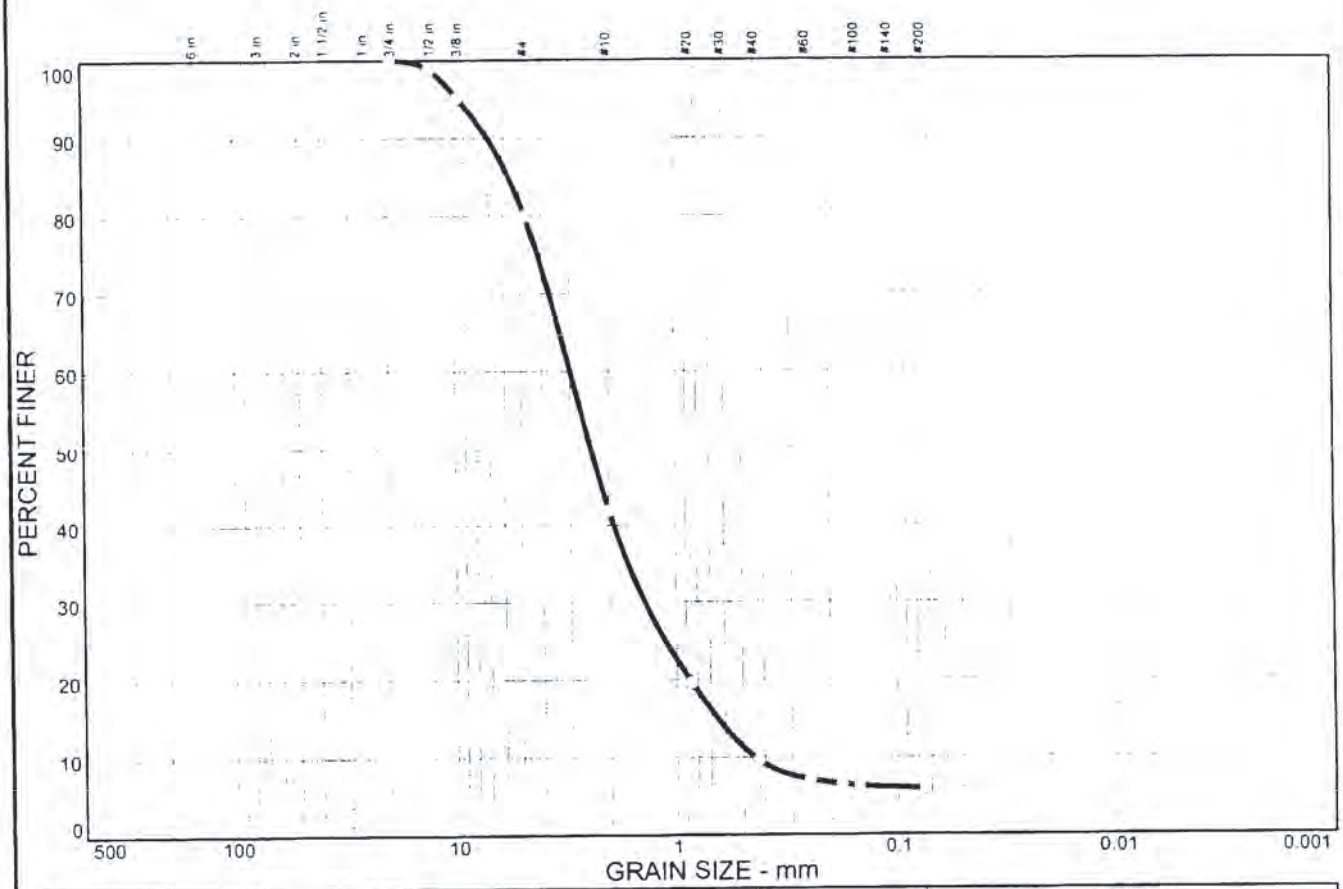
PROJECT NUMBER: 4-129T
DATE: 1/22/2004

GEOTECH

Boring Number	Sample Number	Depth or Elevation	Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	USCS Class.	% Passing No. 200	Unconfined Compression PSF	%ε	% Swell	Remarks
MSTH2-04	2	35'-40'	Well-graded sand with silt and gravel						SW-SM	5.9				
MSTH2-04	3	45'-50'	Poorly graded sand						SP	2.0				

Alpha-Omega Geotech, Inc.

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	20.1	38.0	32.3	3.7	5.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.8		
.375 in.	95.2		
#4	79.9		
#10	41.9		
#20	19.6		
#40	9.6		
#60	7.1		
#80	6.5		
#100	6.3		
#200	5.9		

* (no specification provided)

Soil Description

Well-graded sand with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 5.61 D_{60}= 2.99 D_{50}= 2.42
D_{30}= 1.38 D_{15}= 0.651 D_{10}= 0.444
C_u= 6.75 C_c= 1.44

Classification

USCS= SW-SM AASHTO=

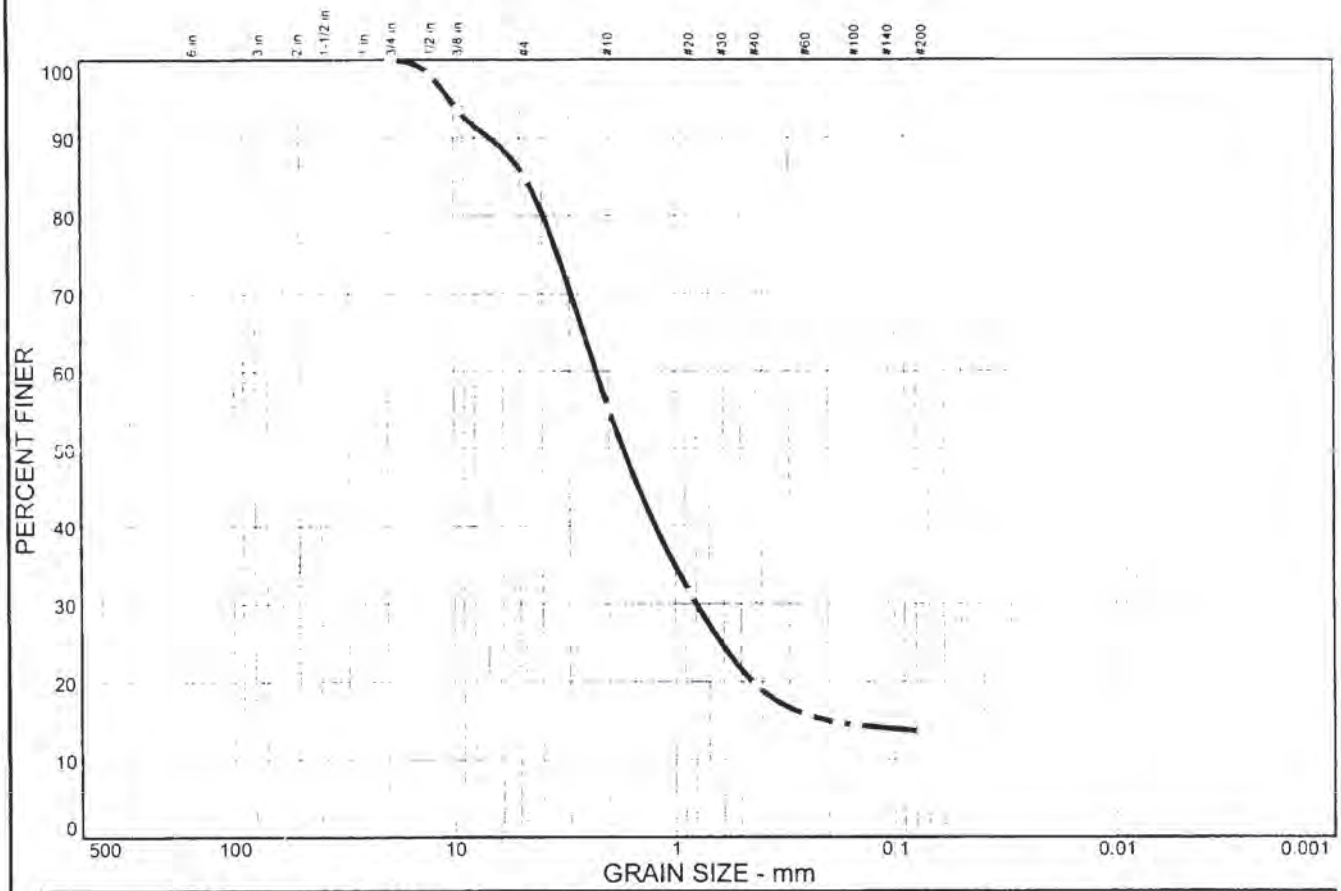
Remarks

Sample No.: 1 **Source of Sample:** **Date:** 1/22/04
Location: 9-04 **Elev./Depth:** 35'-40'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	15.1	29.8	35.6	5.9	13.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.1		
.375 in.	93.6		
#4	84.9		
#10	55.1		
#20	31.3		
#40	19.5		
#60	15.7		
#80	14.7		
#100	14.4		
#200	13.6		

* (no specification provided)

Soil Description

Silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.77 D_{60}= 2.28 D_{50}= 1.72
D_{30}= 0.800 D_{15}= 0.204 D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO=

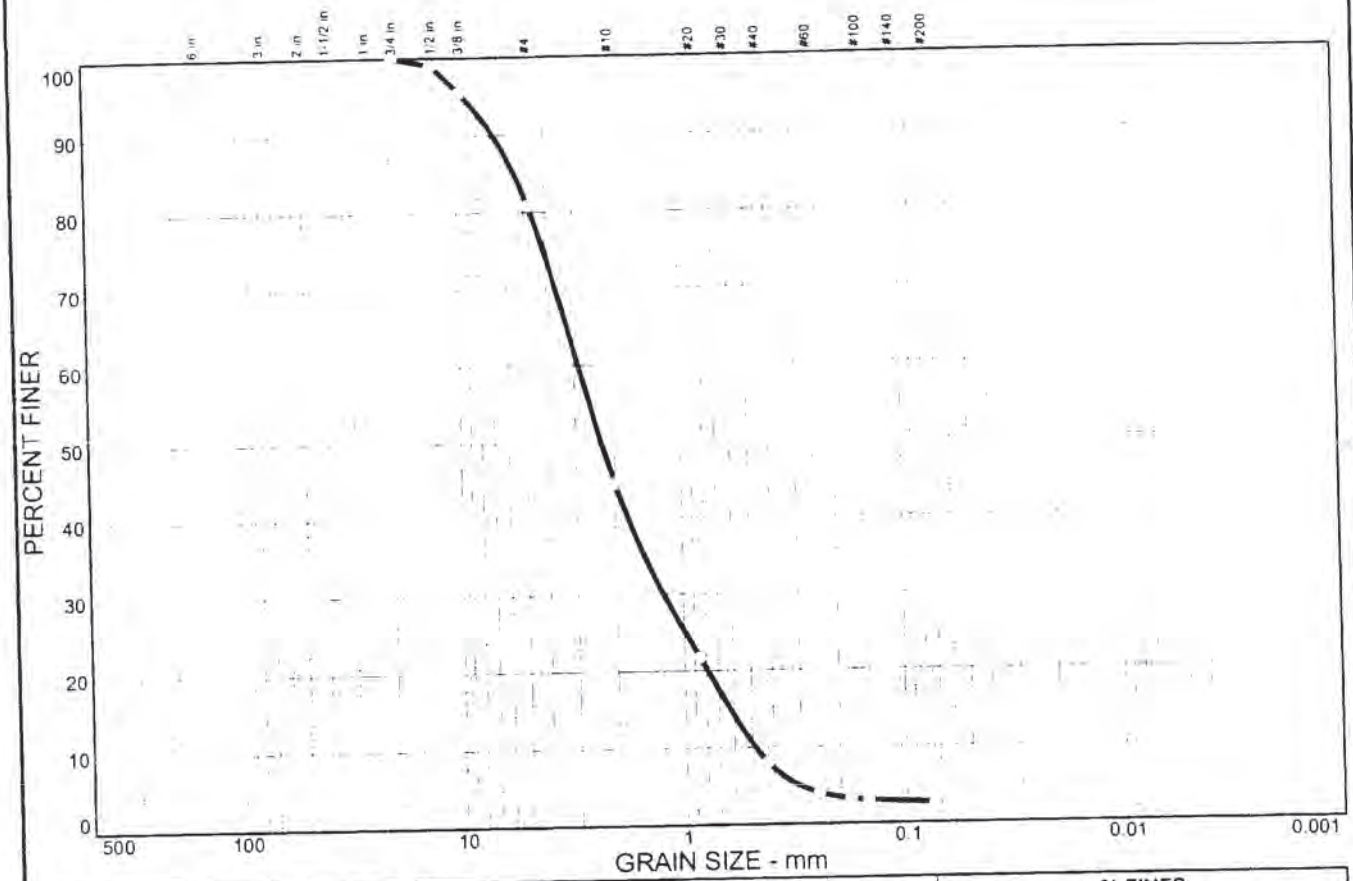
Remarks

Sample No.: 2 **Source of Sample:** **Date:** 1/22/04
Location: 9-04 **Elev./Depth:** 45'-50'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	19.2	36.3	36.5	5.4	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.1		
.375 in.	95.5		
#4	80.8		
#10	44.5		
#20	21.7		
#40	8.0		
#60	4.0		
#80	3.2		
#100	3.0		
#200	2.6		

* (no specification provided)

Soil Description

Poorly graded sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 5.46 D_{60}= 2.88 D_{50}= 2.30
D_{30}= 1.23 D_{15}= 0.628 D_{10}= 0.485
C_u= 5.94 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

Sample No.: 3
Location: 9-04

Source of Sample:

Date: 1/22/04
Elev./Depth: 55'-60'

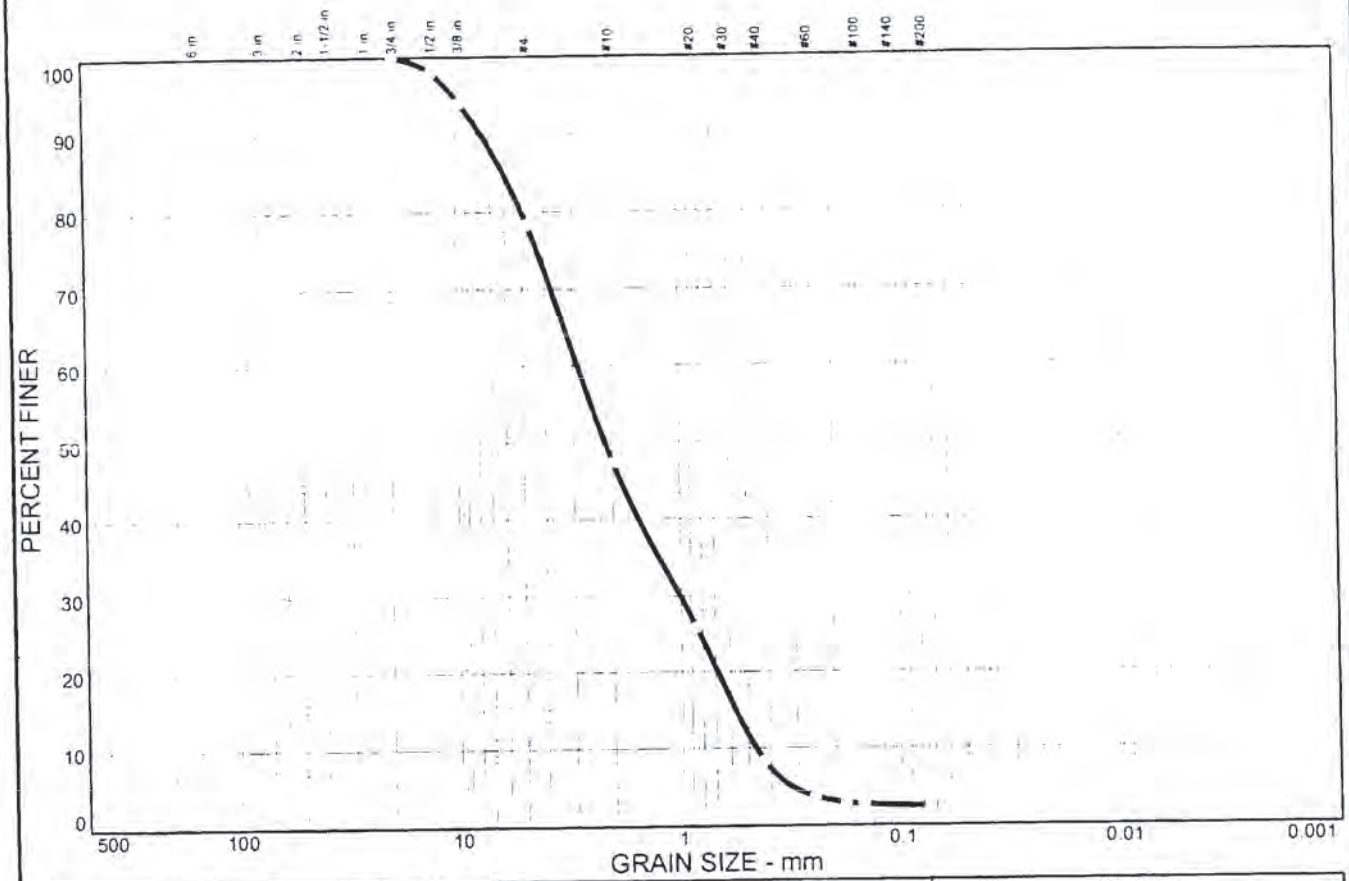
Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS

Project No: 4-129T

Figure 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	21.7	31.0	39.0	5.9	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.0		
.375 in.	94.1		
#4	78.3		
#10	47.3		
#20	25.8		
#40	8.3		
#60	3.7		
#80	2.9		
#100	2.7		
#200	2.4		

* (no specification provided)

Soil Description

Well graded sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.04 D_{60}= 2.86 D_{50}= 2.17
D_{30}= 1.01 D_{15}= 0.573 D_{10}= 0.465
C_u= 6.16 C_c= 0.76

Classification

USCS= SW AASHTO=

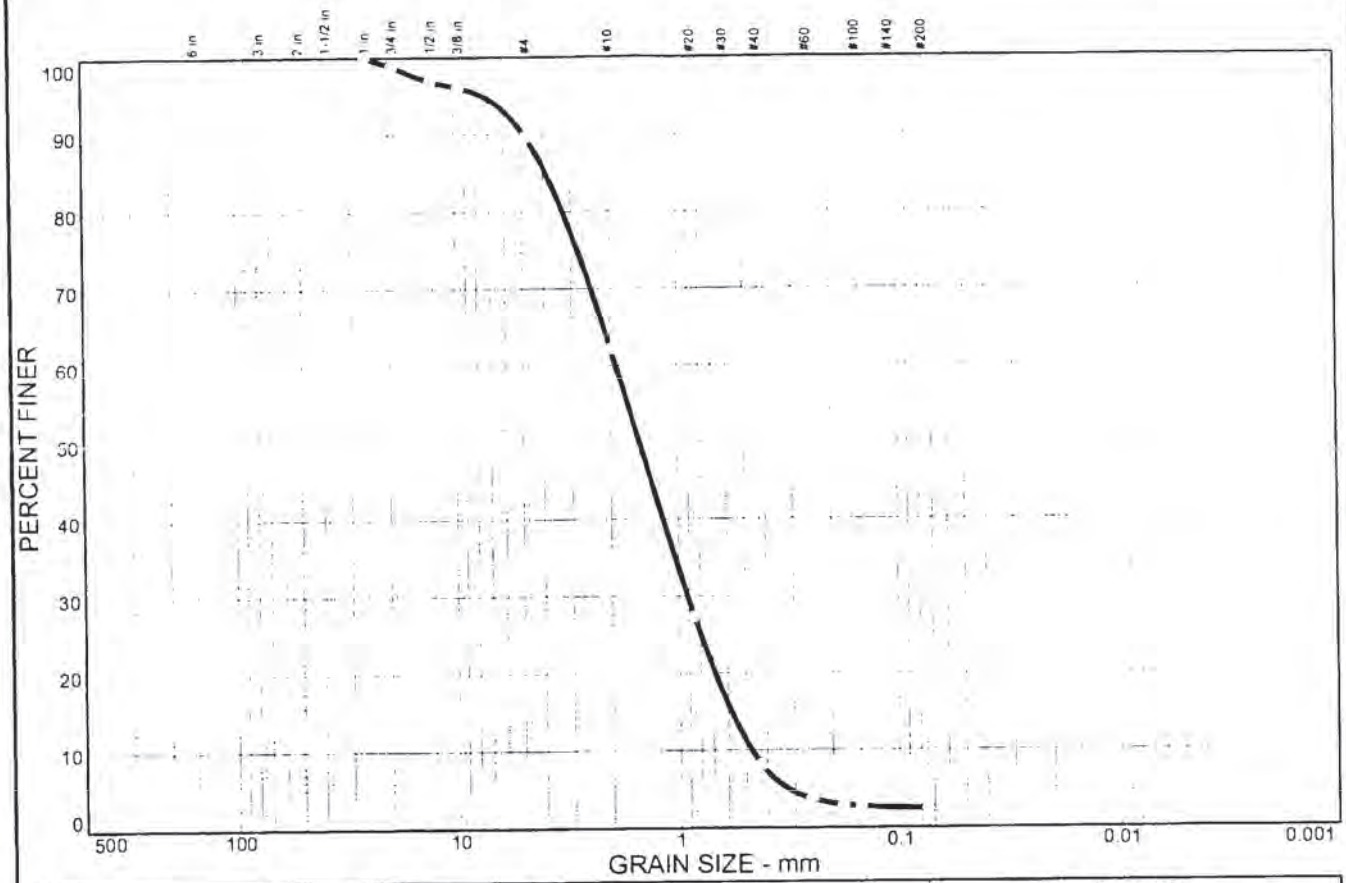
Remarks

Sample No.: 1 **Source of Sample:** **Date:** 1/22/04
Location: 10-04 **Elev./Depth:** 35'-40'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	1.2	9.1	27.6	54.0	5.7	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	98.8		
.5 in.	96.9		
.375 in.	96.1		
#4	89.7		
#10	62.1		
#20	27.3		
#40	8.1		
#60	3.7		
#80	2.9		
#100	2.7		
#200	2.4		

* (no specification provided)

Soil Description

Poorly graded sand with gravel

Atterberg Limits

Pl = LL= PI=

Coefficients

D_{85}= 3.87 D_{60}= 1.90 D_{50}= 1.49
D_{30}= 0.914 D_{15}= 0.582 D_{10}= 0.472
C_u= 4.03 C_c= 0.93

Classification

USCS= SP AASHTO=

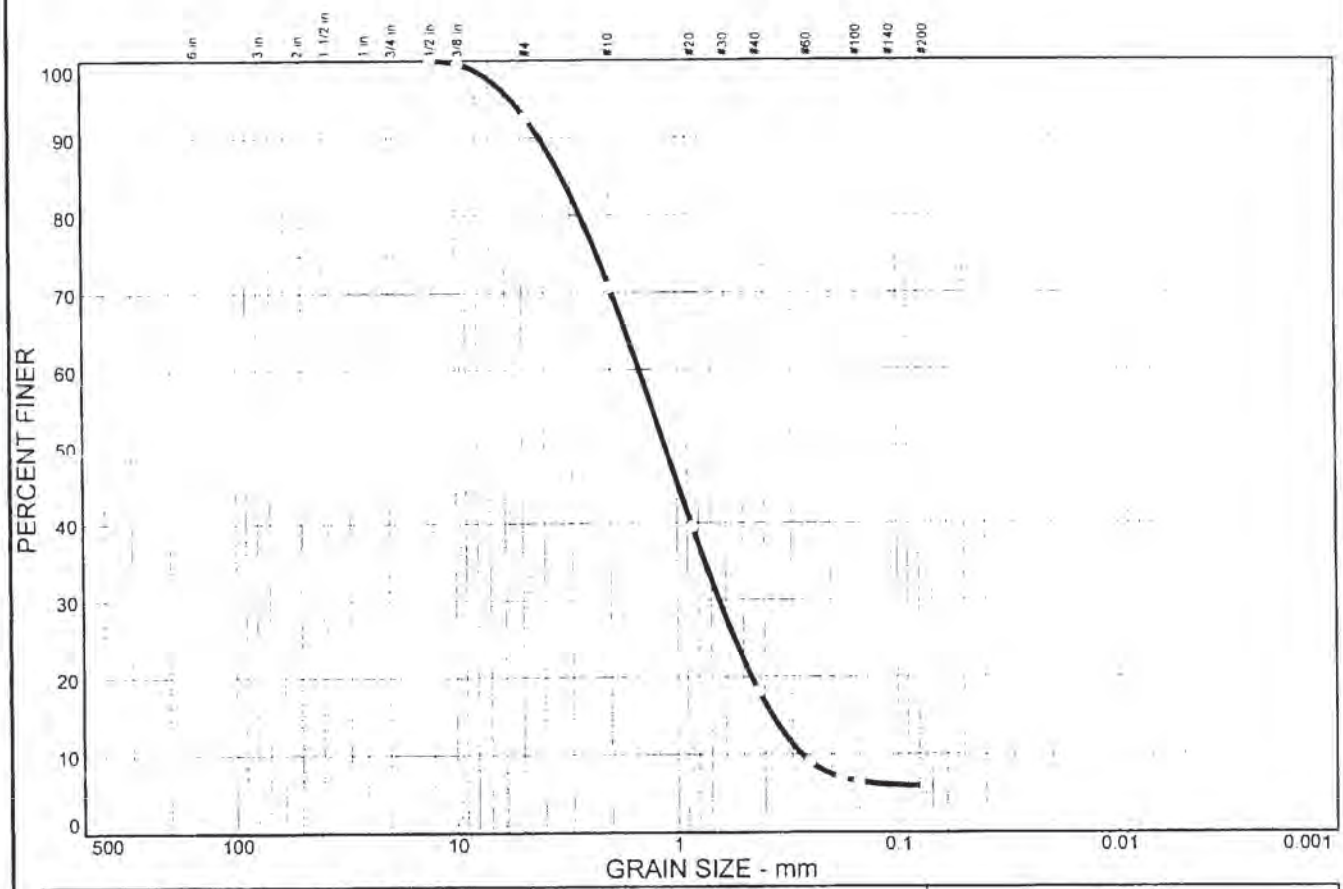
Remarks

Sample No.: 2 **Source of Sample:** **Date:** 1/22/04
Location: 10-04 **Elev./Depth:** 45'-50'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	7.4	21.9	52.6	12.2	5.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.6		
#4	92.6		
#10	70.7		
#20	39.5		
#40	18.1		
#60	9.0		
#80	7.0		
#100	6.5		
#200	5.9		

* (no specification provided)

Soil Description

Poorly graded sand with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.29 D_{60}= 1.48 D_{50}= 1.13
D_{30}= 0.645 D_{15}= 0.370 D_{10}= 0.274
C_u= 5.39 C_c= 1.03

Classification

USCS= SP-SM AASHTO=

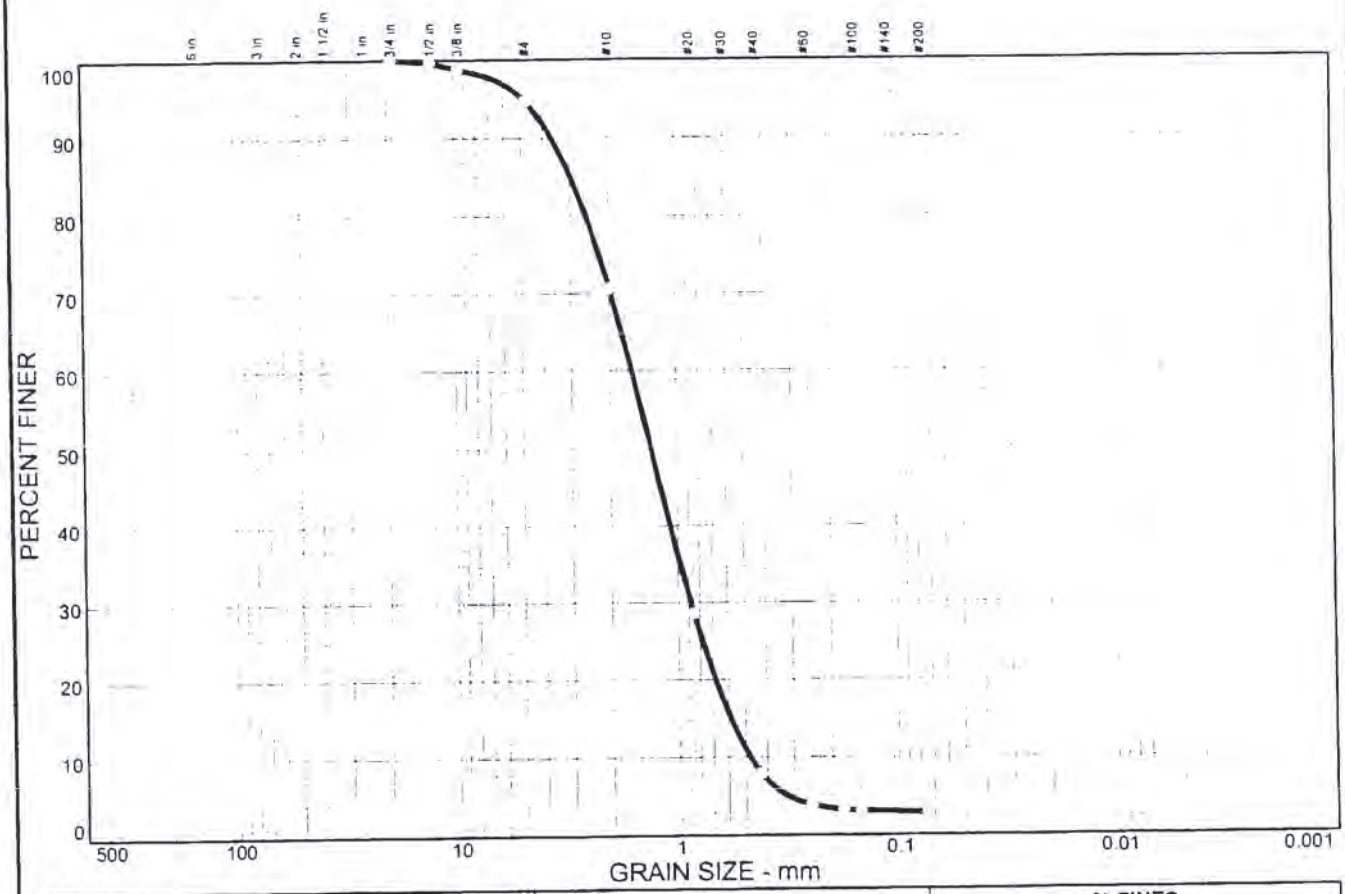
Remarks

Sample No.: 3 **Source of Sample:** **Date:** 1/19/04
Location: 10-04 **Elev./Depth:** 55'-60'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	5.3	24.1	62.7	5.1	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.7		
.375 in.	98.8		
#4	94.7		
#10	70.6		
#20	28.6		
#40	7.9		
#60	3.9		
#80	3.2		
#100	3.1		
#200	2.8		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.98 D_{60}= 1.60 D_{50}= 1.31
D_{30}= 0.877 D_{15}= 0.585 D_{10}= 0.478
C_u= 3.34 C_c= 1.01

Classification

USCS= SP AASHTO=

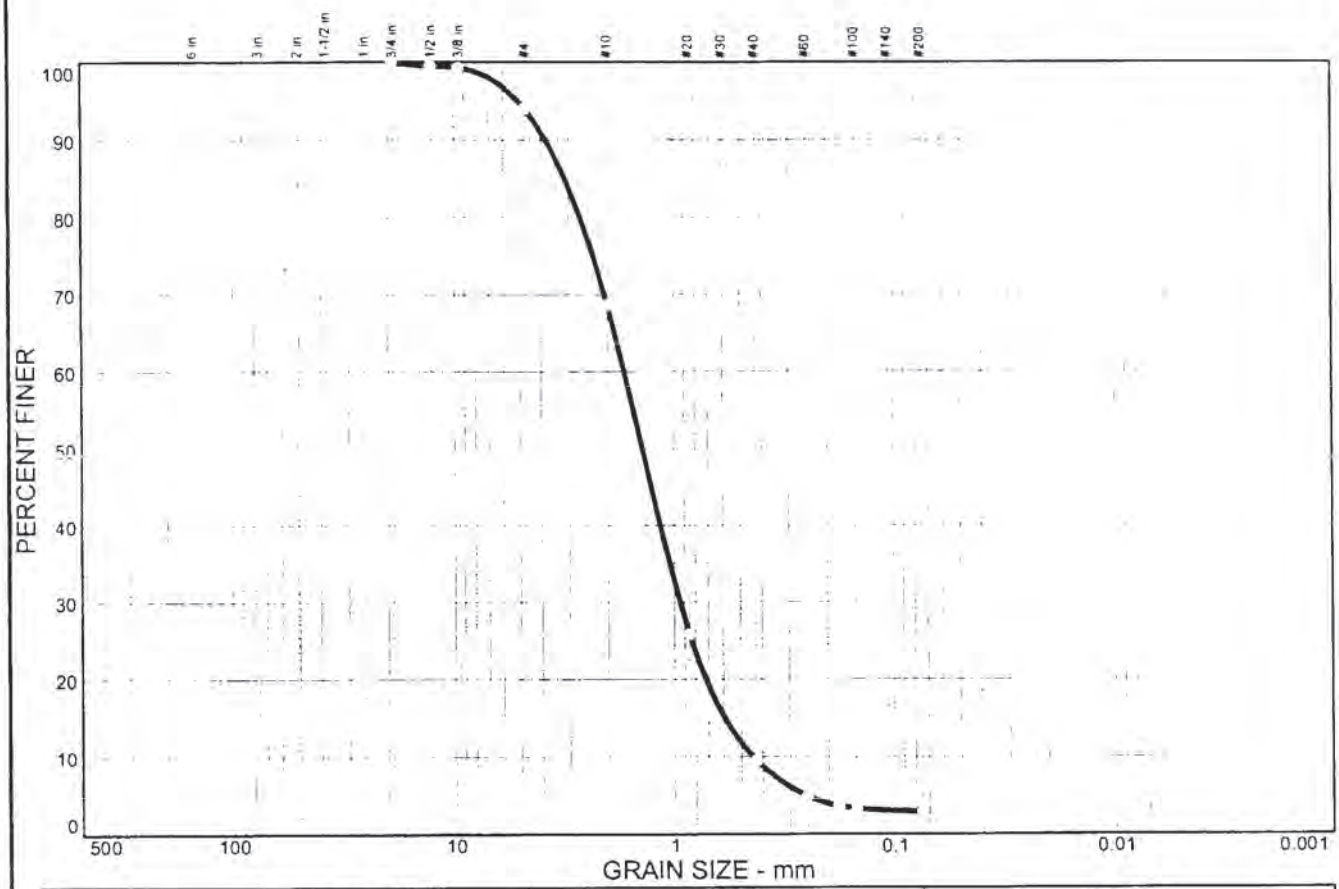
Remarks

Sample No.: 1 **Source of Sample:** **Date:** 1/22/04
Location: MSTH1-04 **Elev./Depth:** 25'-30'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	6.0	25.4	59.1	6.6	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	99.5		
.375 in.	99.3		
#4	94.0		
#10	68.6		
#20	25.8		
#40	9.5		
#60	4.9		
#80	3.6		
#100	3.3		
#200	2.9		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.12 D_{60}= 1.68 D_{50}= 1.39
D_{30}= 0.939 D_{15}= 0.592 D_{10}= 0.442
C_u= 3.80 C_c= 1.19

Classification

USCS= SP AASHTO=

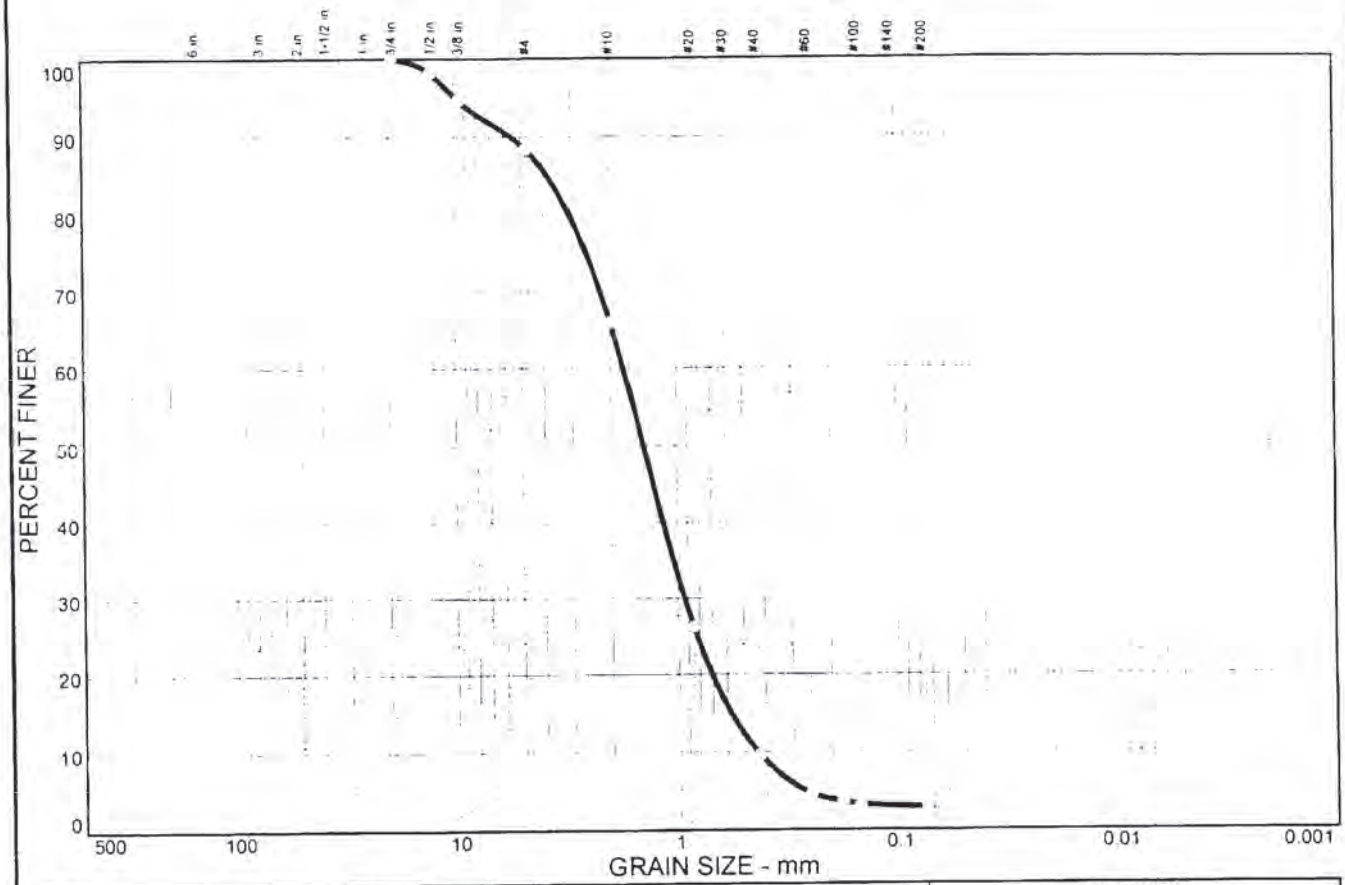
Remarks

Sample No.: 2 **Source of Sample:** **Date:** 1/22/04
Location: MSTH1-04 **Elev./Depth:** 35'-40'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	11.6	22.5	56.3	6.7	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
75 in.	100.0		
.5 in.	98.2		
375 in.	94.7		
#4	88.4		
#10	65.9		
#20	26.2		
#40	9.6		
#60	4.6		
#80	3.6		
#100	3.3		
#200	2.9		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.81 D_{60}= 1.75 D_{50}= 1.42
D_{30}= 0.935 D_{15}= 0.579 D_{10}= 0.437
C_u= 4.00 C_c= 1.14

Classification

USCS= SP AASHTO=

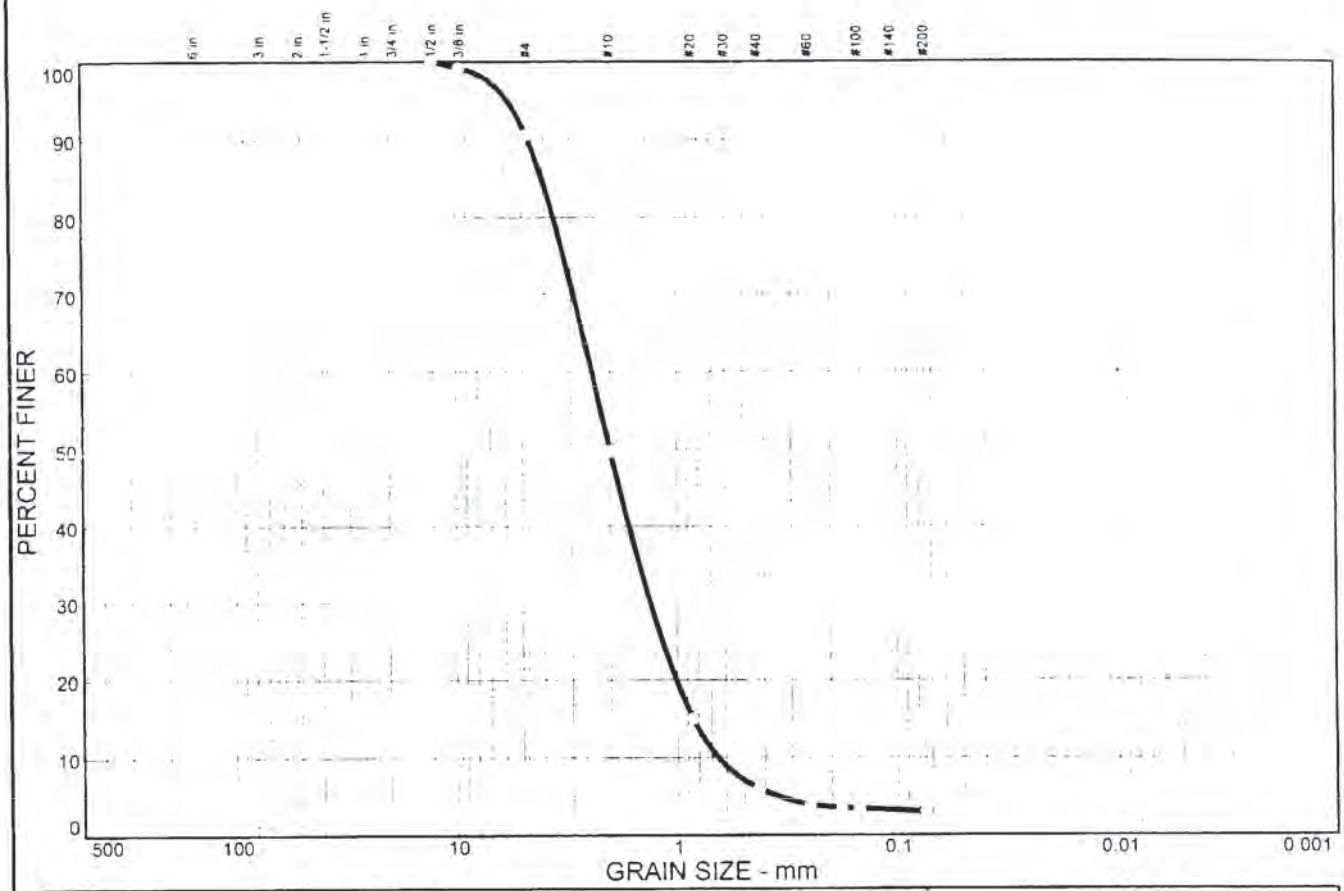
Remarks

Sample No.: 3 **Source of Sample:** **Date:** 1/22/04
Location: MSTH1-04 **Elev./Depth:** 45'-50'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	9.4	40.8	43.8	3.0	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.2		
#4	90.6		
#10	49.8		
#20	15.0		
#40	6.0		
#60	3.9		
#80	3.5		
#100	3.4		
#200	3.0		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.04 D_{60}= 2.42 D_{50}= 2.01
D_{30}= 1.32 D_{15}= 0.850 D_{10}= 0.656
C_u= 3.69 C_c= 1.10

Classification

USCS= SP AASHTO=

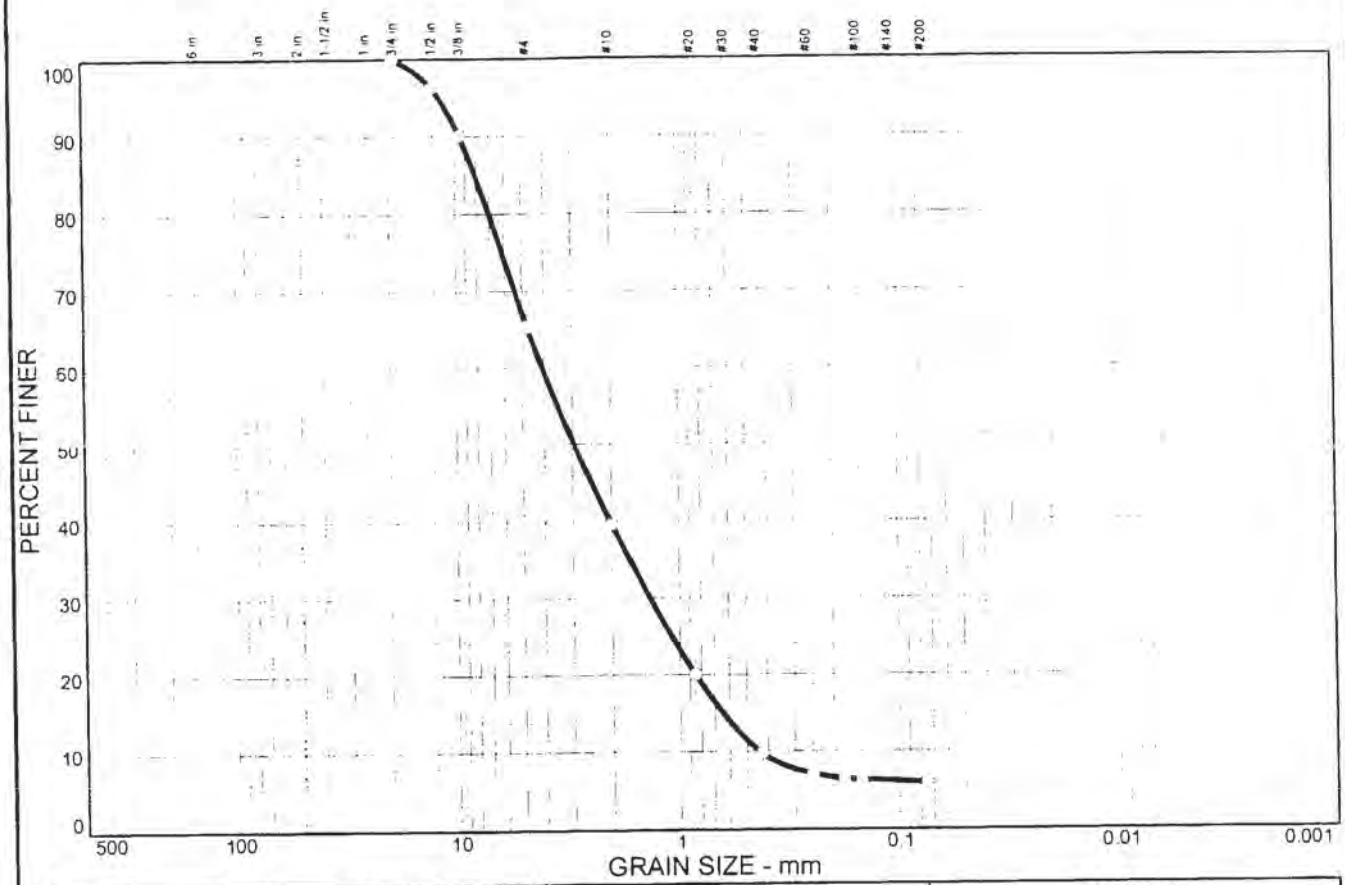
Remarks

Sample No.: 1 **Source of Sample:** **Date:** 1/19/04
Location: MSTH2-04 **Elev./Depth:** 25'-30'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	34.6	25.8	29.9	3.8	5.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	96.3		
.375 in.	90.1		
#4	65.4		
#10	39.6		
#20	20.0		
#40	9.7		
#60	7.1		
#80	6.4		
#100	6.3		
#200	5.9		

* (no specification provided)

Soil Description

Well-graded sand with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 8.08 D_{60}= 4.06 D_{50}= 2.94
D_{30}= 1.35 D_{15}= 0.644 D_{10}= 0.439
C_u= 9.25 C_c= 1.03

Classification

USCS= SW-SM AASHTO=

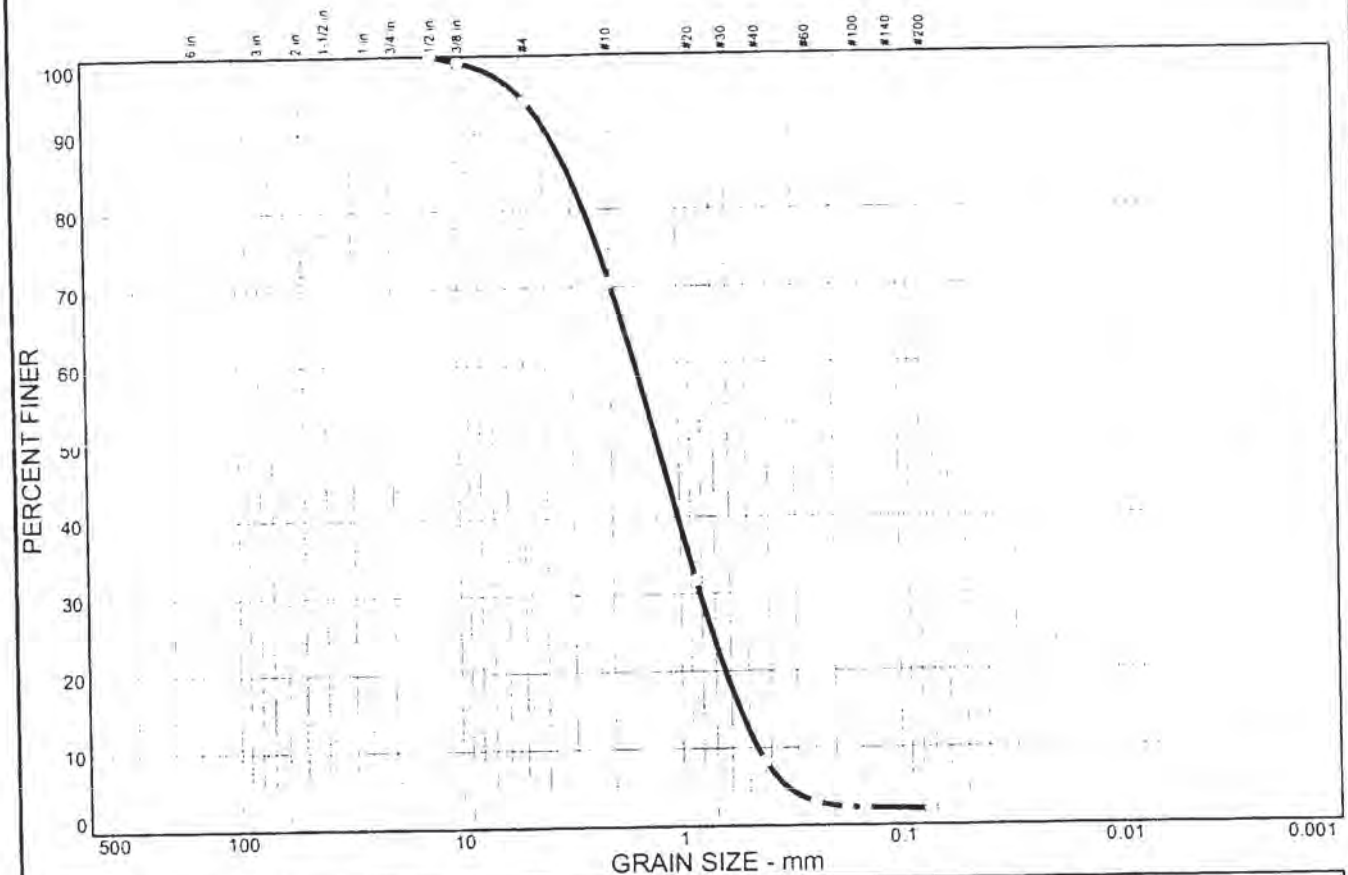
Remarks

Sample No.: 2 **Source of Sample:** **Date:** 1/22/04
Location: MSTH2-04 **Elev./Depth:** 35'-40'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	5.9	23.6	62.2	6.3	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	99.2		
#4	94.1		
#10	70.5		
#20	31.8		
#40	8.3		
#60	3.0		
#80	2.3		
#100	2.2		
#200	2.0		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.08 D_{60}= 1.56 D_{50}= 1.26
D_{30}= 0.816 D_{15}= 0.550 D_{10}= 0.459
C_u= 3.40 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

Sample No.: 3 **Source of Sample:** **Date:** 1/19/04
Location: MSTH2-04 **Elev./Depth:** 45'-50'

Alpha-Omega Geotech, Inc.

Client: Burns & McDonnell
Project: HAYS
Project No: 4-129T **Figure** 1

Attachment 3

Geoprobe Conductivity Logs

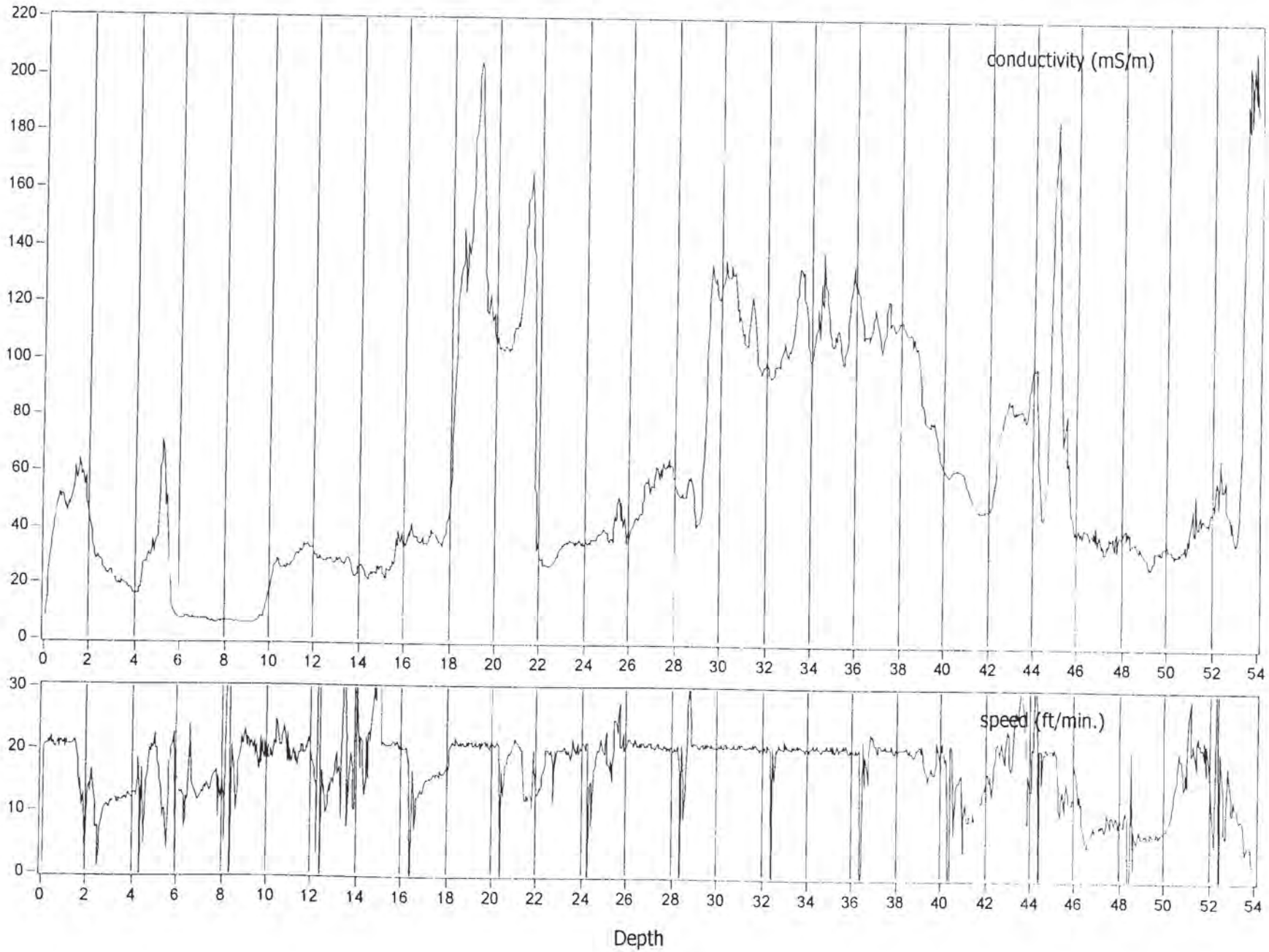
Plains Environmental Services Analysis Log Sheet

Client: Burns & MacDonald
Date: 4/5/04
Location: Hays, Ks

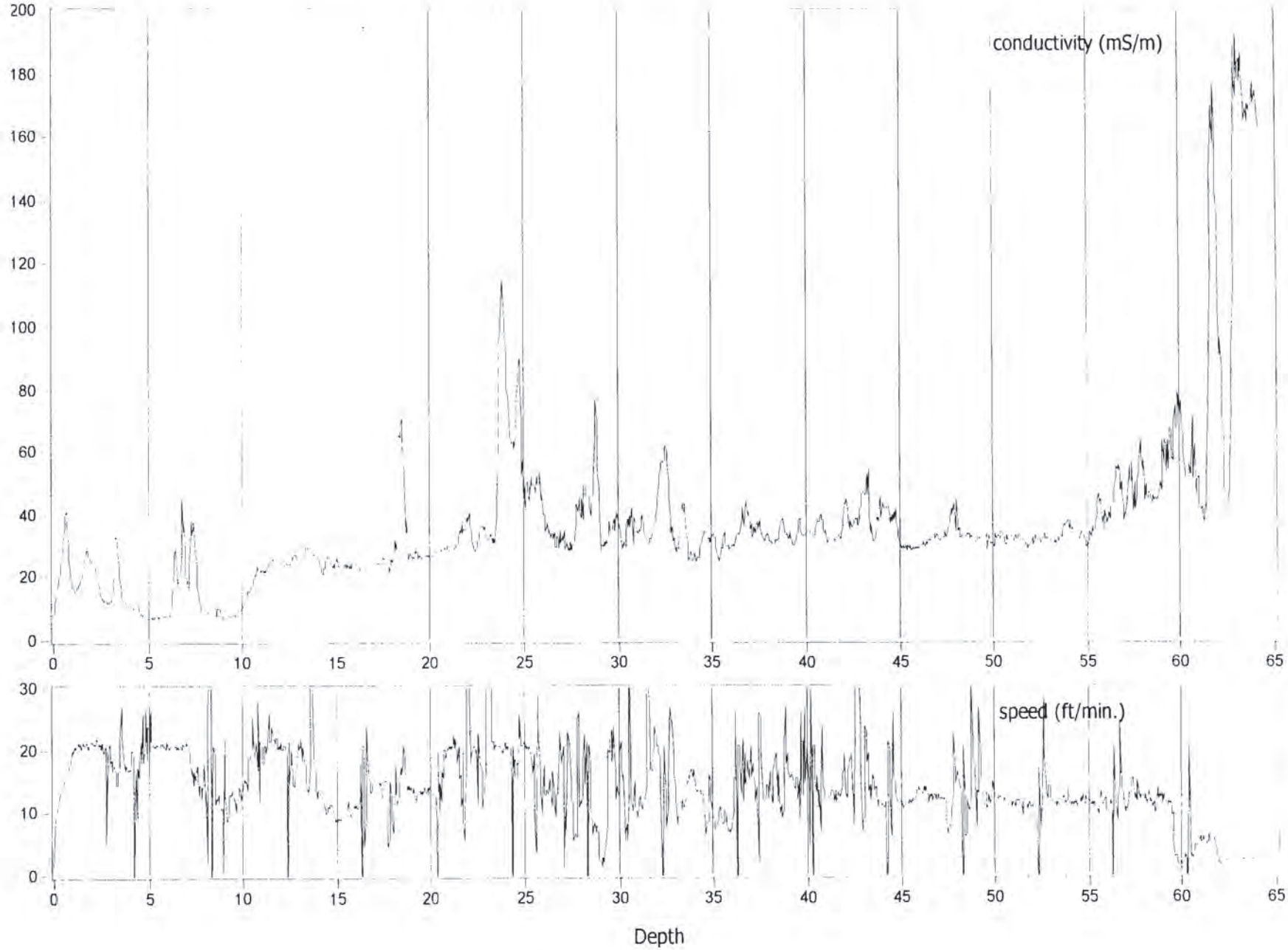
Sampler: Jesse Kalvis
Analyst:
Project Number

Sample ID	Time	Depth	PES ID	Matrix	Comments
GP3-1	9:30 am	16.75'	GP3-1		
GP3-2	10:15 am	13.35'	GP3-2		
GP3-3	10:35 am	19.3'	GP3-3		
GP2 1	10:55 am	55.75'	GP2-1		
GP2-2	11:30 am	42.50'	GP2-2		
GP2-3	1:50 pm	29.00'	GP2-3		
GP1-1	2:10 pm	53.90'	GP1-1		
GP1-2	2:35 pm	64.25'	GP1-2		
GP1-3	3:10 pm	59.40'	GP1-3		
GP1-4	4:00 pm	52.00'	GP1-4		
GP1-5	4:30 pm	45.75'	GP1-5		
GP1-6	5:00 pm	35.80'	GP1-6		
GP2-4	5:25 pm	54.35'	GP2-4		
GP2-5	5:50 pm	52.25'	GP2-5		
4/6/04					
GP5-1	9:00 am	54.50'	GP5-1		
GP5-2	9:35 am	53.40'	GP5-2		
GP4-1	10:10 am	37.30'	GP4-1		
GP4-2	10:35 am	24.50'	GP4-2		1.5' to 13 no data
GP5-3	11:00 am	53.15'	GP5-3		
GP5-4	1:10 pm	16.7'	GP5-4		
GP4-3	2:05 pm	35.8'	GP4-3		
GP3-4	2:30 pm	21.6'	GP3-4		
4/7/04					
GP4-4	8:24 am	58.9'	GP4-4		
GP4-5	8:55 am	59.85'	GP4-5		
GP4-6	9:25 am	60.00'	GP4-6		

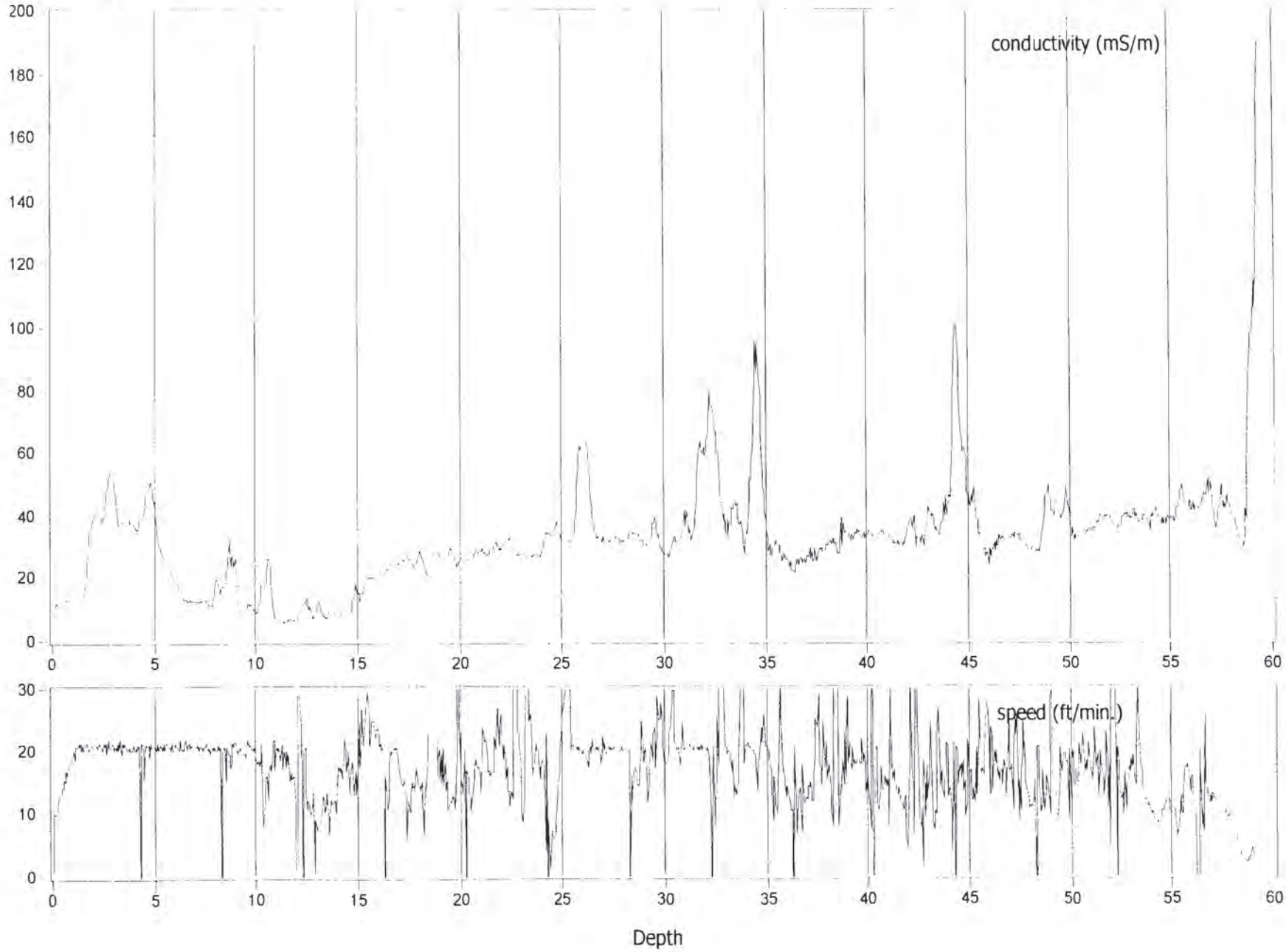
LOG: A:\GP1-1.DAT



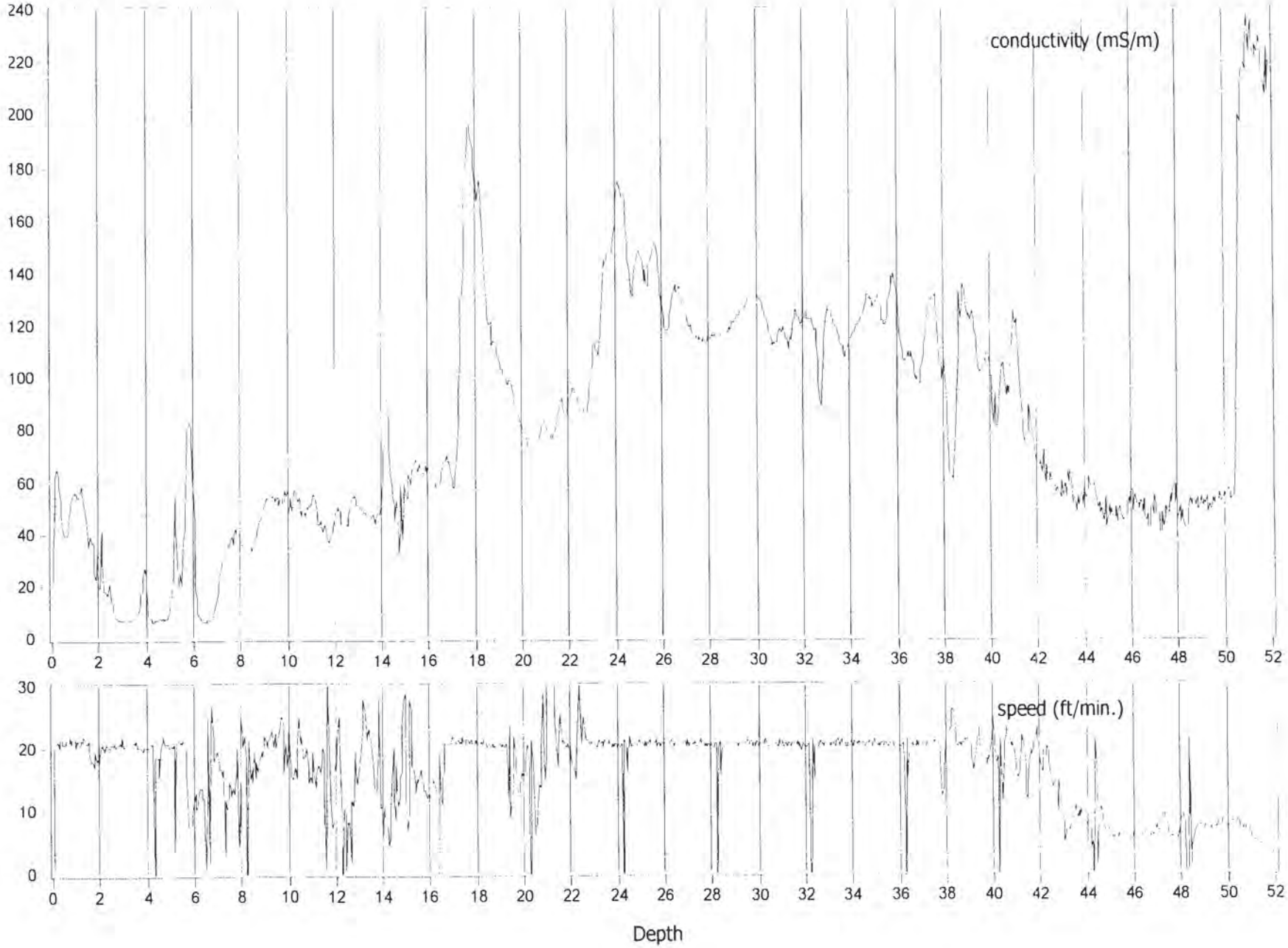
LOG: A:\GP1-2.DAT



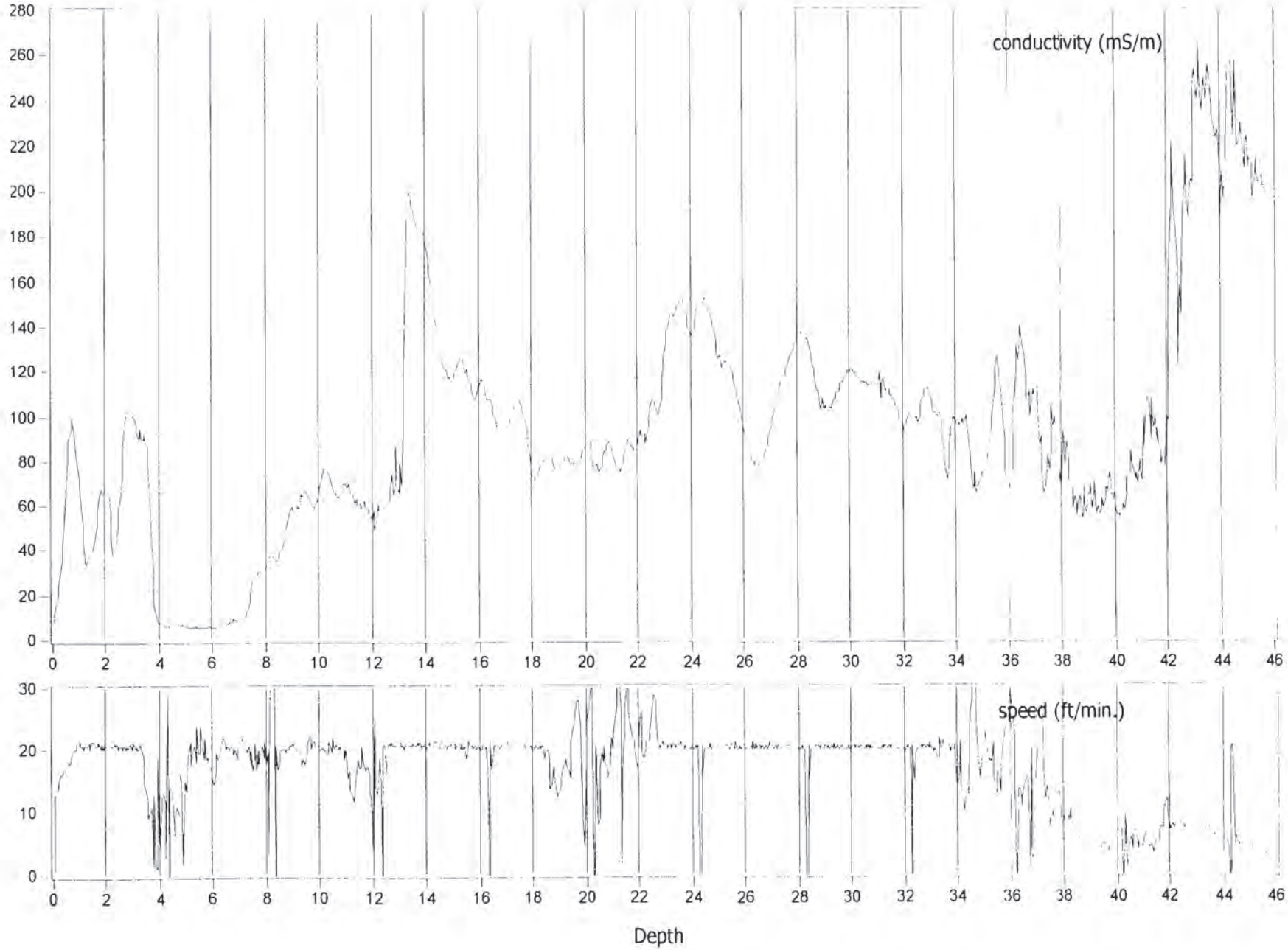
LOG: A:\GP1-3.DAT



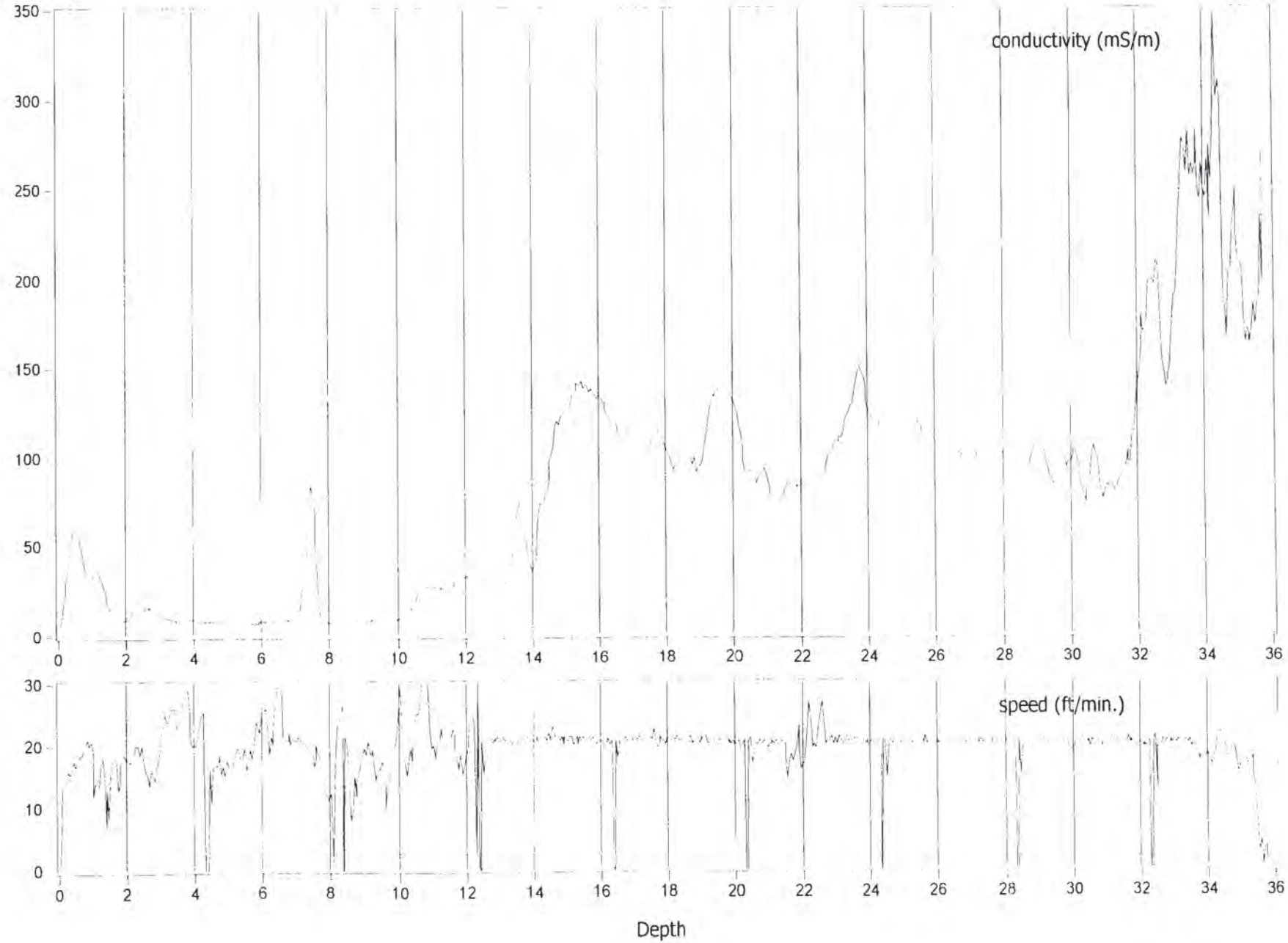
LOG: A:\GP1-4.DAT



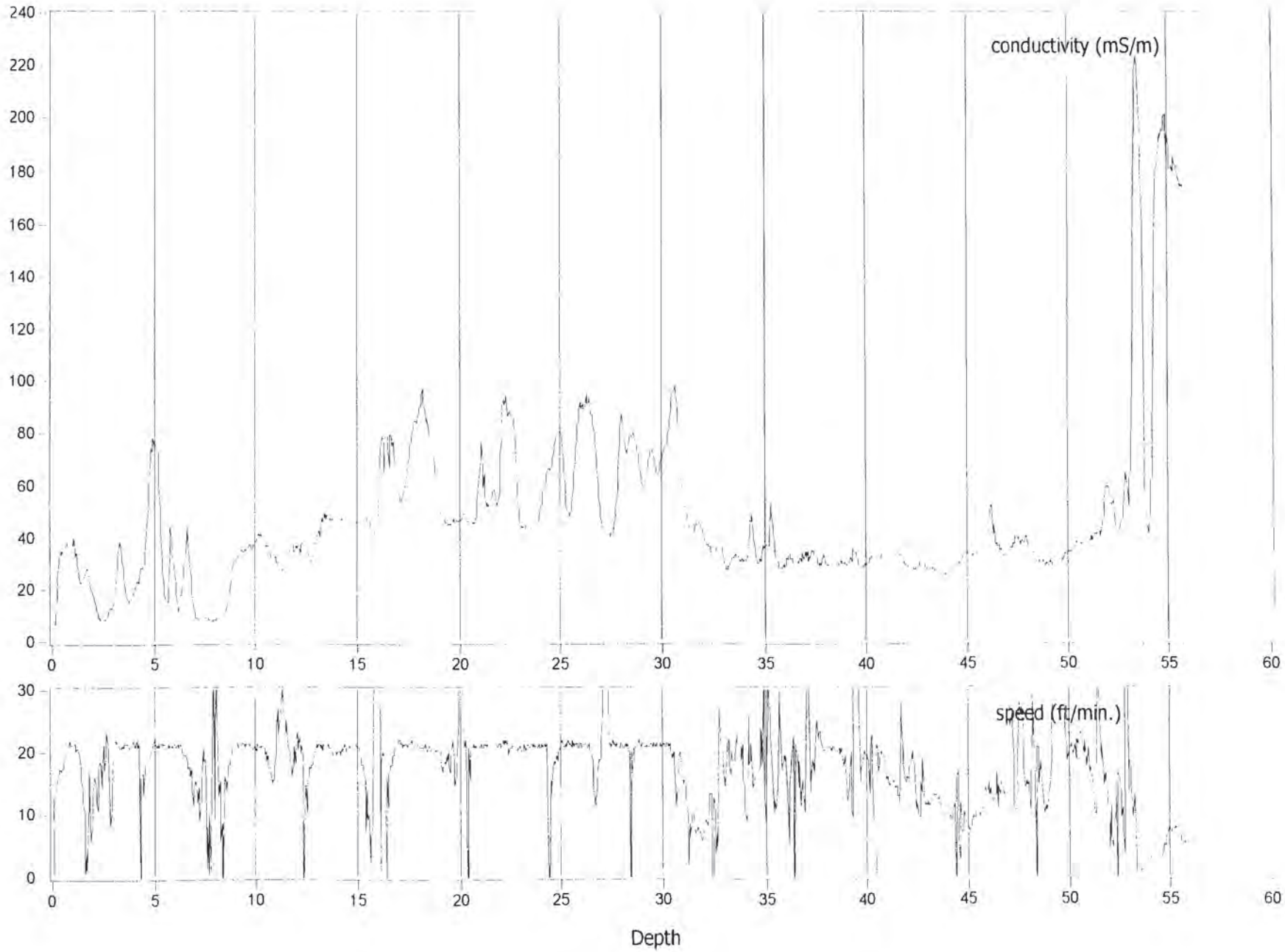
LOG: A:\GP1-5.DAT



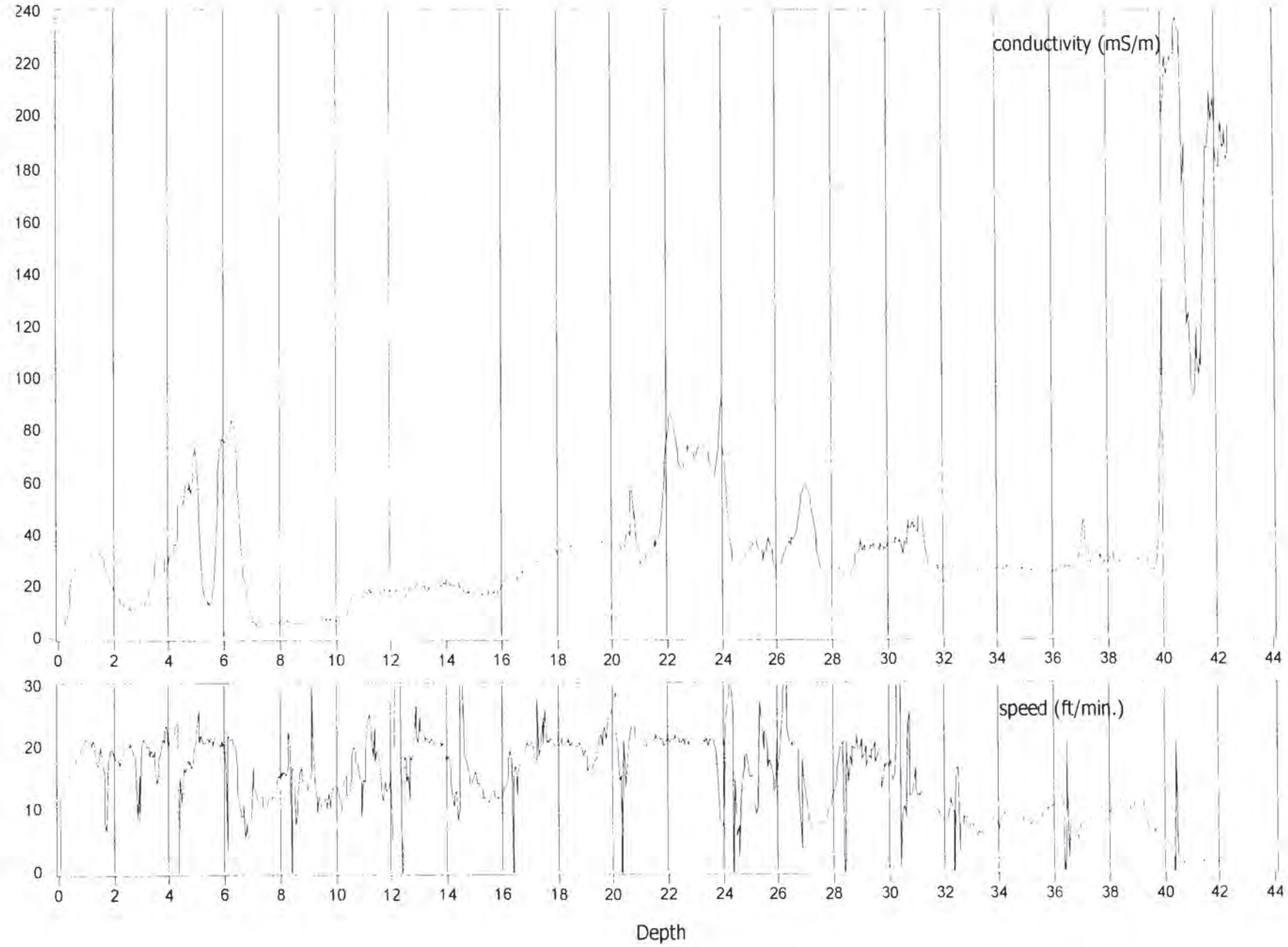
LOG: A:\GP1-6.DAT



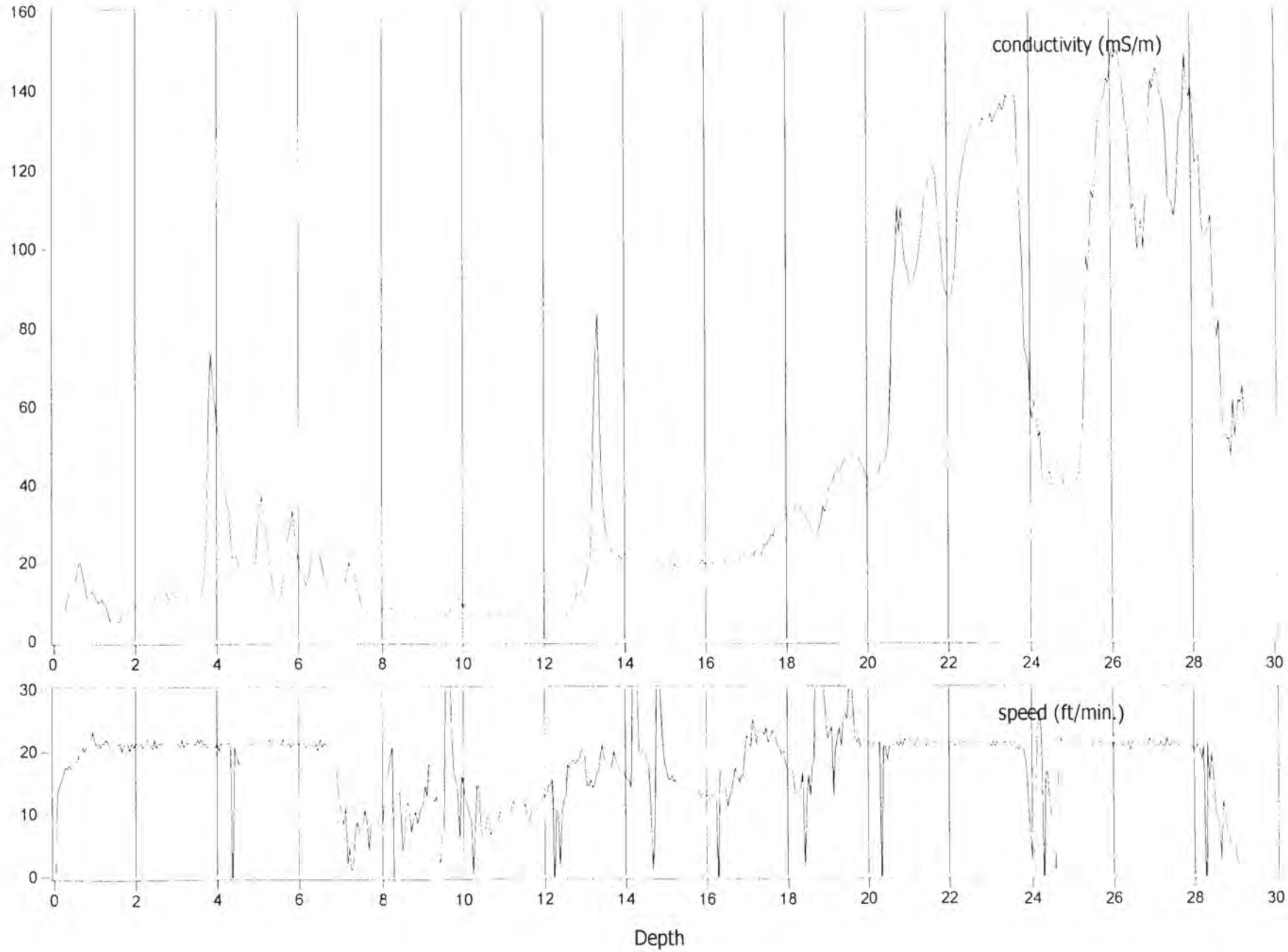
LOG: A:\GP2-1.DAT



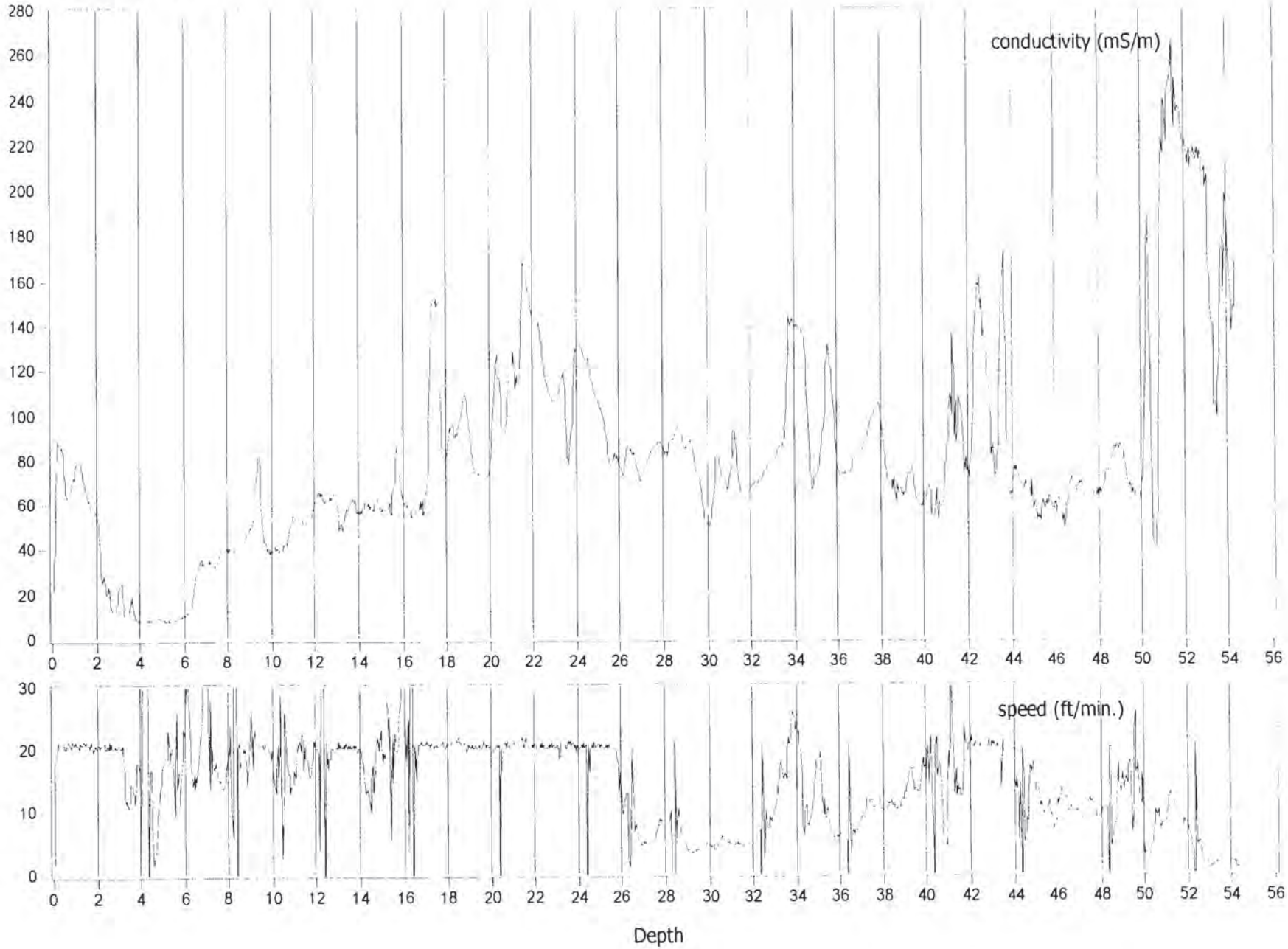
LOG: A:\GP2-2.DAT



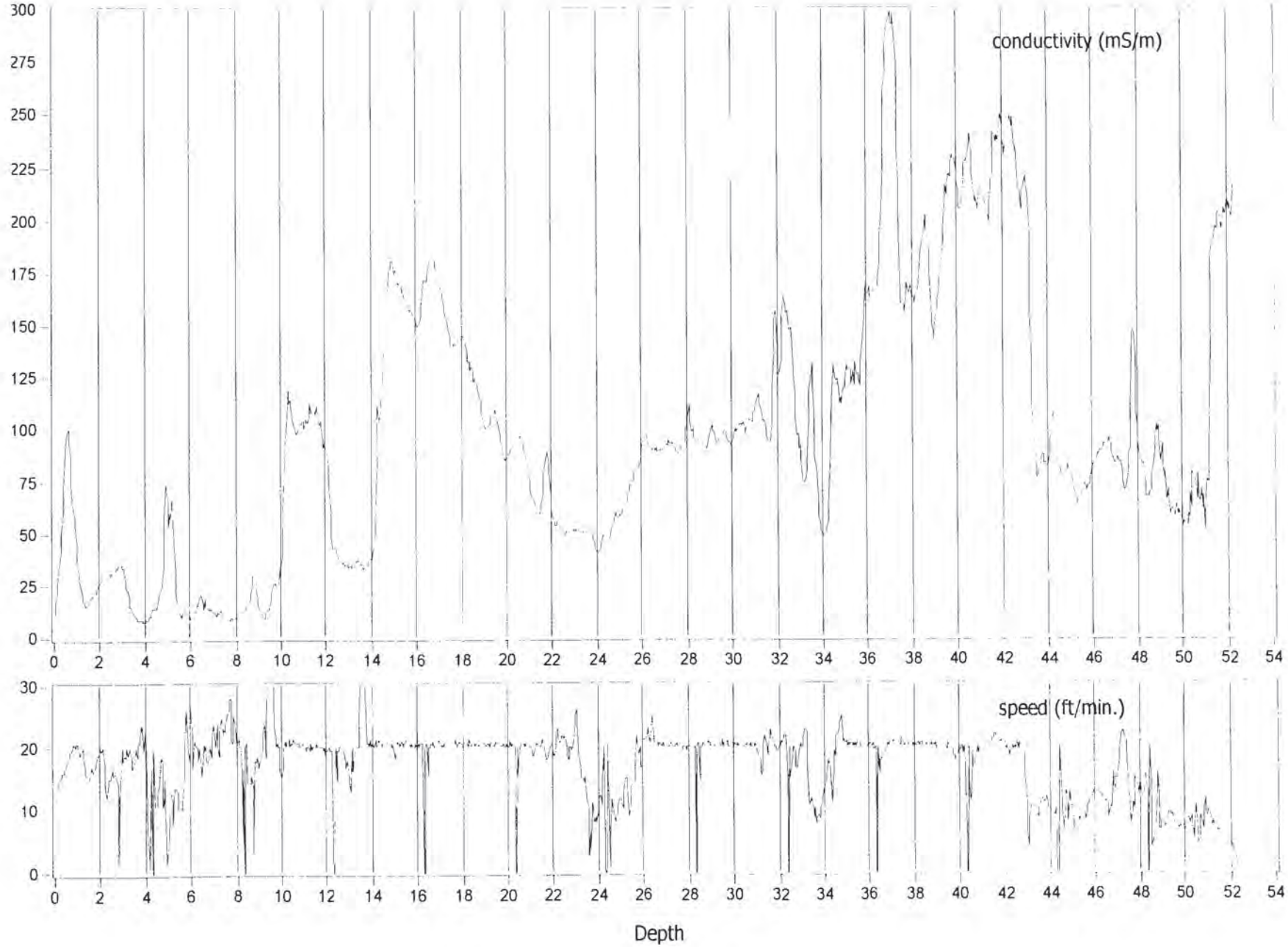
LOG: A:\GP2-3.DAT



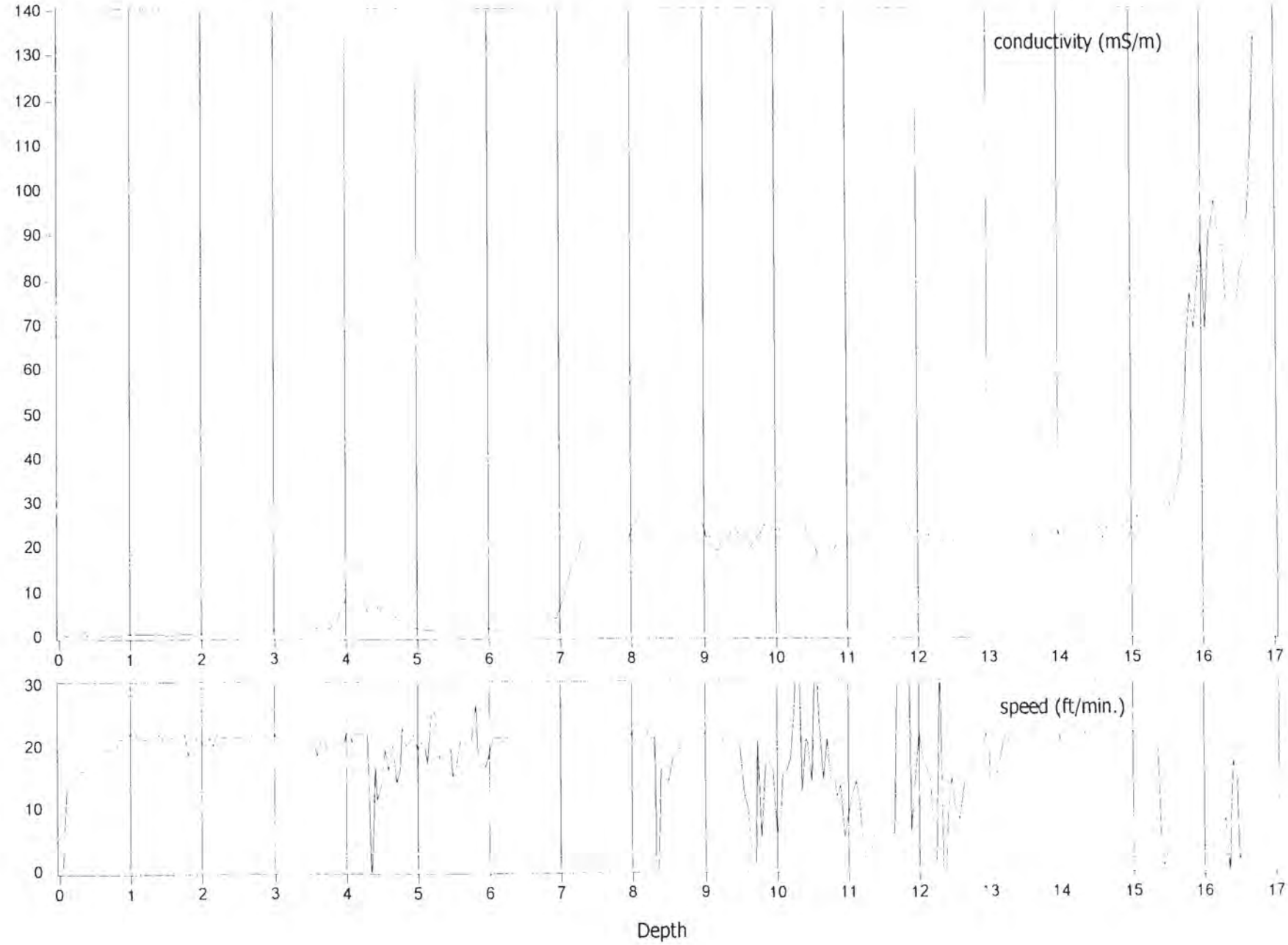
LOG: A:\GP2-4.DAT



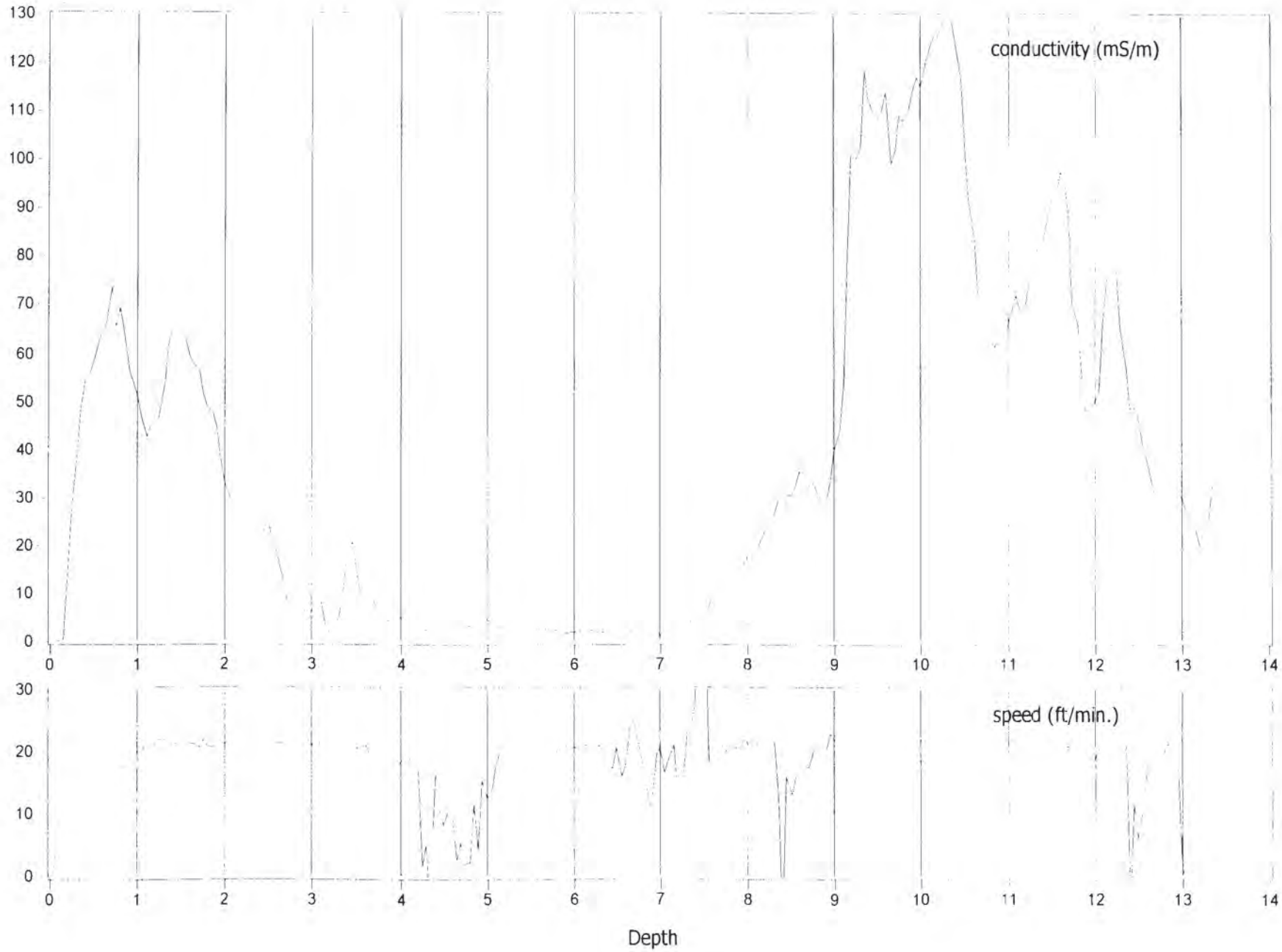
LOG: A:\GP2-5.DAT



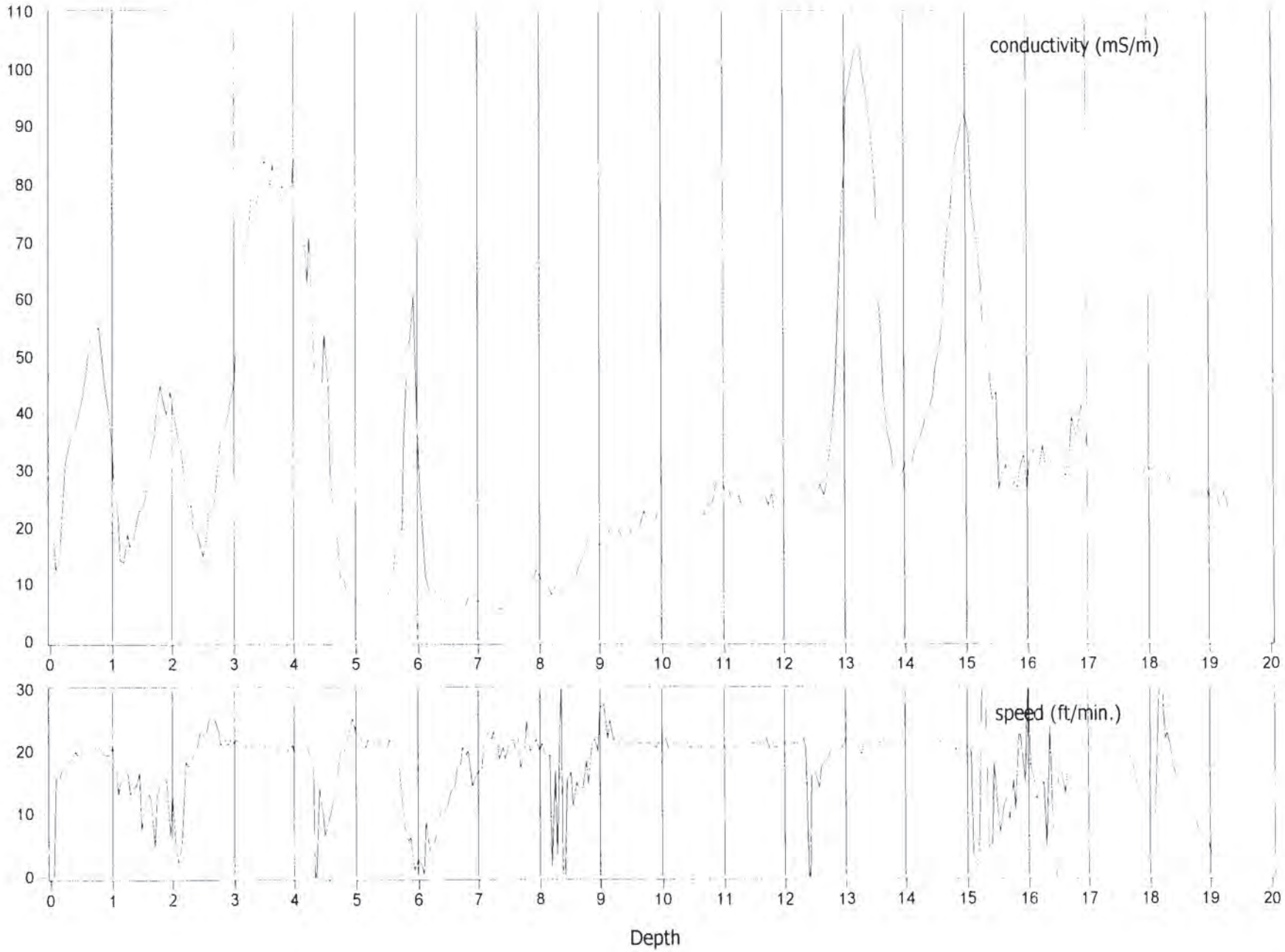
LOG: A:\GP3-1.DAT



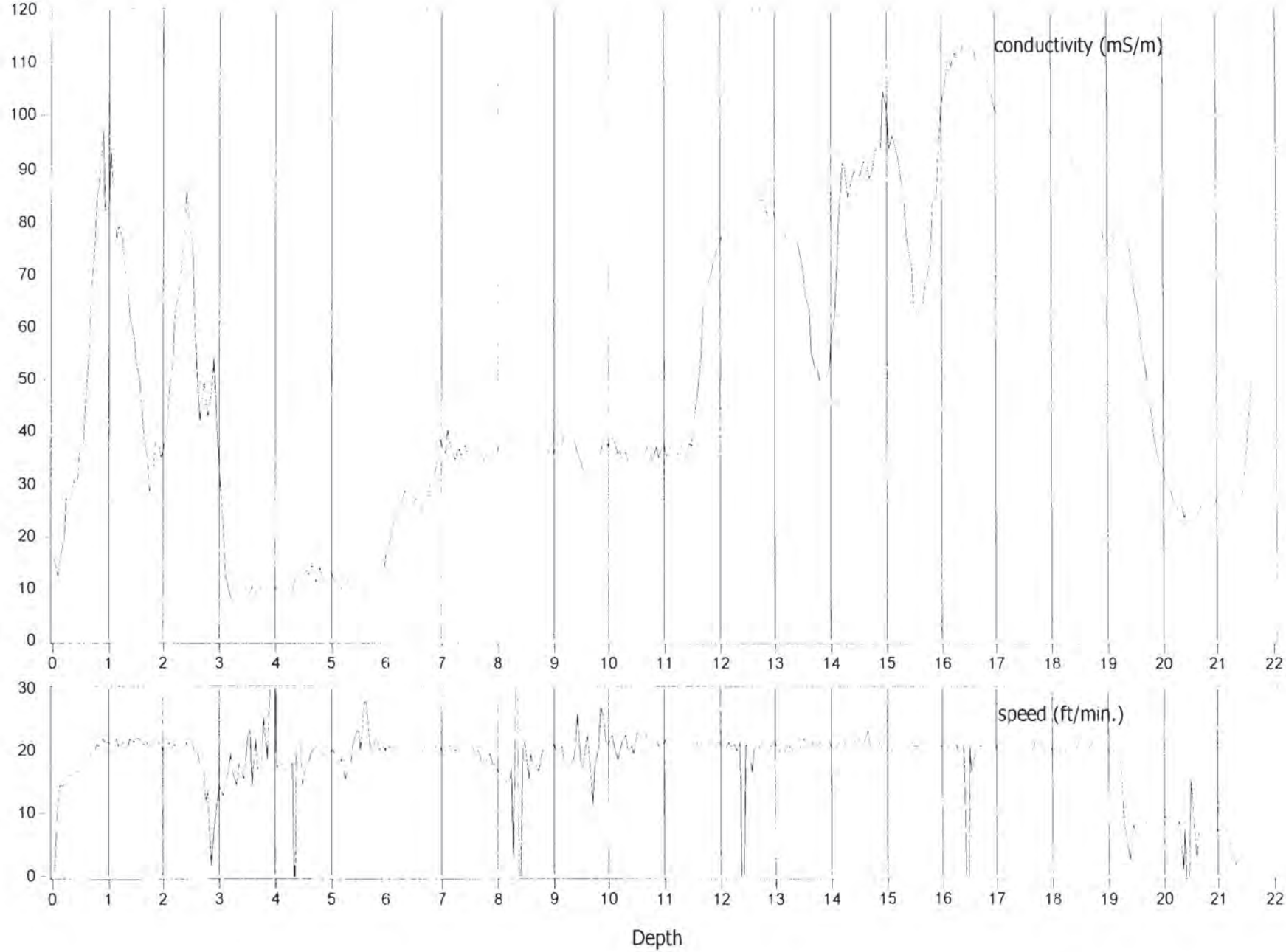
LOG: A:\GP3-2.DAT



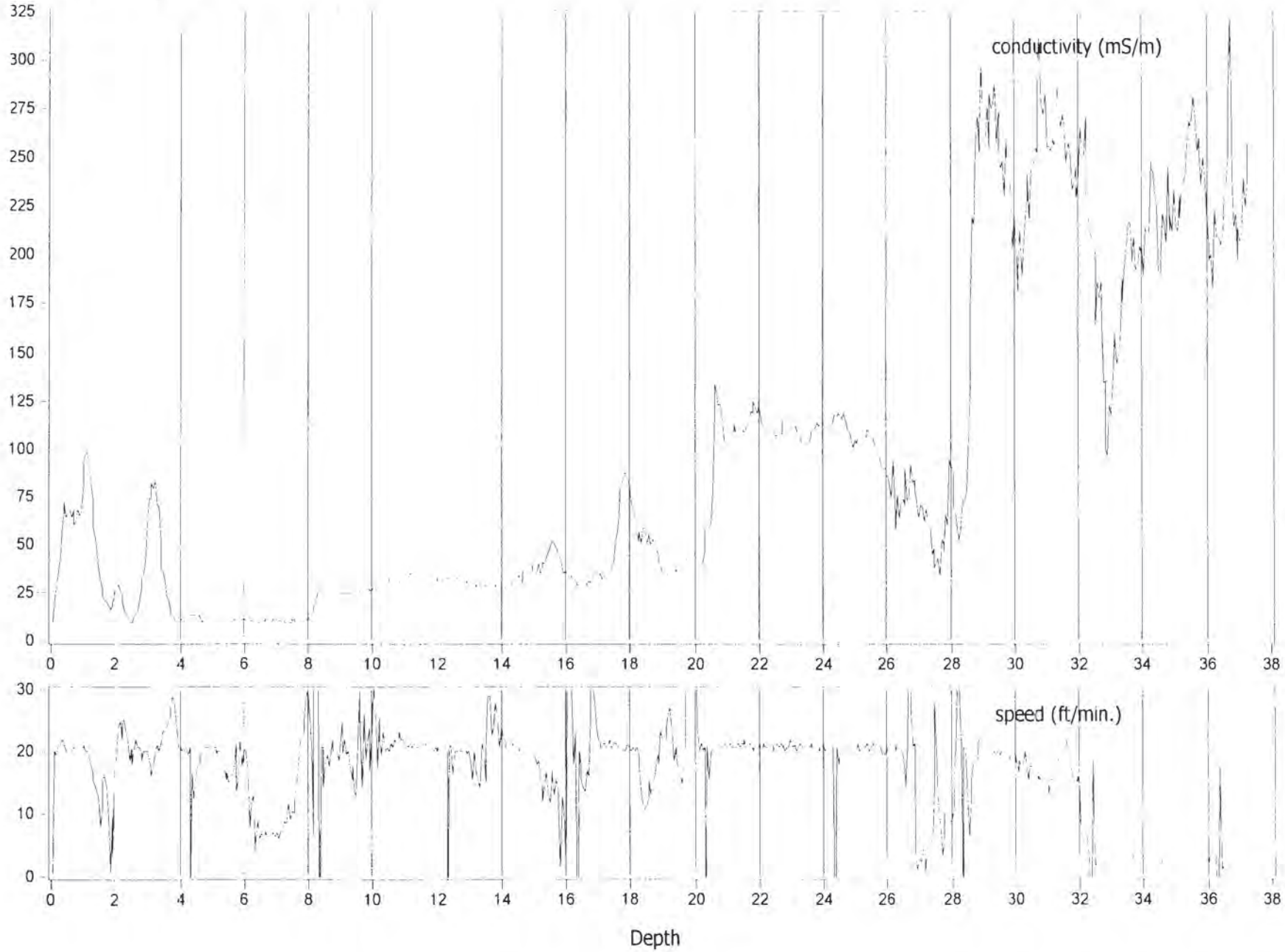
LOG: A:\GP3-3.DAT



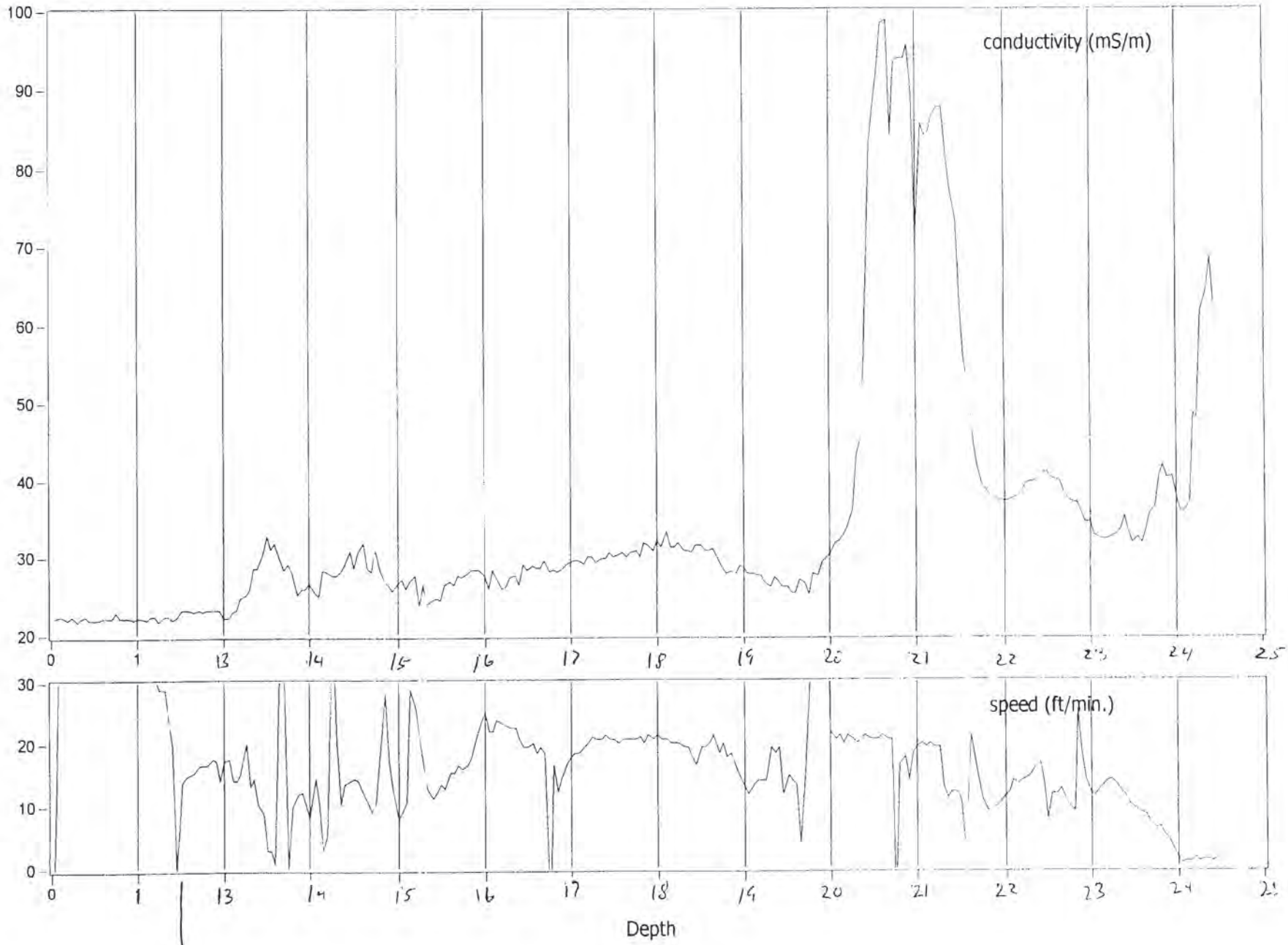
LOG: A:\GP3-4.DAT



LOG: A:\GP4-1.DAT

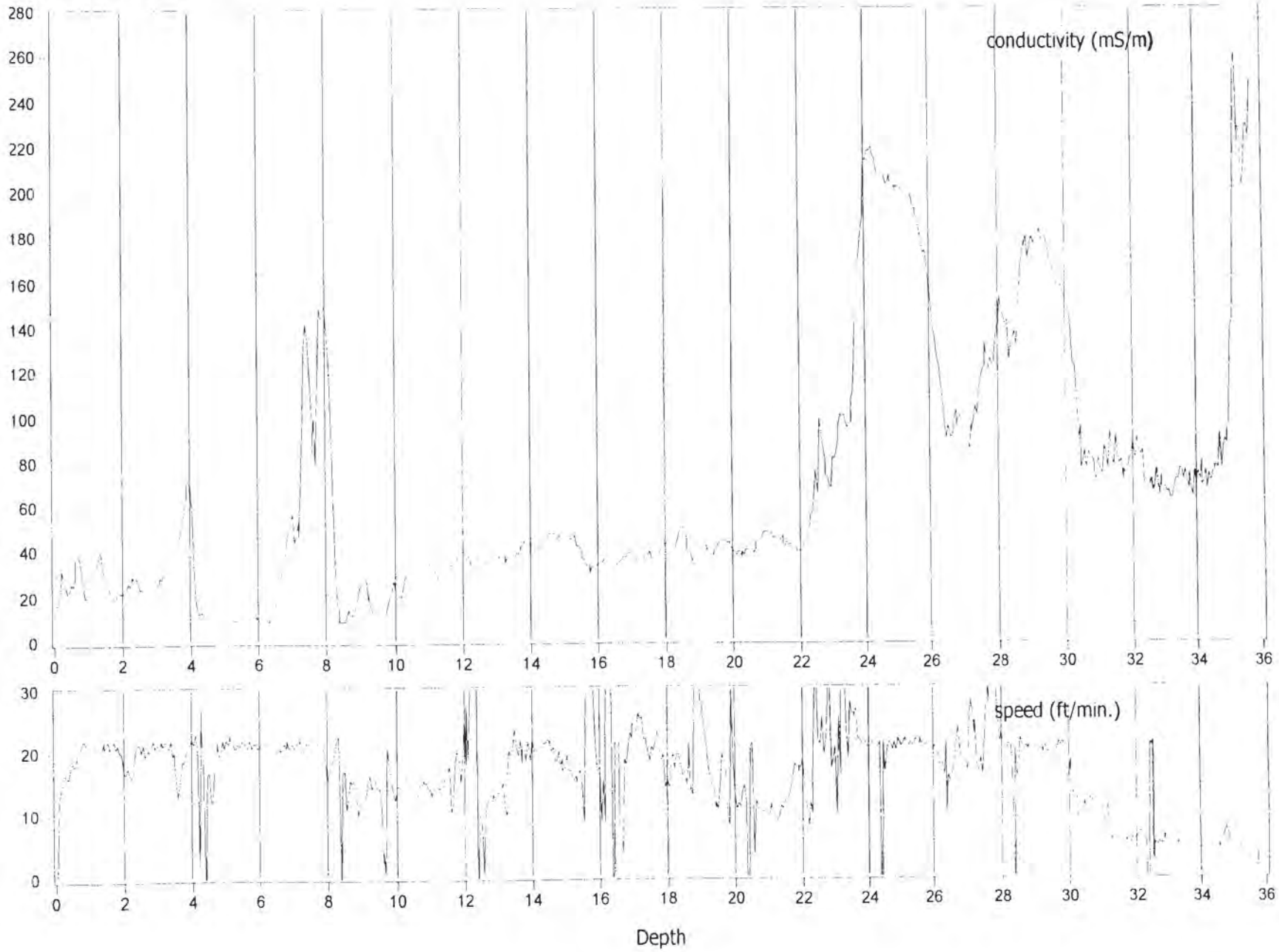


LOG: A:\GP4-2.DAT

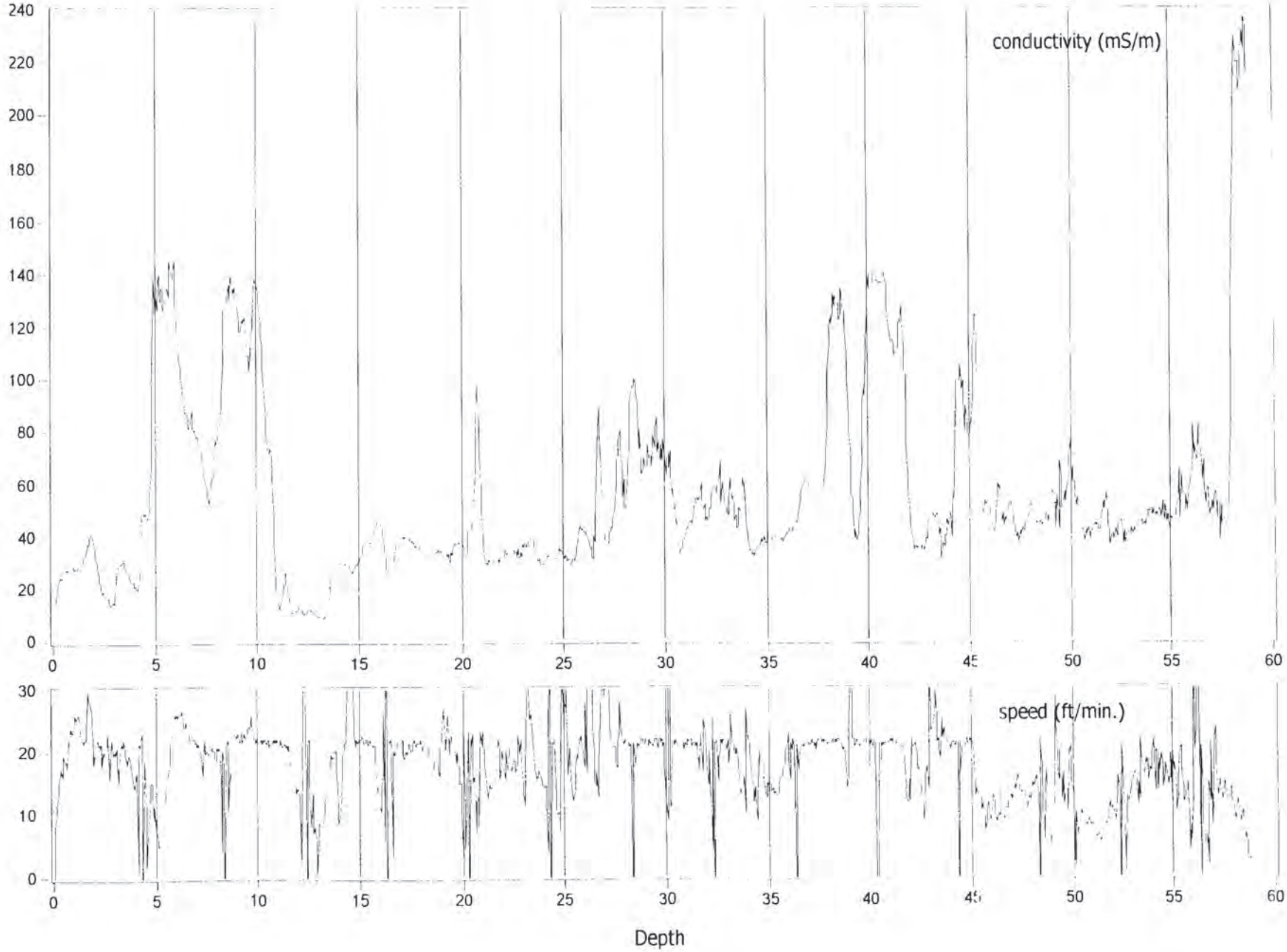


restart here

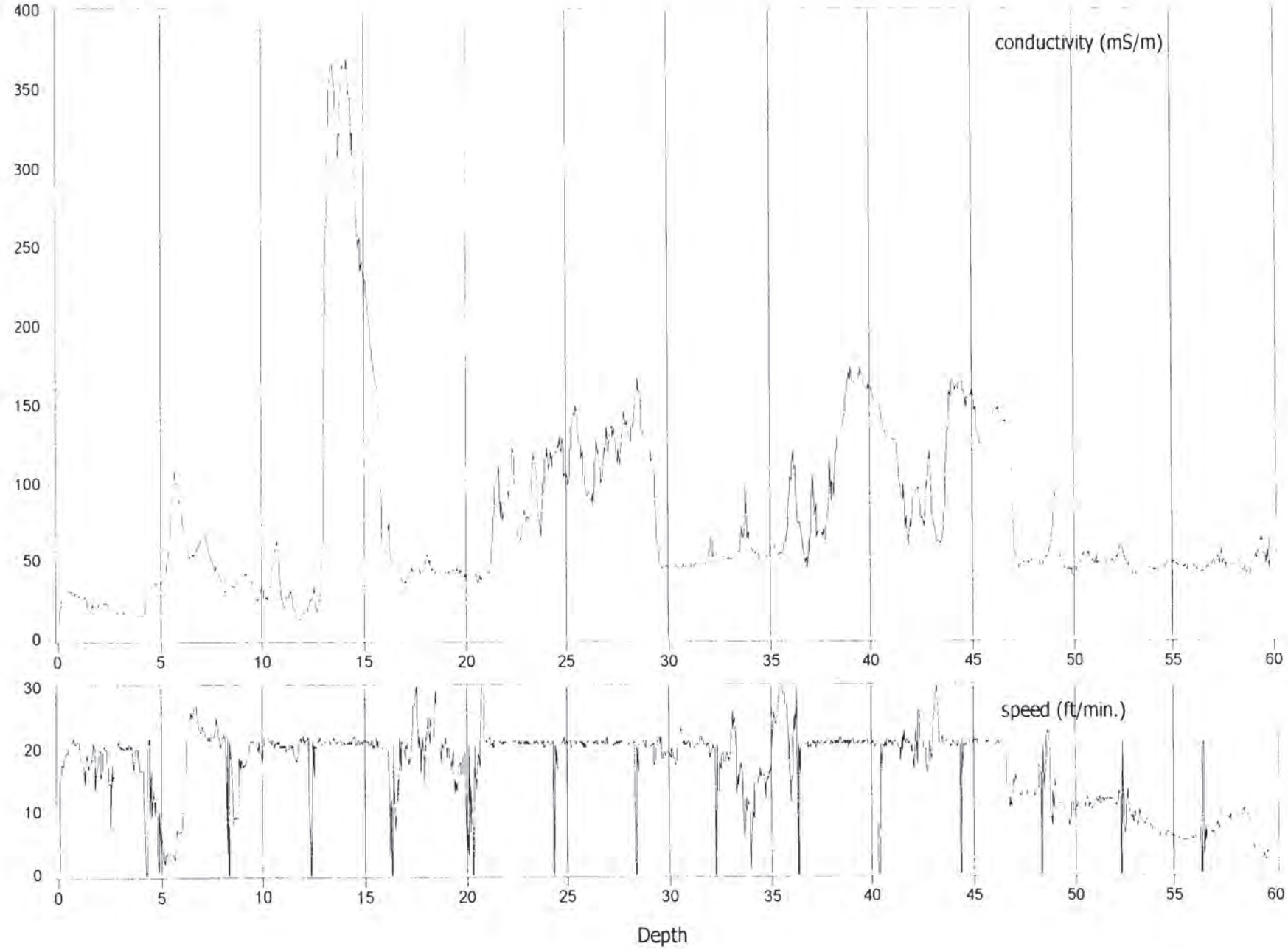
LOG: A:\GP4-3.DAT



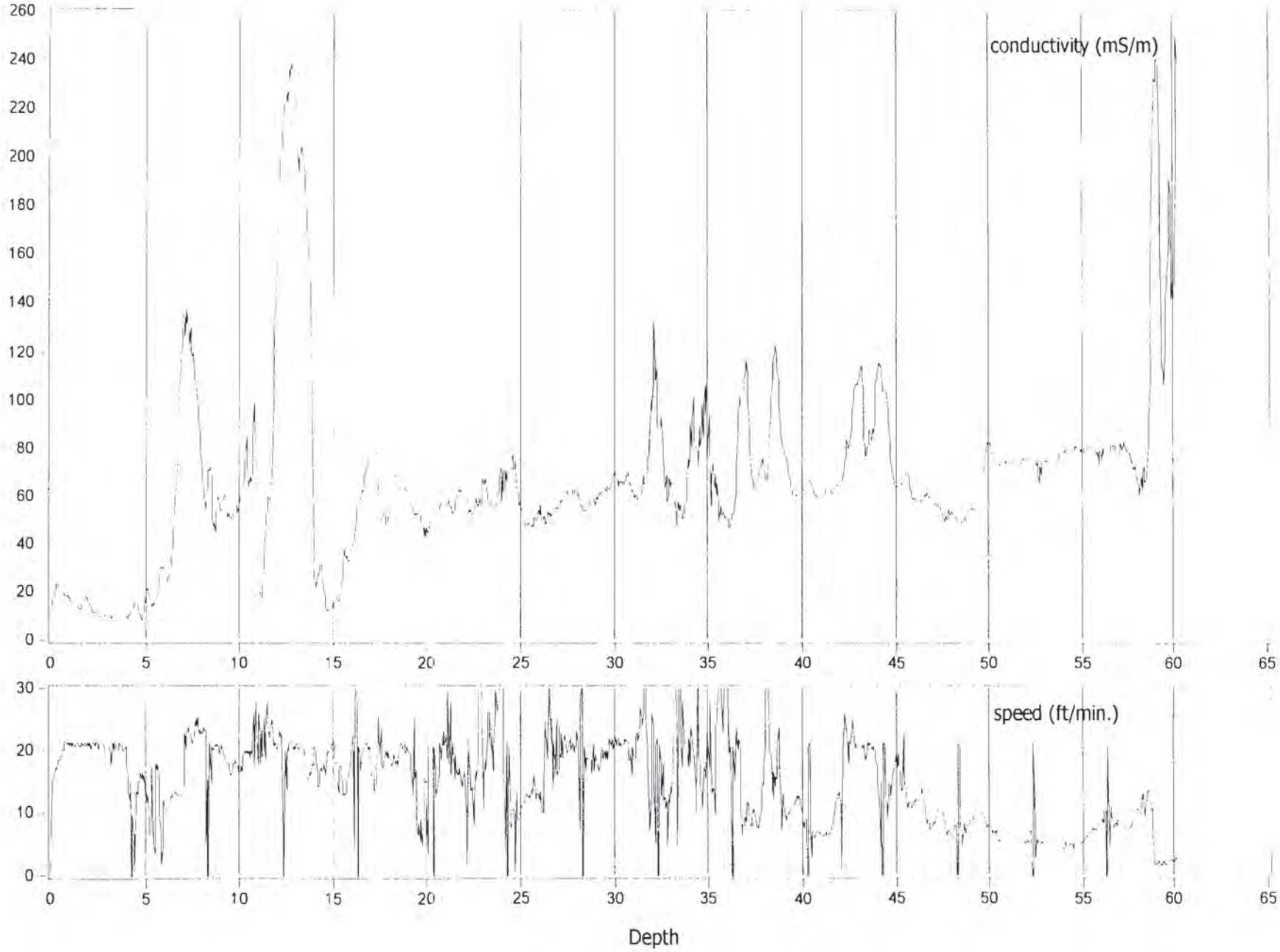
LOG: A:\GP4-4.DAT



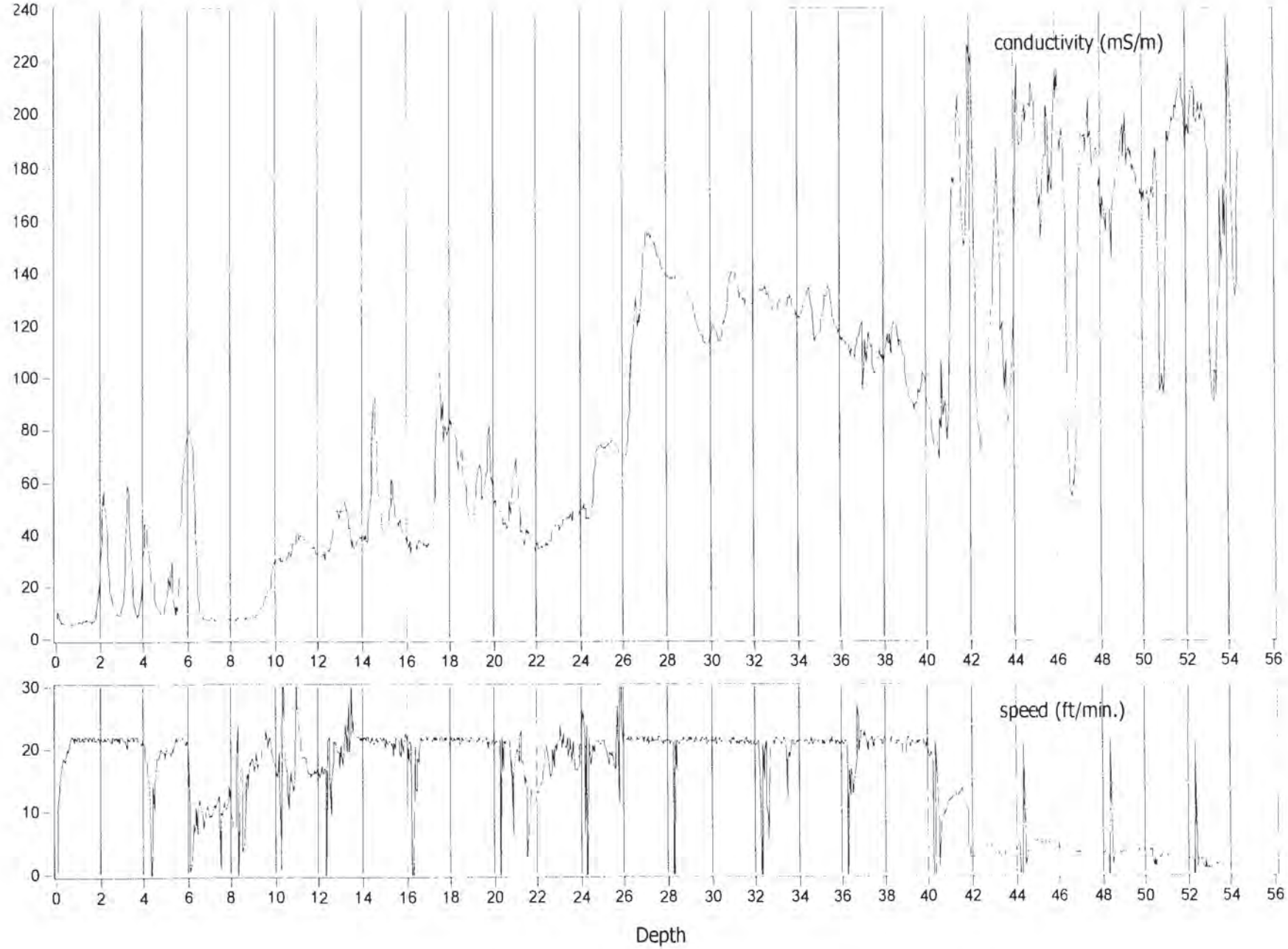
LOG: A:\GP4-5.DAT



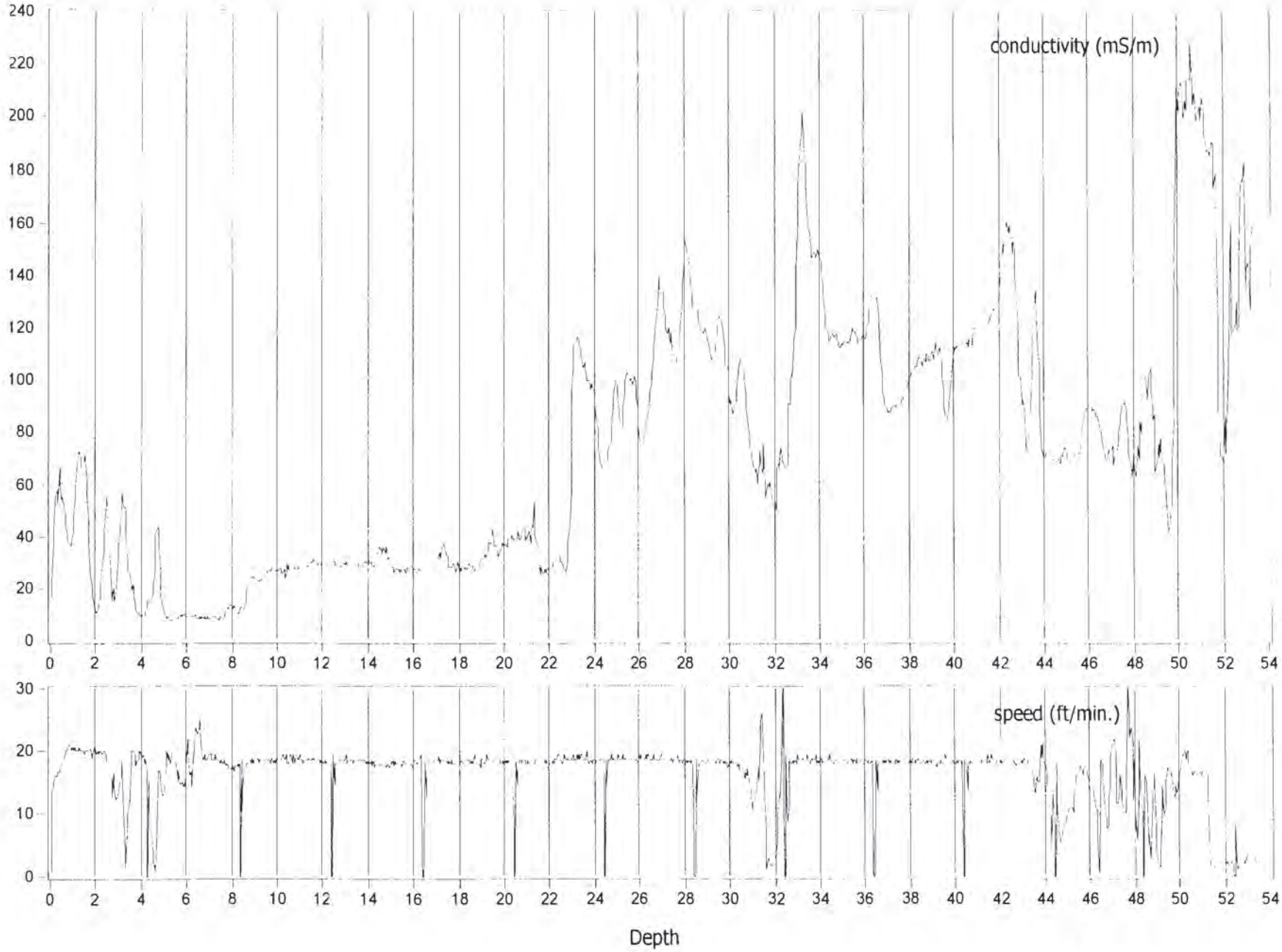
LOG: A:\GP4-6.DAT



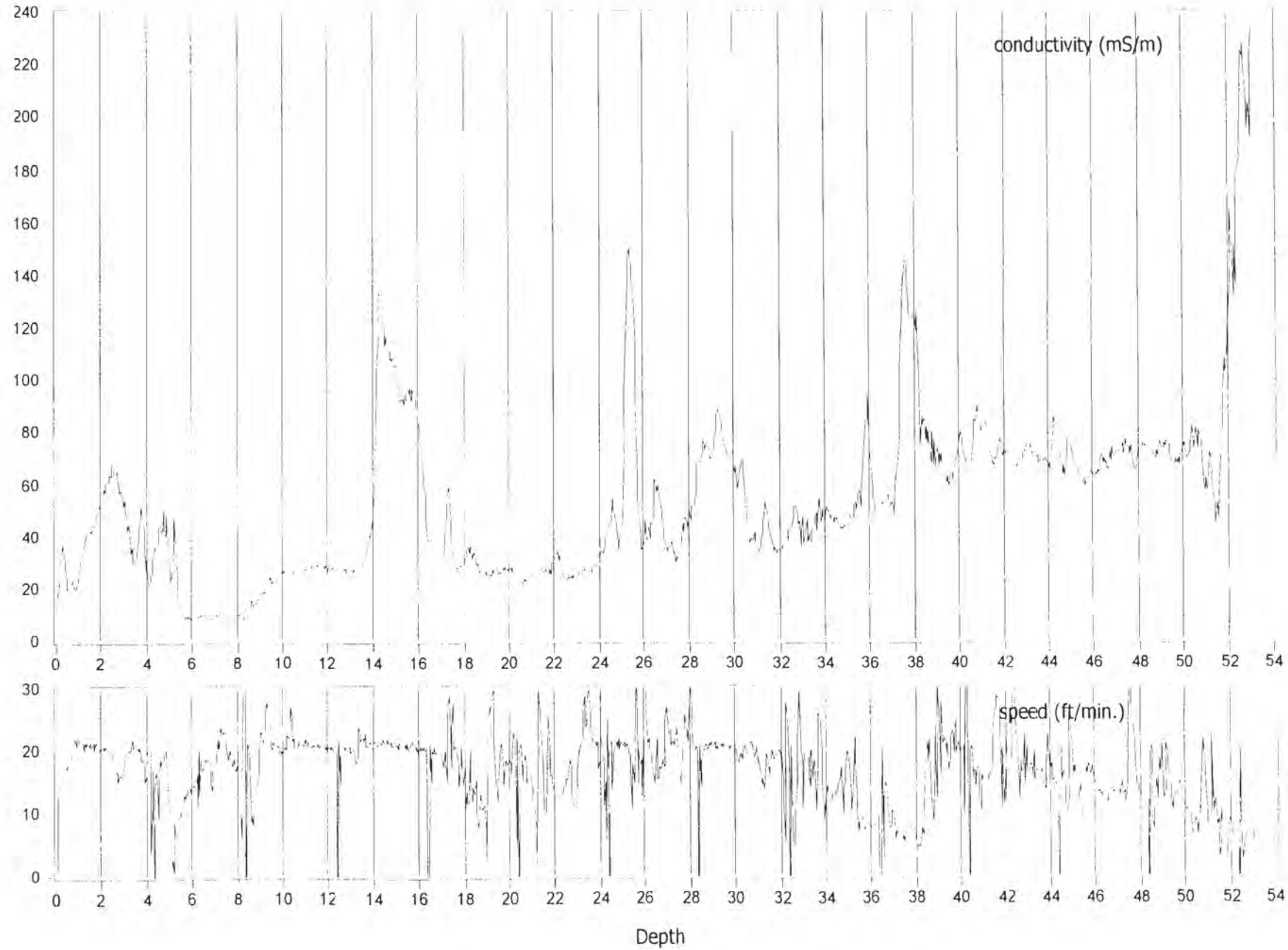
LOG: A:\GP5-1.DAT



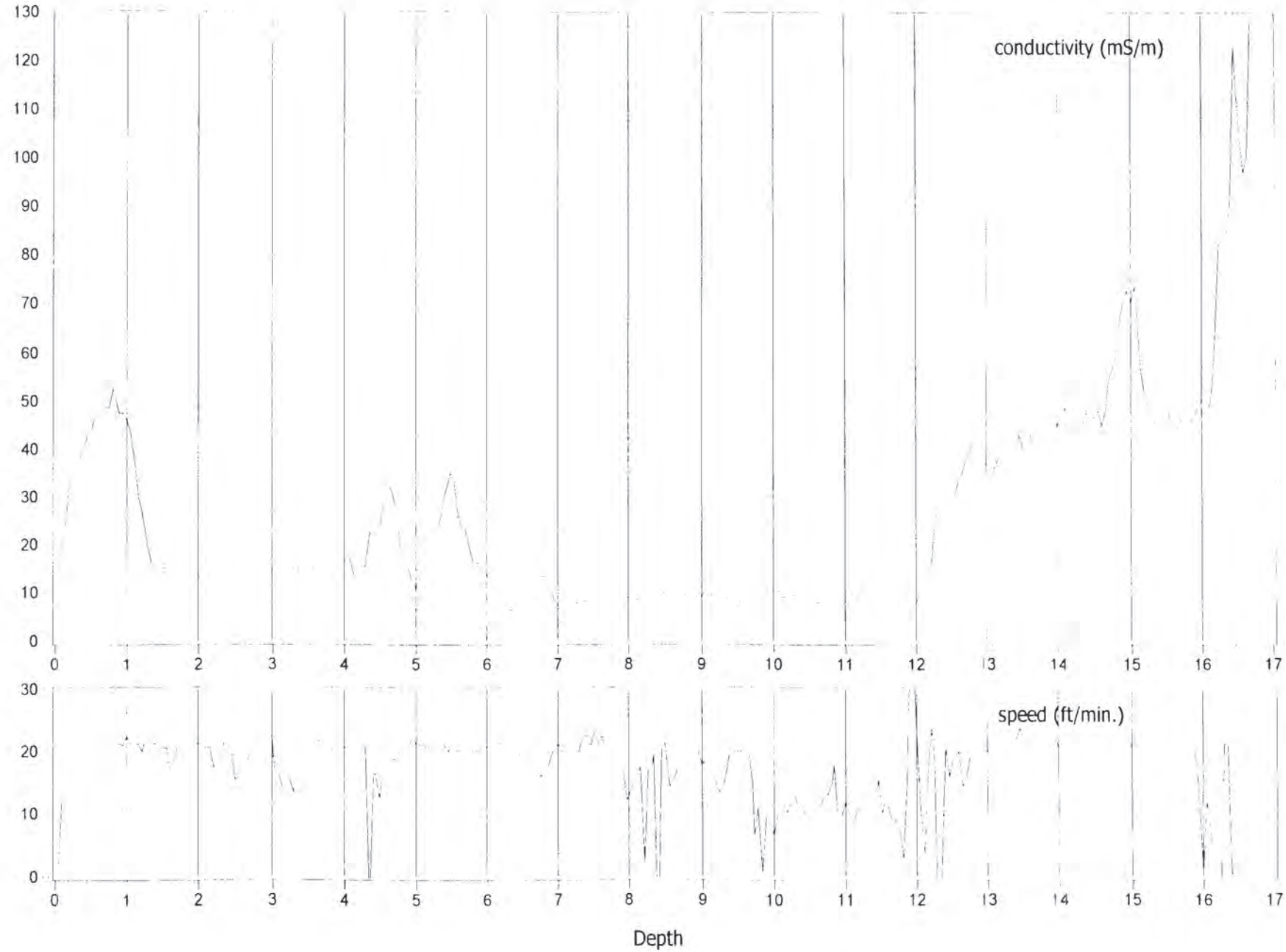
LOG: A:\GP5-2.DAT



LOG: A:\GP5-3.DAT

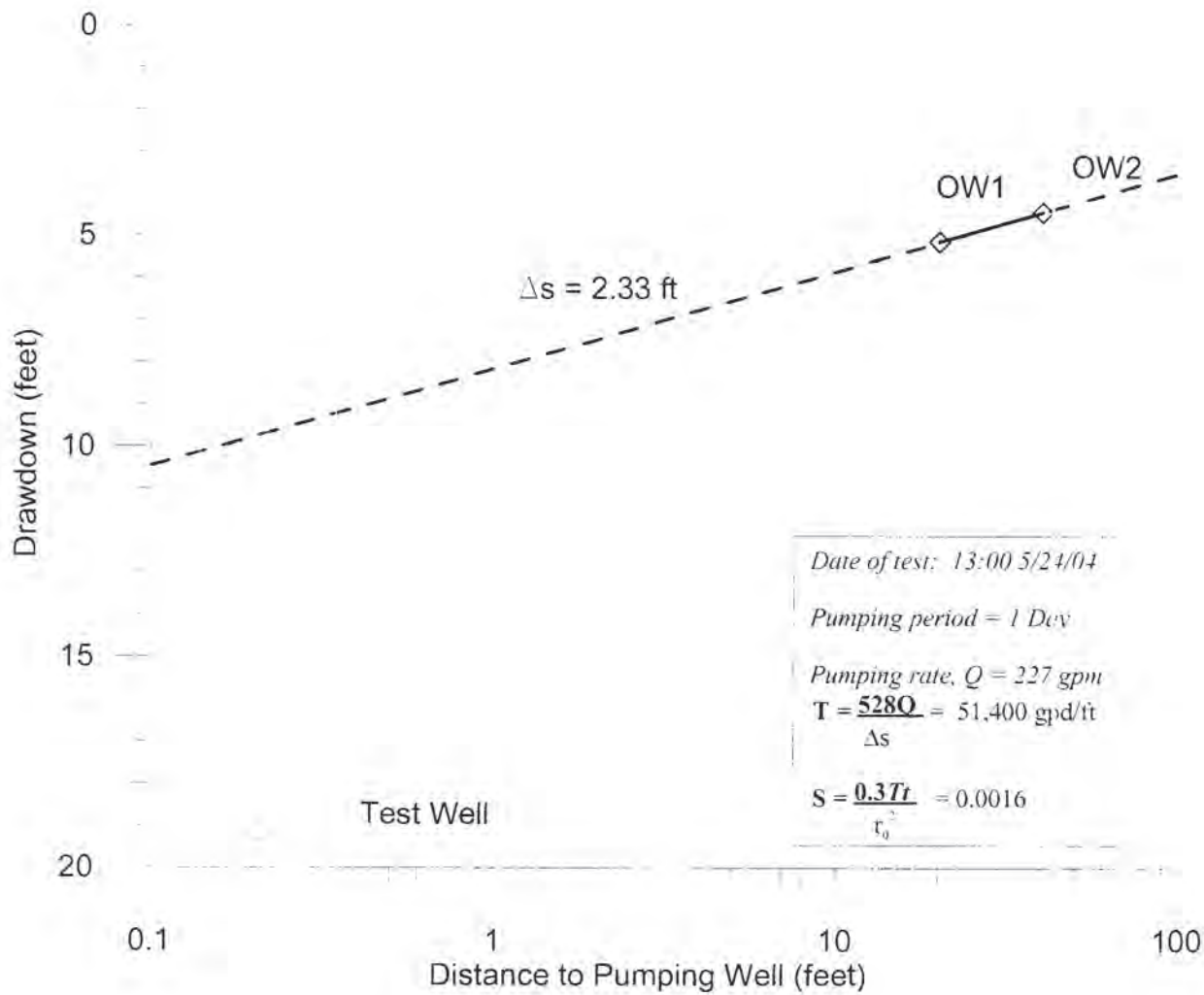


LOG: A:\GP5-4.DAT



Attachment 4

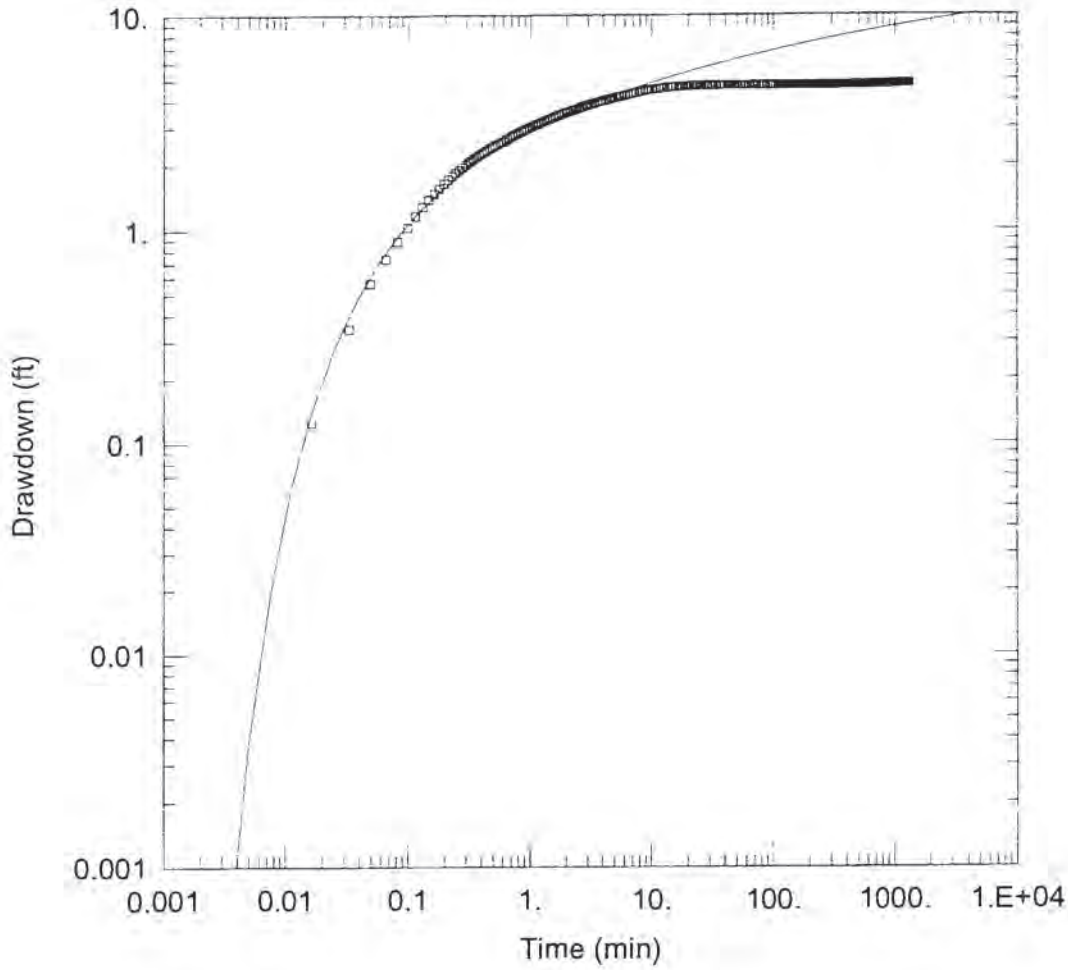
Pump Test Data



Burns & McDonnell

DISTANCE-DRAWDOWN AFTER 24 HOURS

24hrDD.GRF 6/4/04



24-HOUR TEST

Data Set: J:\HAYS\30159\2004DR~1\PUMPTE~1\HAYSOW1.AQT
Date: 05/26/04 Time: 10:47:38

PROJECT INFORMATION

Company: Burns & McDonnell
Client: City of Hays
Project: 30159
Test Location: Line 2
Test Well: TW
Test Date: 5/19/04

AQUIFER DATA

Saturated Thickness: 40. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW	0	0

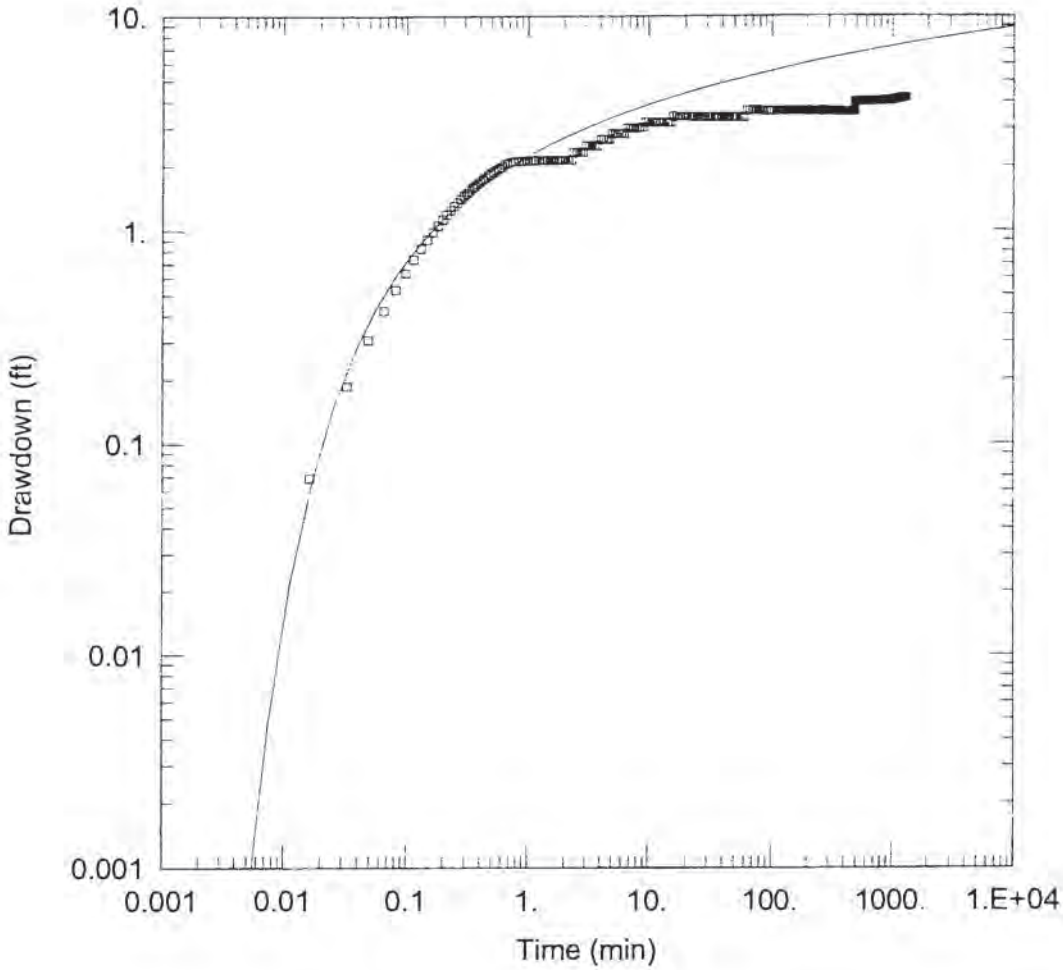
Observation Wells

Well Name	X (ft)	Y (ft)
▫ OW1	20	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 2.818 ft^2/min = 4060 ft2/day = 30,370 gpd/ft
S = 0.0005447



24-HOUR TEST

Data Set: J:\HAYS\30159\2004DR~1\PUMPTE~1\HAYSOW2.AQT
Date: 05/26/04 Time: 10:48:23

PROJECT INFORMATION

Company: Burns & McDonnell
Client: City of Hays
Project: 30159
Test Location: Line 2
Test Well: TW
Test Date: 5/19/04

AQUIFER DATA

Saturated Thickness: 40. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
TW	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ OW2	40	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 3.334 ft^2/min = 4800 ft2/day = 35,900 gpd/ft
S = 0.0002222

Attachment 5

Cost Tables

HAYS, KANSAS
WELL RELOCATION
OPINION OF PROBABLE PROJECT COST

Item	Quantity	Unit	Unit Cost	Cost ($)
ALTERNATIVE #1				
Submersible Pump (with pitless adaptor)				
East Side				
Well Construction	3	EA	$51,000	$153,000
500 gpm Pump	3	EA	$11,000	$33,000
Pitless Adaptor & Valve Vault	3	EA	$62,000	$186,000
Monitoring Well	3	EA	$1,500	$4,500
Transmission	11,400	LF	$48	$547,000
River Crossing	1	LS	na	$44,000
Power Supply	1	LS	$0	$0
Electrical (Platform)	3	EA	$20,000	$60,000
Power Dist. Equipment & Motor Controls	3	EA	$16,000	$48,000
SCADA (includes WTP Improvements)	4	EA	$15,000	$60,000
Site Work (access road, backfill)	1	LS	na	$29,000
Demolition (Wells S15 & S17)	2	EA	$4,000	$8,000
Chlorination Facility				
Building	1	EA	$9,000	$9,000
Equipment	1	EA	$46,000	$46,000
SCADA/Instruments	1	EA	$24,000	$24,000
Demolition (Existing Facility)	1	EA	$3,000	$3,000
Subtotal				$1,255,000
Contingency @ 25%				$314,000
East Side Total				**$1,569,000**
West Side				
Well Construction	3	EA	$51,000	$153,000
500 gpm Pump	3	EA	$11,000	$33,000
Pitless Adaptor & Valve Vault	2	EA	$62,000	$124,000
Well S-7 Piping Connect	1	EA	$10,000	$10,000
Monitoring Well	3	EA	$1,500	$4,500
Transmission	2700	LF	$48	$130,000
Power Supply	1	LS	$0	$0
Electrical (Platform)	3	EA	$20,000	$60,000
Power Dist. Equipment & Motor Controls	3	EA	$16,000	$48,000
SCADA (includes WTP Improvements)	3	EA	$15,000	$45,000
Site Work (access road, backfill)	1	LS	na	$21,000
Demolition	2	EA	$4,100	$8,200
Chlorination Facility (SCADA/Instruments only)	1	EA	$24,000	$24,000
Subtotal				$661,000
Contingency @ 25%				$165,000
West Side Total				**$826,000**
Subtotal				$2,395,000
[1]Other Costs @ 25%				$599,000
Alternative #1 Project Cost				**$2,994,000**

Note:
1. Includes development of raw water model, hydrologic modeling for obstructions in streams permit, and water rights permitting

HAYS, KANSAS
WELL RELOCATION
OPINION OF PROBABLE PROJECT COST

Item	Quantity	Unit	Unit Cost	Cost ($)
ALTERNATIVE #2				
Vertical Turbine Pump (with well house)				
East Side				
Well Construction	3	EA	$51,000	$153,000
Well House & Piping Appurtenances	3	EA	$58,000	$174,000
500 gpm Pump	3	EA	$27,000	$81,000
Monitoring Well	3	EA	$1,500	$4,500
Transmission	11,400	LF	$48	$547,000
River Crossing	1	LS	na	$44,000
Electrical	3	EA	$21,500	$64,500
Power Supply	1	LS	$0	$0
SCADA (includes WTP Improvements)	4	EA	$15,000	$60,000
Site Work (access roads, backfill)	1	LS	na	$45,000
Demolition (Wells S15 & S17)	2	EA	$4,000	$8,000
Chlorination Facility				
Building	1	EA	$9,000	$9,000
Equipment	1	EA	$46,000	$46,000
SCADA/Instruments	1	EA	$24,000	$24,000
Demolition	1	EA	$3,000	$3,000
Subtotal				$1,263,000
Contingency @ 25%				$316,000
East Side Total				**$1,579,000**
West Side				
Well Construction	3	EA	$51,000	$153,000
Well House & Piping Appurtenances	2	EA	$58,000	$116,000
Well S-7 Piping Connect	1	EA	$10,000	$10,000
500 gpm Pump	3	EA	$27,000	$81,000
Monitoring Well	3	EA	$1,500	$4,500
Transmission	2700	LF	$48	$130,000
Electrical	3	EA	$21,500	$64,500
Power Supply	1	LS	$0	$0
SCADA (includes WTP Improvements)	3	EA	$15,000	$45,000
Site Work (access roads, backfill)	1	LS	na	$37,000
Demolition (Wells S6 & S8)	2	EA	$4,100	$8,200
Chlorination Facility (SCADA/Instruments only)	1	EA	$24,000	$24,000
Subotal				$673,000
Contingency @ 25%				$168,000
West Side Total				**$841,000**
Subtotal				$2,420,000
[1]Other Costs @ 25%				$605,000
Alternative #2 Project Cost				**$3,025,000**

Note:
1. Includes development of raw water model, hydrologic modeling for obstructions in streams permit, and water rights permitting.

HAYS, KANSAS
WELL RELOCATION
OPINION OF PROBABLE PROJECT COST

Item	Quantity	Unit	Unit Cost	Cost ($)
ALTERNATIVE #3				
Submersible Pump (with well house)				
East Side				
Well Construction	3	EA	$51,000	$153,000
Well House	3	EA	$58,000	$174,000
500 gpm Pump	3	EA	$11,000	$33,000
Monitoring Well	3	EA	$1,500	$4,500
Transmission	11,400	LF	$48	$547,000
River Crossing	1	LS	na	$44,000
Power Supply	1	LS	$0	$0
Electrical	3	EA	$21,500	$64,500
SCADA (includes WTP Improvements)	4	EA	$15,000	$60,000
Site Work (access roads, backfill)	1	LS	na	$45,000
Demolition (Wells S15 & S17)	2	EA	$4,000	$8,000
Chlorination Facility				
Building	1	EA	$9,000	$9,000
Equipment	1	EA	$46,000	$46,000
SCADA/Instruments	1	EA	$24,000	$24,000
Demolition	1	EA	$3,000	$3,000
Subtotal				$1,215,000
Contingency @ 25%				$304,000
East Side Total				**$1,519,000**
West Side				
Well Construction	3	EA	$51,000	$153,000
Well House	2	EA	$58,000	$116,000
Well S-7 Piping Connect	1	EA	$10,000	$10,000
500 gpm Pump	3	EA	$11,000	$33,000
Monitoring Well	3	EA	$1,500	$4,500
Transmission	2700	LF	$48	$130,000
Power Supply	1	LS	$0	$0
Electrical	3	EA	$21,500	$64,500
SCADA (includes WTP Improvements)	3	EA	$15,000	$45,000
Site Work (access road, backfill)	1	LS	na	$37,000
Demolition	2	EA	$4,100	$8,200
Chlorination Facility (SCADA/Instruments only)	1	EA	$24,000	$24,000
Subtotal				$625,000
Contingency @ 25%				$156,000
West Side Total				**$781,000**
Subtotal				$2,300,000
[1]Other Costs @ 25%				$575,000
Alternative #3 Project Cost				**$2,875,000**

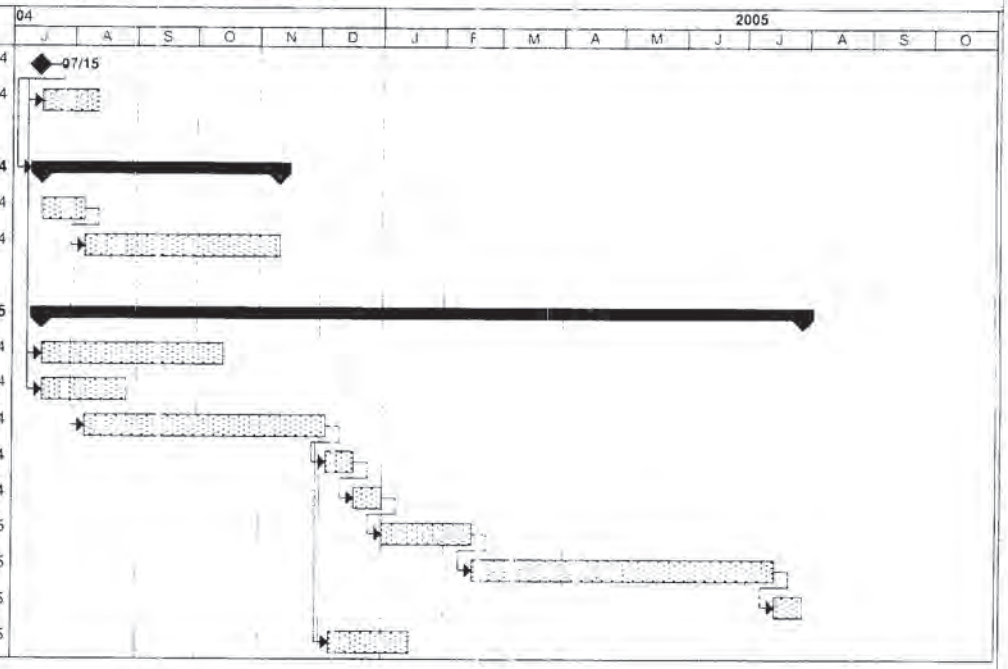
Note:
1. Includes development of raw water model, hydrologic modeling for obstructions in streams permit, and water rights permitting.

Attachment 6

Schedule

City of Hays
Smoky Hill Well Field Improvement Project

ID	Task Name	Duration	Start	Finish
1	Notice to Proceed	1 day	Thu 07/15/04	Thu 07/15/04
2	Finalize Lease or Purchase Agreement (City)	28 edays	Thu 07/15/04	Thu 08/12/04
3				
4	**Water Rights**	**84 days**	**Thu 07/15/04**	**Wed 11/10/04**
5	File Change Application	21 edays	Thu 07/15/04	Thu 08/05/04
6	DWR Review and Approval	97 edays	Thu 08/05/04	Wed 11/10/04
7				
8	**Final Design and Construction**	**270 days**	**Thu 07/15/04**	**Thu 07/28/05**
9	Hydraulic Analysis	90 edays	Thu 07/15/04	Wed 10/13/04
10	Survey	42 edays	Thu 07/15/04	Thu 08/26/04
11	Final Design (Prepare Plans and Specs)	120 edays	Thu 08/05/04	Fri 12/03/04
12	City Review and Comment	14 edays	Fri 12/03/04	Fri 12/17/04
13	State Review and Permit	14 edays	Fri 12/17/04	Fri 12/31/04
14	Bid & Award Project	45 edays	Fri 12/31/04	Mon 02/14/05
15	Construction	150 edays	Mon 02/14/05	Thu 07/14/05
16	Project Start-up	14 edays	Thu 07/14/05	Thu 07/28/05
17	Operation Plan	30 days	Mon 12/06/04	Fri 01/14/05



Burns & McDonnell
SINCE 1898

September 30, 2005

Mr. Joe Obholz, Superintendent
City of Hays
1002 Vine St.
Hays, Kansas 67601

Supplemental Modeling Report
Smoky Hill Well Field Study
BMcD Project Hays 34505

Dear Mr. Obholz:

Presented herewith is our Supplemental Groundwater Modeling letter report on the Smoky Hill River Well Field as requested by the Division of Water Resources to accompany the applications for a change in the point of diversion required for the proposed improvements.

INTRODUCTION

The City of Hays (City) is in the process of upgrading their Smoky Hill River Well Field to reduce interference drawdown between their wells and wells of other water users. The City's well field is located near the town of Schoenchen in southern Ellis County, Kansas. The improvements will increase spacing between wells and allow the City to divert water, to the limit of their existing water rights, with fewer impacts to the aquifer and adjacent users than would be experienced with the current well field configuration. The planned improvements include relocating five existing wells and redrilling one well that is in poor condition.

Several studies have been completed to evaluate the aquifer conditions and appropriately site the relocation of existing wells, and estimate the amount of yield that may be available from the aquifer during drought conditions. The studies include:

A. Well Rehabilitation Work & Well Site Investigation Smoky Hill River Valley Area, 1994-1995, Ground Water Associates, December 30, 1995.

B. Smoky Hill River Well Field Aquifer Geometry, as Determined by Surface Resisitivity Surveys, University of Texas, Dallas, 2002.

C. Final Report: Sustainable Yield from the Smoky Hill River Well Field, Schoenchen, KS, University of Texas, Dallas, November 18, 2002.

D. Draft Interim Report, Smoky Hill Well Field Study, Burns & McDonnell, June 4, 2003.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

Burns & McDonnell
SINCE 1898

E. Preliminary Siting Results for Feasibility Study of Water Supply, Burns & McDonnell, May 7, 2004.

F. Phase II Report, Smoky Hill Well Field Study, Burns & McDonnell, June 15, 2004.

The Hays City Commission approved the planned improvements in July 2004. Subsequently, a siting study was conducted to determine locations for the wells to be moved and applications to change authorized points of diversion were filed with the Department of Agriculture, Division of Water Resources (DWR) on October 7, 2004.

Due to concerns about the Project expressed by other water users, DWR has requested that the City perform additional hydrologic analyses in order to determine the potential impacts to other water users, evaluate impacts to water levels, and estimate the amount of stream depletions in the vicinity of the well field. DWR requested specific groundwater modeling simulations to evaluate differences in magnitude of impacts experienced in the current well field configuration and those estimated for the proposed configuration.

PURPOSE AND SCOPE

The purpose of this report is to describe the development, calibration, application and findings of a groundwater flow model simulation of the City's Smoky Hill Well Field area as requested by DWR.

The scope of the evaluation includes several scenarios to show variations in groundwater levels with differing river flow and well field pumping rates. Model scenarios requested by DWR are listed in a letter to the City dated June 13, 2005 (see Attachment 1).

Modeling for these simulations is based on the groundwater model originally developed by the University of Texas – Dallas (UTD), using the United States Geological Survey (USGS) MODFLOW model. The UTD model was constructed in steady - state mode. For this effort, the model was converted to transient mode which allows the computation of water levels and stream depletion at selected time intervals. Extensive refinement of the UTD model is required to provide the information requested by DWR. Groundwater contour maps, water level hydrographs, and water budgets are used to present the results of each scenario.

Much of the data used to refine the model were collected from previous Smoky Hill Aquifer (alluvial aquifer) investigations performed at the site including, geophysical studies, boring logs, aquifer pumping tests, water level data, and City water usage information. Additional data used for the study were obtained from USGS real-time stream gages and from the Kansas Geological Survey (KGS) water well data base.

Burns & McDonnell
SINCE 1898

GROUNDWATER SURFACE WATER INTERACTION

Based on drilling log information, there are no significant confining layers present in the alluvial aquifer. Figure 1 contains hydrographs of historical water levels and Smoky Hill River flows. As indicated in the graphs, a good connection exists between the aquifer and the river and horizontally between wells.

GROUNDWATER FLOW MODEL

MODFLOW, a three-dimensional, finite difference groundwater flow model, was used to demonstrate expected changes in stream flow and groundwater levels resulting from the City's reconfiguration of the Smoky Hill Well Field. The MODFLOW computer program is a well-documented groundwater flow model developed by the USGS and has undergone extensive testing and verification. MODFLOW results are used by many regulatory agencies as an aid in evaluating groundwater flow systems.

The objective of this evaluation is to estimate and analyze the potential river/groundwater operational impacts in response to the City's proposed well field reconfiguration as compared to the operational impacts experienced within the existing well field.

A. MODEL CONSTRUCTION

Figure 2 illustrates the conceptual model used as a basis for groundwater model construction. Because there are no significant confining units and a good connection exists between the alluvial aquifer and the river, a one-layer model is appropriate for this study.

The model boundary is shown in Figure 3. The model consists of one layer and has 216 rows and 576 columns with a uniform grid spacing of 12.5 meters. This is a refinement of the original UTD model with grid spacing of 100 meters. A "close-up" view of the model grid is presented in Figure 4.

Ground surface elevations used in the model were obtained from USGS digital elevations model (DEM) grids. Initial surface water, groundwater flow, and model boundary conditions are based on USGS steam gage data, City water level and pumping data, USGS topographic maps, test drilling logs, and aquifer pumping tests performed at the site.

B. MODEL BOUNDARY CONDITIONS

Boundary conditions are mathematical representations which approximate flow conditions in a groundwater system. Model boundary conditions include:

1. Constant flux boundaries (wells), used to stimulate pumping wells and groundwater inflow from some areas outside the margins of the modeled

Burns & McDonnell
SINCE 1898

area. The original UTD model included inflow wells to simulate underflow in and out of the model. Some inflow wells were preserved to simulate inflow from the northern terrace deposits.

2. No-flow boundaries, used for areas that do not contribute significant quantities of water to the alluvial aquifer. These represent the bedrock valley walls.

3. General Head boundaries, used to simulate underflow into the model at the upstream edge of the model and underflow out of the downstream edge of the model. General Head boundaries allow variable inflow depending on the adjacent gradient. Higher pumping rates, resulting in lower water levels, results in steeper gradients which increases underflow into the model or reduces flow out of the model area.

4. Stream boundaries, used to simulate the interactions between the river and alluvial aquifer. Boundary conditions are illustrated in Figures 3 and 4.

C. SURFACE AND BEDROCK ELEVATION

A USGS digital elevation model (DEM) file was used for the surface elevation (top of model layer) in the model. Figure 5 illustrates the top of layer elevations used for this modeling study. The depth to bedrock in the study area was estimated using drilling log and location data from all available test borings and water wells in the study area. A depth to bedrock contour map was then prepared using commercially available kriging software. Figure 6 illustrates the depth to bedrock contours for the model area. Subsequently, the bedrock surface was converted to elevation above mean sea level (msl) by subtracting the bedrock contours from the USGS DEM file. The resulting bedrock elevations were then imported into the model to represent the bottom of the model layer.

D. MODEL AQUIFER PARAMETERS

Model aquifer parameters of hydraulic conductivity, river bed conductance, and specific yield were initially estimated using results of aquifer pumping tests and later refined during calibration. Final values in the model are listed in Table 1.

Table 1
Final Model Parameters

Parameter	Layer 1
Specific Yield	0.2
Hydraulic Conductivity (m/day)	40
Hydraulic Conductivity (ft/day)	131
$K_{streambed}$ (ft/day)	65

E. SMOKY HILL RIVER

As requested by DWR, modeling scenarios included evaluation of City usage at a river flow rate of 5 cubic feet per second (cfs) at the USGS gage near Schoenchen, Kansas. In addition, the same City usage scenarios are evaluated with zero flow in the river in order to simulate the potential impacts during extended drought periods.

River gradient for both the water surface and riverbed were determined using surface elevations from USGS topographic maps. These values were adjusted during the model calibration process in order to match the reported data for January 26, 2005 as closely as possible.

F. RECHARGE

Recharge is not included in the model runs. For scenarios with no river flow representing drought conditions, recharge would be non-existent or very small. For modeling scenarios with river flow, the assumption of no recharge from precipitation is conservative when considering impacts to other wells.

USGS estimated potential recharge is about 1 inch per year in the area of Hays well field; however, recharge may be slightly greater in the river flood plain. There is less than 1800 flood plain acres in the model area. One inch of recharge per year in the active model area would yield less than 150 acre feet of water.

G. MODEL CALIBRATION

As a first step in calibrating the model to reported data, the flow in the Smoky Hill River was set at 6.2 cfs which represents the reported flow rate at the USGS gage near Schoenchen for January 26, 2005. In addition, water levels collected by the City on this date were used to calibrate aquifer water levels. This included two pumping wells (S-7 and S-12). Due to well inefficiency and the size of the

Burns & McDonnell
SINCE 1898

model cells representing the pumping wells, the modeled drawdown for the pumping wells will typically be less than reported values. However, modeled water levels for monitoring wells and non-pumping wells located near the pumping wells will match reported values more closely at the completion of the calibration process.

River flow enters the model via the first stream cell located at the far western edge of the modeled area (see Figure 3). River gradient for both the water surface and riverbed were determined using surface elevations from USGS topographic maps. These values were adjusted during the model calibration process in order to match the reported data for January 26, 2005 as closely as possible.

Calibration statistics are presented in Table 2. These statistics are used as an indicator of model calibration. Large values of residual mean and sum of squared residuals indicate a poor calibration while smaller values indicate a good calibration to reported data. After running the parameter estimation program, the final sum of squared residuals for the model is 45 and the residual mean is -0.62.

The cumulative volume discrepancy (CVD) of the water budget is another measure of calibration quality. A model is generally considered acceptable if there is less than 1 percent discrepancy. For all modeling runs performed for this study, the CVD is less than 1 percent.

Burns & McDonnell
SINCE 1898

Table 2
Calibration Statistics for January 26, 2005

Name	Observed	Computed	Residual
S-06	1,899.50	1,903.75	-4.25
S-07	1,891.07	1,898.36	-7.29
S-08	1,905.24	1,905.43	-0.18
S-10	1,901.04	1,901.55	-0.51
S-11	1,900.78	1,897.97	2.81
S-12	1,887.59	1,888.25	-0.66
S-13	1,891.50	1,895.92	-4.42
S-14	1,895.37	1,894.00	1.37
S-15	1,894.88	1,895.08	-0.21
S-16	1,888.71	1,890.80	-2.09
S-17	1,892.78	1,889.41	3.37
S-18	1,908.07	1,902.80	5.27
T-11	1,900.68	1,902.29	-1.61
T-13	1,893.14	1,894.62	-1.48
T-17	1,889.86	1,889.20	0.66

Residual Mean	0.616122585
Res. Std. Dev.	3.101440713
Sum of Squares	45.71108558
Abs. Res. Mean	2.410996916
Min. Residual	-7.29438482
Max. Residual	5.265092882
Range	20.47344
Std/Range	0.497025566

H. MODEL SENSITIVITY

Model sensitivity analysis is the process of identifying model parameters that have the greatest effect on model results and/or model prediction. During calibration, it was noted that the model is sensitive to changes in aquifer hydraulic conductivity and to changes in hydraulic conductivity of the streambed. The sensitivity analysis was performed by varying individual parameters by multiplication factors of 1.5 and 0.5 times the calibrated model values. The resulting simulated groundwater elevations were then compared to the final calibrated elevations. The analysis showed that the most sensitive parameter is

Burns & McDonnell
SINCE 1898

the hydraulic conductivity. Similar changes in river bed conductance and specific yield do not significantly impact the modeled water levels. A graph of the sensitivity analysis results is presented in Figure 7.

I. MODELING SCENARIOS

A base steady-state modeling run and 28 transient modeling scenarios were performed to simulate potential impacts of the City's proposed well field upgrade on groundwater levels and impacts to the river. An initial steady-state modeling run with the Smoky Hill River set at January 26, 2005 conditions, 6.2 cfs, and no City pumpage was performed to provide initial water levels for the transient model.

Subsequently, twenty eight 365-day transient modeling runs, with river flows of 5 cfs and 0 cfs, were performed to the potential impacts to water levels and river depletions in the vicinity of the well field. The following table lists the proposed City usage and Smoky Hill River flows used in each model scenario.

Table 3 - Model Scenarios

Scenario 1 - Assume **5 cfs** in river *Scenario 1 subsets* 1a-1 Current configuration pumping 1000 AFY 1a-2 Proposed configuration pumping 1000 AFY 1b-1 Current configuration pumping 1500 AFY 1b-2 Proposed configuration pumping 1500 AFY 1c-1 Current configuration pumping 2000 AFY 1c-2 Proposed configuration pumping 2000 AFY 1d-1 Current configuration pumping 2285 AFY 1d-2 Proposed configuration pumping 2285 AFY 1e-1 Current configuration pumping 2800 AFY 1e-2 Proposed configuration pumping 2800 AFY	
Scenario 2	Assume **5 cfs** in river Same as above for proposed configuration Assume maximum allowable pumping from new wells
Scenario 3	Same as Scenario 1 – assume **no flow** in river
Scenario 4	Same as Scenario 2 – assume **no flow** in river

Burns & McDonnell
SINCE 1898

In addition to the model runs requested by DWR, runs of 2800 AF/year under the 5cfs and the zero flow scenarios were completed at the request of the City. These runs were completed to illustrate the operational impacts associated with the original water right quantity prior to reduction by regulatory action.

J. PUMPING DISTRIBUTION

Well pumping times and rates were established to simulate historic patterns of well usage and well rotation. The model was set up to simulate one year of operation with 365 stress periods each representing one day. Within a stress period (day) individual wells can be either off or on for the entire stress period. To simulate the current well field configuration, wells were set to current pumping rates that are listed in Table 4.

Table 4
Current Well Pumping Capacity

Well	GPM
S-8	275
S-7	340
S-6	260
S-18	365
S-10	340
S-11	370

Well	GPM
S-12	370
S-13	360
S-15	320
S-14	270
S-16	260
S-17	250

Pumping was distributed between wells that are not adjacent, as is practiced by the City's Water Plant operators. The number of well operating at one time depended on the average daily quantity need to pump the annual quantity. Initially for the 1000 AFY simulation, wells were pumped a maximum of three days and then turned off and allowed to recover. At the higher annual quantities, more wells were assumed to be operating and were run for longer periods of time.

For the proposed well field configuration, wells will have a design pumping rate of 300 gpm and are simulated in the mode at that rate. The number of wells operating depended on the average daily quantity needed to pump the annual quantity being simulated.

For Scenarios 2 and 4, pumping was concentrated with the new wells to evaluate the potential impacts if the new wells were assumed to be the most efficient and best producers. Well S-16 and S-17 have annual limits of about 300 AFY which

Burns & McDonnell
SINCE 1898

was considered in the modeling efforts. At the higher annual quantities, older wells were brought on line to help provide the water needed.

At higher pumping rates in scenarios with no river flow, some of the model cells went dry, especially with the current configuration. Where this happened, the model subset was rerun with MODFLOW set to allow rewetting of the dry cells. When a cell went dry, pumping from the cell is automatically terminated until water levels in the cells are assumed to have been recovered and the pump restarted. These conditions will result in less water being pumped than originally specified in the pumping schedule. Additionally, in two of the highest pumping runs, where a significant amount of dry cells developed, pumping was reduced and distributed among all wells.

Tables with scenario pumping distributions are presented in Attachment 1.

MODEL RESULTS

This section discusses the results of each modeling scenario and presents graphs and maps to illustrate the modeled water level changes in the alluvial aquifer in the vicinity of the City's well field. As requested by DWR, water level contour maps after 60, 120,180, and 365 days, water level hydrographs, and river water budgets for a 1-year modeling period are presented for each scenario.

Hydrographs at simulated monitoring points and groundwater contour maps for each scenario are presented in a separate "Groundwater Modeling Attachment" volume. Locations of the simulated monitoring points are shown in Figure 8. These locations were chosen to estimate impacts of the various pumping and river conditions throughout the modeled portion aquifer. Each scenario contains model hydrographs for the USGS Monitoring Wells T-11, T-13, and T-17 and at monitoring points requested by DWR.

A. WATER BUDGETS

Water budgets were recorded for each of the model runs at 60, 120, 180 and 365 days of simulated well field operation. Run summaries are presented in Attachment 2 and the net annual amount of water derived from each source is shown in Tables 5.

Scenario 1 - Smoky Hill River flowing at 5 cfs.

In Scenario 1 and 2, water is shown being removed from aquifer storage and from underflow, even though there is flow in the river. The reason is that the initial water table was determined for conditions on January 26, 2005, a date that there was flow at both the upper and lower USGS gages. When pumps are first turned on at other location, the water table is drawn down in response to the pumping and water is removed from storage. When the well is turned off, the water table

Burns & McDonnell
SINCE 1898

rises and water returns to storage. At higher pumping rates, more water is removed from storage and obtained from underflow as the water table is lowered in response to the pumping.

The table shows that depletions from the river are practically identical (within 0.6 percent of each other) for both the current and proposed configurations.

Table 5
Water Budget Summary for Current and Proposed Well Field
(acre feet per year)

Annual Quantity	Current Configuration					
	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	55.7	389.2	562.4	1006.9	999.5	7.8
1500 AF	83.9	392.4	1029.7	1506.3	1499.7	6.3
2000 AF	117.8	395.7	1491.7	2005.5	1998.7	6.5
2285 AF	134.6	397.7	1757.3	2289.3	2283.5	6.1
2800 AF	170.3	401.4	2232.7	2804.7	2798.5	5.9

Annual Quantity	Proposed Configuration					
	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	59.8	389.4	558.6	1007.8	999.5	8.3
1500 AF	92.1	392.6	1022.4	1506.7	1499.7	7.4
2000 AF	121.6	396.1	1488.7	2006.7	1998.7	7.7
2285 AF	147.3	398.0	1745.0	2290.3	2283.5	6.8
2800 AF	186.1	401.8	2216.4	2804.3	2798.5	5.8

Scenario 2 - River 5 cfs - New Wells used to Maximum

Annual Quantity	Proposed Configuration					
	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	62.7	389.6	553.6	1006.3	999.6	6.3
1500 AF	100.2	393.1	1011.6	1505.3	1499.4	5.5
2000 AF	144.1	396.7	1464.1	2004.8	1999.2	5.7
2285 AF	162.9	398.9	1729.1	2290.8	2284.3	6.6

Burns & McDonnell
SINCE 1898

Scenario 3 - No Flow in River

Annual Quantity	Current Configuration					
	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	790.0	205.7	0	995.7	987.0	8.7
1500 AF	1207.9	211.5	0	1419.4	1411.1	8.3
2000 AF	1790.1	218.9	0	2009.0	2000.6	8.4
2285 AF	2013.1	223.5	0	2236.6	2228.2	8.4
2800 AF	1923.2	227.8	0	2151.0	2142.9	8.1

Annual Quantity	Proposed Configuration					
	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	759.2	245.5	0	1004.7	999.5	5.2
1500 AF	1141.5	365.7	0	1507.2	1497.6	9.6
2000 AF	1707.9	301.6	0	2009.5	2000.6	8.9
2285 AF	1974.2	318.0	0	2292.2	2283.2	9.0
2800 AF	2147.6	304.5	0	2452.1	2443.4	8.7

Scenario 4 - No Flow in River - New Wells used to maximum

Annual Quantity	Proposed Configuration					
	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	717.8	290.8	0	1008.6	1000.0	9.0
1500 AF	1228.9	263.3	0	1492.2	1480.0	8.2
2000 AF	1576.7	421.3	0	1998.0	1988.0	9.5
2285 AF	1386.7	434.7	0	1821.4	1811.0	10.0

B. HYDROGRAPHS OF THE SIMULATED MONITORING WELLS

The modeling software allows calculation of simulated water levels at specified location in the model area. These locations are called targets or simulated monitoring wells. Twelve simulated monitoring points were placed in the model and hydrographs were developed for each modeling run. Additionally, the hydrographs are combined in two ways to help evaluate the impacts of the well field improvements and to show the impacts in the well field with and without river flow. The locations of the simulated modeling points are shown on the water level contour maps and are briefly discussed in the following section.

Monitoring Points 1 and 2 are upstream of the existing well field and indicate expected impacts of expansion in that area. Monitoring Points 3 through 10 are in the central part of the well field and will show expected impacts north of the river

Burns & McDonnell
SINCE 1898

and through Schoenchen. Monitoring Points 11 and 12 are at the eastern end of the proposed configuration and show the expected impacts to this area.

1. Scenarios with River Flow
All monitoring points show no discernable differences for all pumping scenarios with 5 cfs flow in the Smoky Hill River even at annual pumping quantities up to the original water right total of 2800 AFY. These hydrographs are included in Attachment 3.

2. Scenarios with No River Flow
Scenarios simulating pumping when there is no flow in the Smoky Hill River show varied impacts to groundwater levels at the monitoring points. Generally there was less drawdown at monitoring points with the proposed relocation of wells, with a few exceptions.

Monitoring Points 1 and 2, in the upstream area that previously had not been in the area of influence of pumping, showed small amounts of drawdown. The maximum was about 6 feet at MP2 after one year pumping at a rate of 2285 AFY with no flow in the river.

Monitoring Point 3 through 10 shows significantly less impact to groundwater levels with the proposed relocation of the wells at pumping rates up to 2285 AFY. Scenario 4, with pumping concentrated in the new wells also shows marked reduction in impacts because of less use of the older well that are close to Schoenchen. There is some to slight improvement of these monitoring points at pumping rates of 2800 AFY.

Monitoring Points 11 and 12, at the eastern end of the well field show very minor impacts, less than 2 feet, to groundwater levels, even at pumping rates up to 2800 AFY.

3. Water Level Contour Maps
Water level contour maps for all of the scenarios are included in the separate volume of groundwater modeling attachments. The contour interval is 2 feet. In the scenarios with flow in the Smoky Hill River, there are no significant differences in the water level contour lines. At higher pumping rates, contours around the pumping wells are slightly more pronounced.

In the scenarios with no flow in the Smoky Hill River, changes in the water level contours can be noted through time (60, 120, 180 and 365 days) and as the pumping rates are increased. The simulations show some areas (model cells) becoming dewatered at the higher pumping rates near the valley walls. Modeling construction includes assumptions that the

Burns & McDonnell
SINCE 1898

bedrock elevation increases near the edges of the river floodplain which results in less saturated thickness in these locations. Relatively small declines in the water table can make these areas appear to go dry. Actual conditions may vary from the model assumptions.

CONCLUSIONS

The water budgets from modeling show that the impact to the Smoky Hill River is not increased with the City's proposed well field redevelopment plan. The model shows that the amount of water originating from the river is practically identical with the current and proposed well field configurations.

During times of river flow, there is no significant difference to the simulated monitoring wells for any of the pumping scenarios, including the proposed configuration and maximum pumping from the new wells.

During times of no river flow, modeling of the current well field shows greater amounts of drawdown in the central reach of the river as compared to the proposed well field configuration that has greater spacing between wells that reduces the amount of interference drawdown.

Pumping the maximum amount from the new wells significantly reduced impacts to simulated monitoring well in the central reach of the river. This is because the older wells, in the central reach are pumped less, resulting in less impacts to local areas.

Modeling of the expanded well field shows minor amounts of drawdown at simulated monitoring wells in the upstream and downstream reaches of the proposed well field configuration (less than 4 feet at MP2 with no river flow for one year and pumping 2285 AFY and less than 2 feet at downstream simulated monitoring wells MP11 and MP12).

Burns & McDonnell is pleased to be of service to the City of Hays. The assistance provided by the staff of the City of Hays during the course of this study is greatly appreciated. The project team remains ready to discuss the details of this report at your convenience.

Sincerely,

Brian Meier Project Manager	David Stous, P.G., P.E. Hydrogeologist	Robert Jaques, R.G. Hydrogeologist

City of Hays, Kansas
Groundwater Modeling for Water Right Change Requests
Letter Report
HAYS 24505

INDEX AND CERTIFICATION SHEET

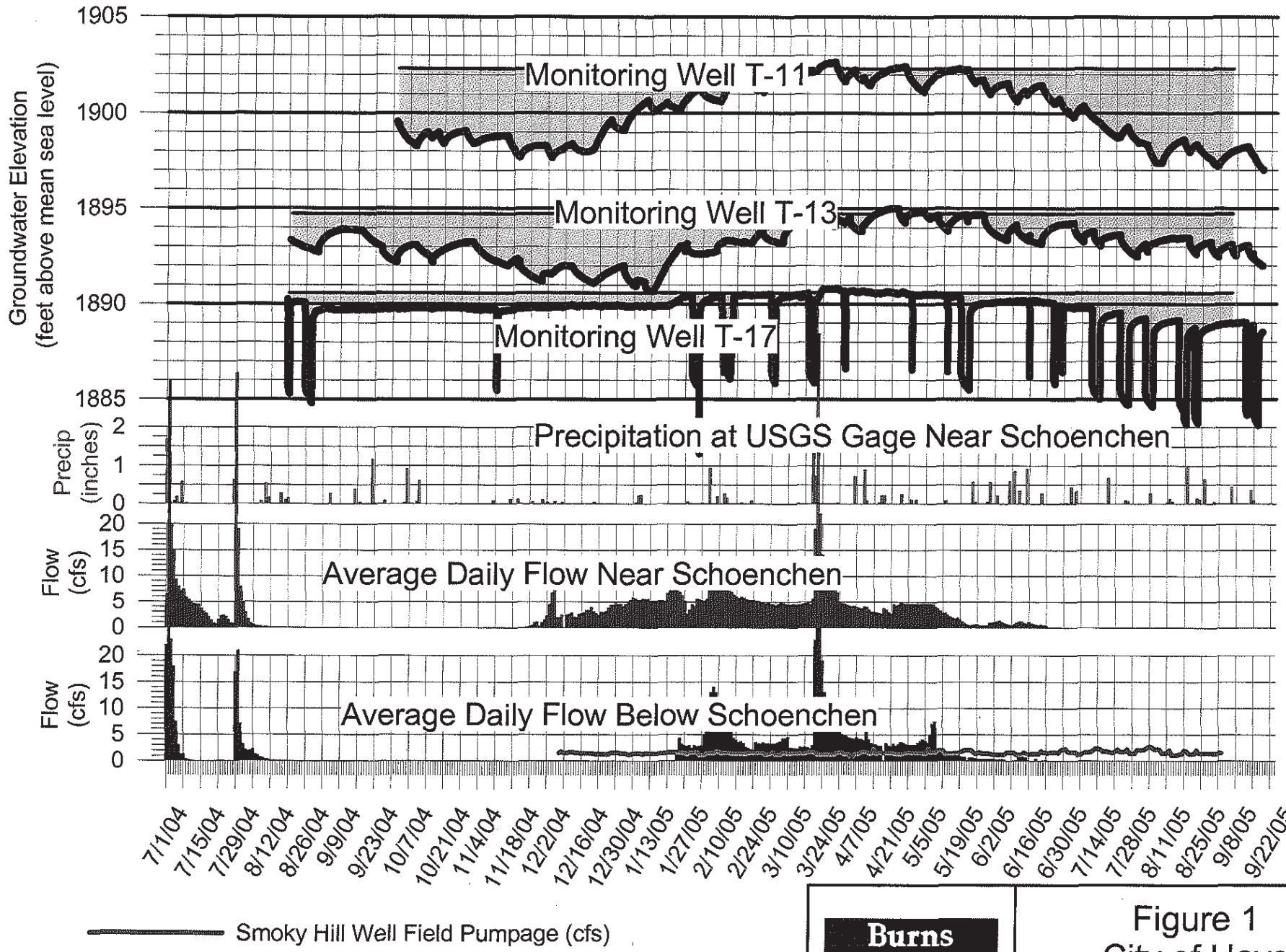
PART	PART TITLE	NUMBER OF PAGES
	Letter Report	14
	Figures	8
	Attachments	4

CERTIFICATION

ROBERT C. JAQUES
LICENSED
580
KANSAS
GEOLOGIST

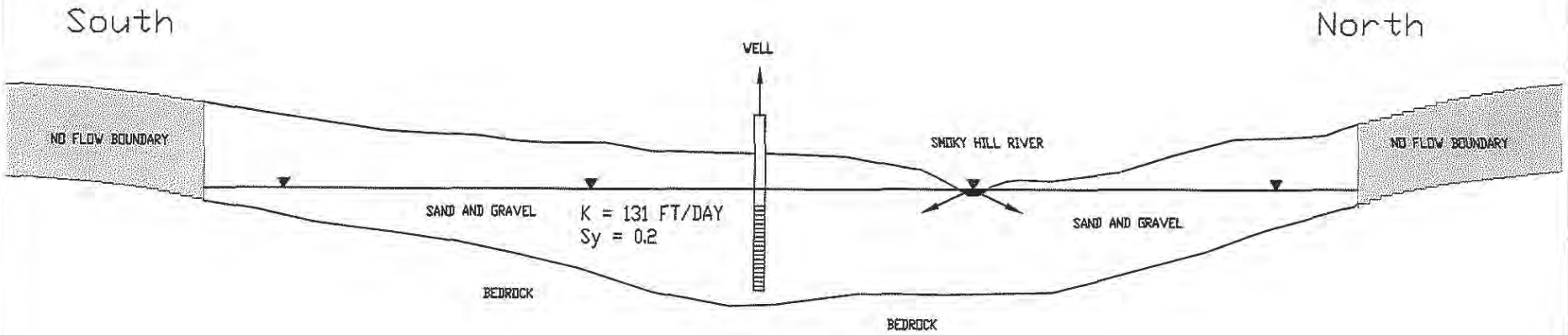
10-3-05

FIGURES



Burns & McDonnell

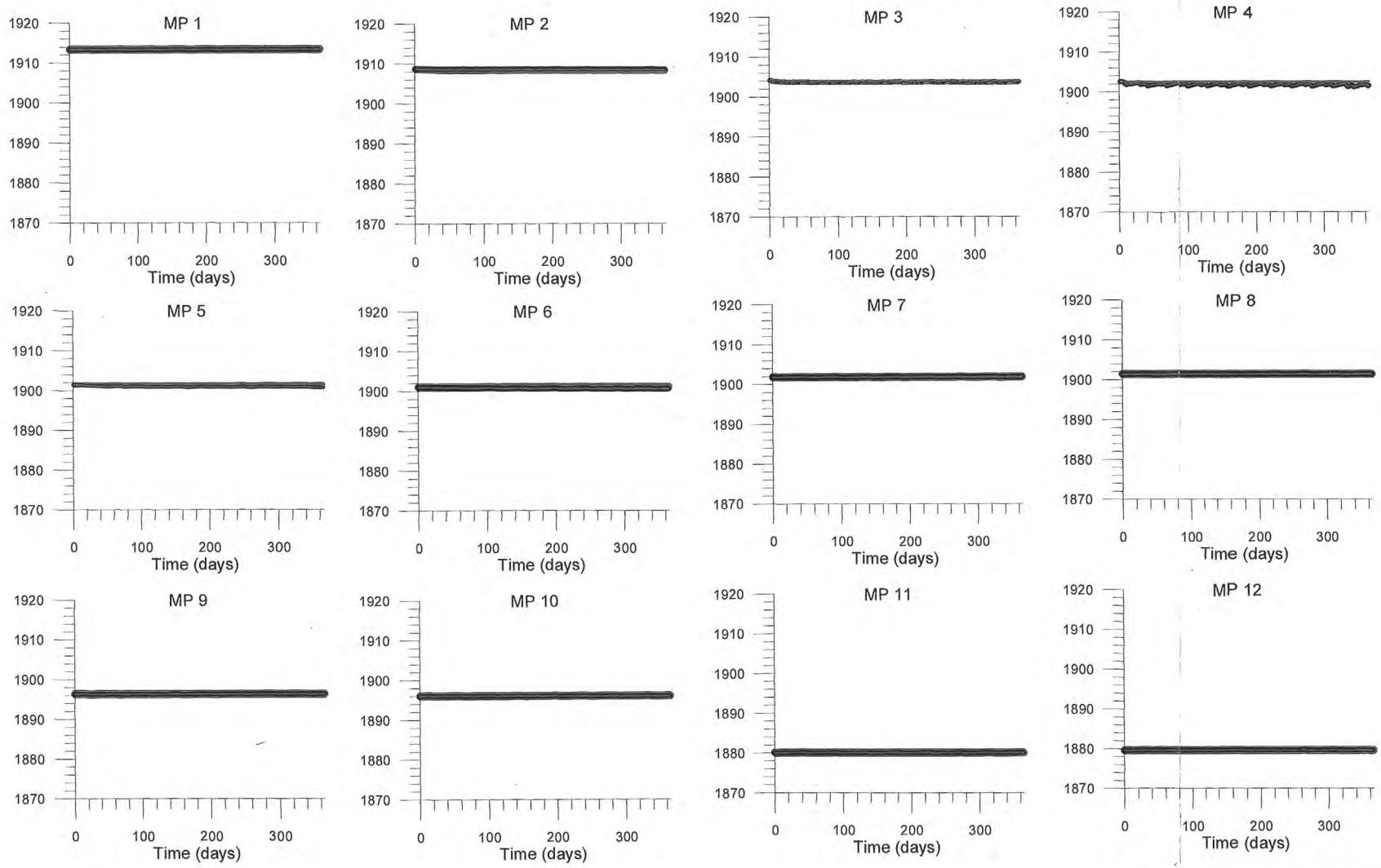
Figure 1
City of Hays
Smoky Hill Well Field
Monitoring Wells



Burns & McDonnell
SINCE 1898

Figure 2
CONCEPTUAL MODEL

XSEC.DWG 9-12-05



LEGEND

Current Configuration

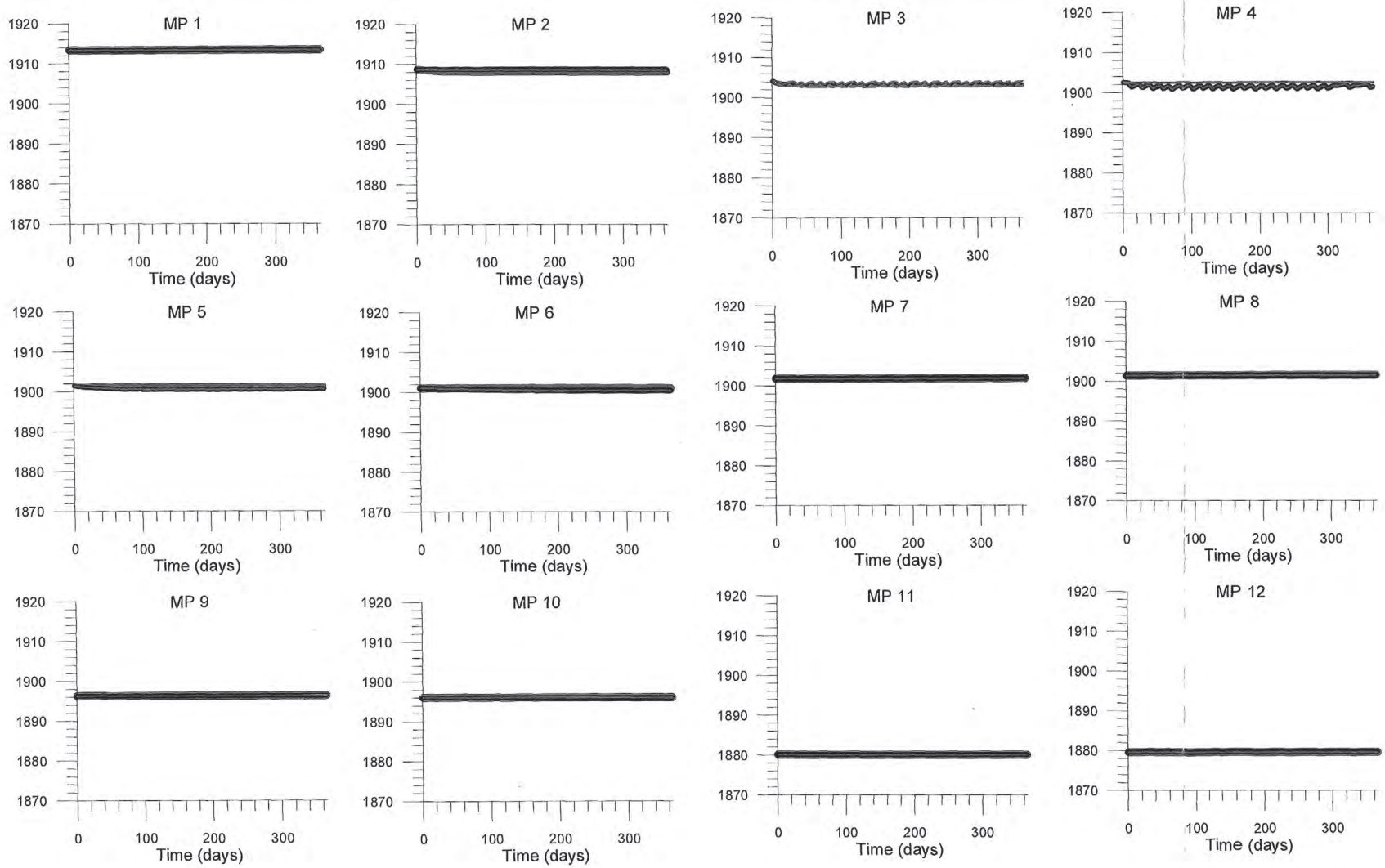
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

1000af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
1000 ACRE-FEET
WITH 5 cfs FLOW IN RIVER



LEGEND

Current Configuration

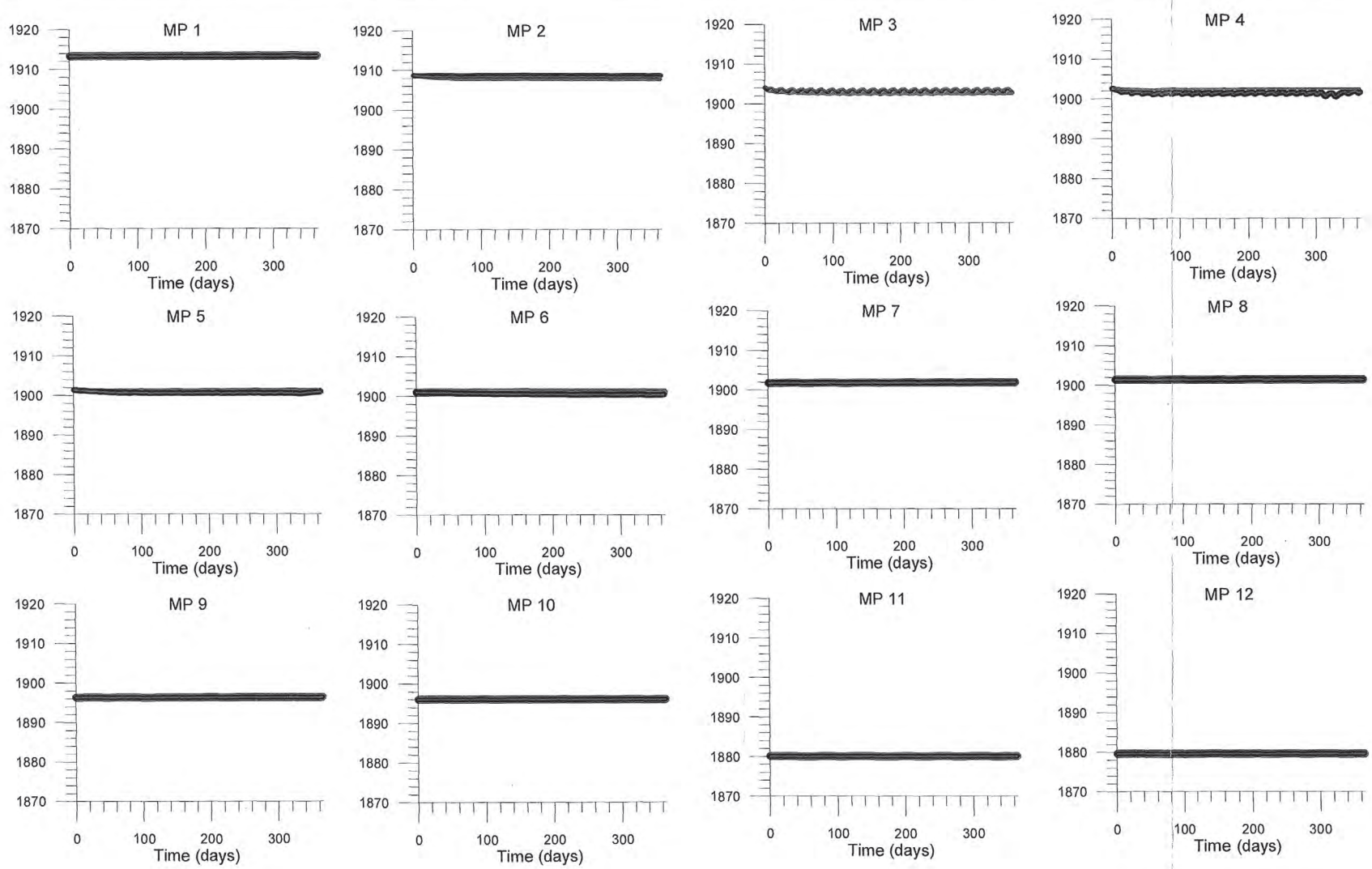
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

1500af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
1500 ACRE-FEET
WITH 5 cfs FLOW IN RIVER



LEGEND

Current Configuration

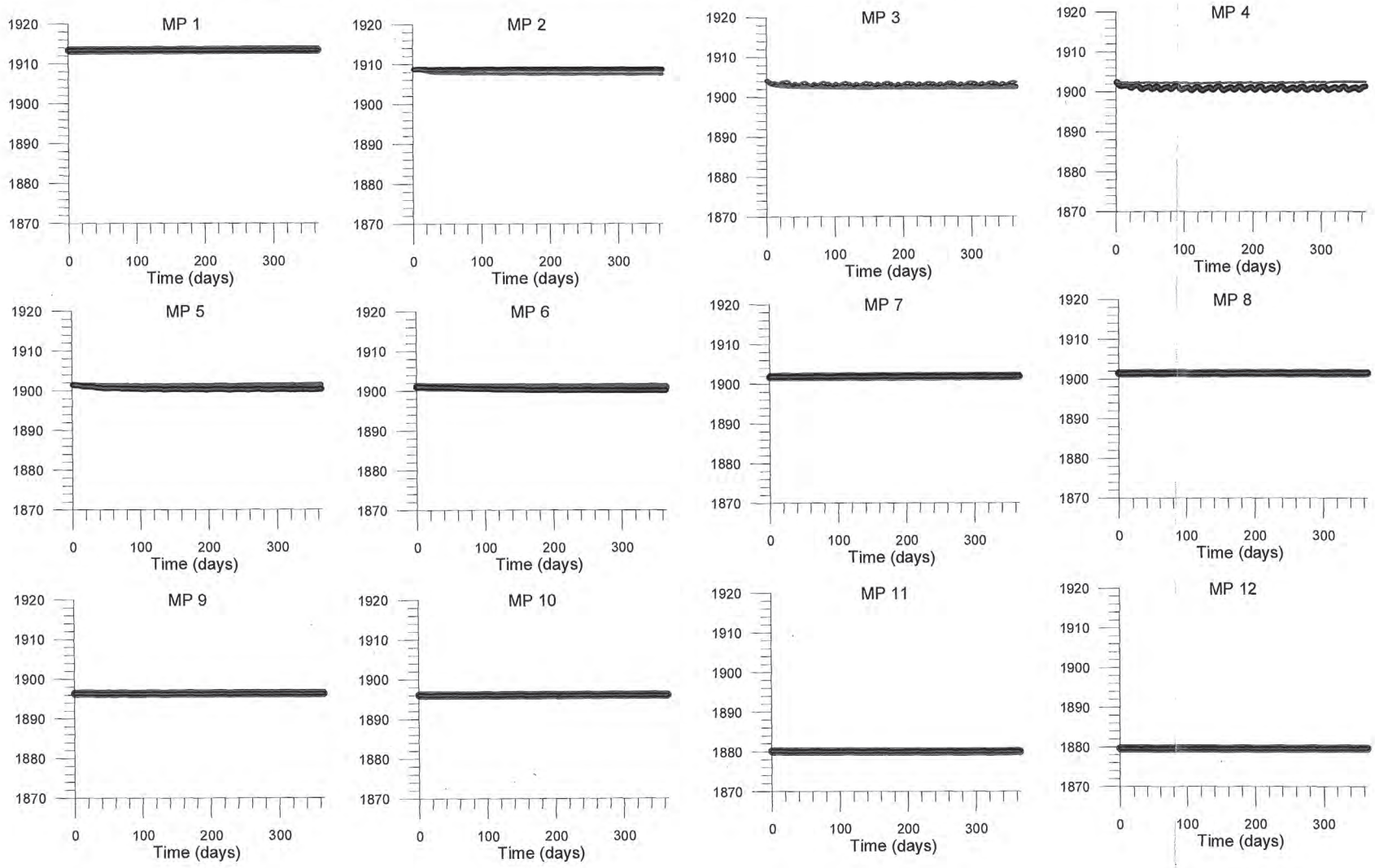
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

2000af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
2000 ACRE-FEET
WITH 5 cfs FLOW IN RIVER



LEGEND

Current Configuration

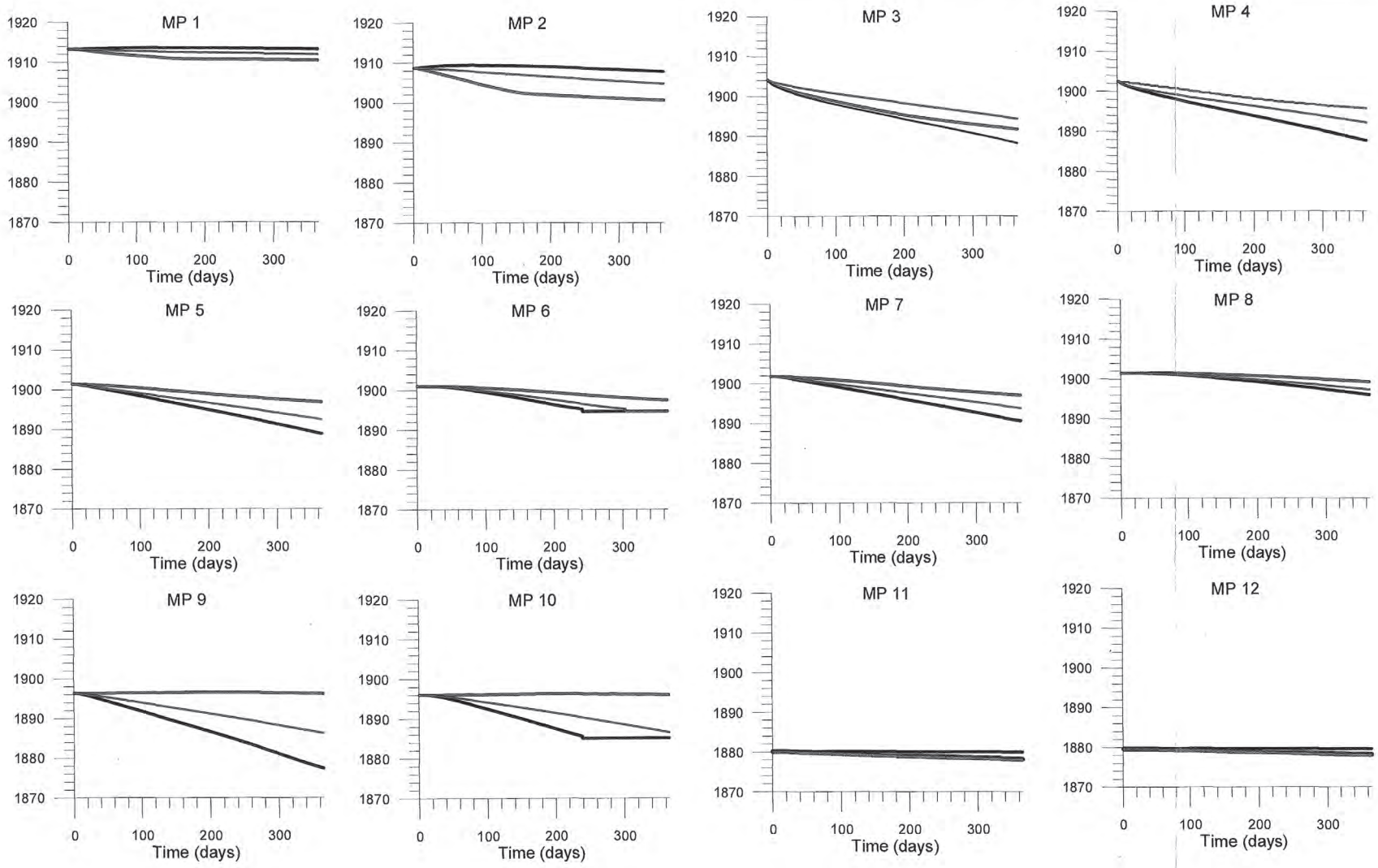
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

2285af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
2285 ACRE-FEET
WITH 5 cfs FLOW IN RIVER



LEGEND

Current Configuration

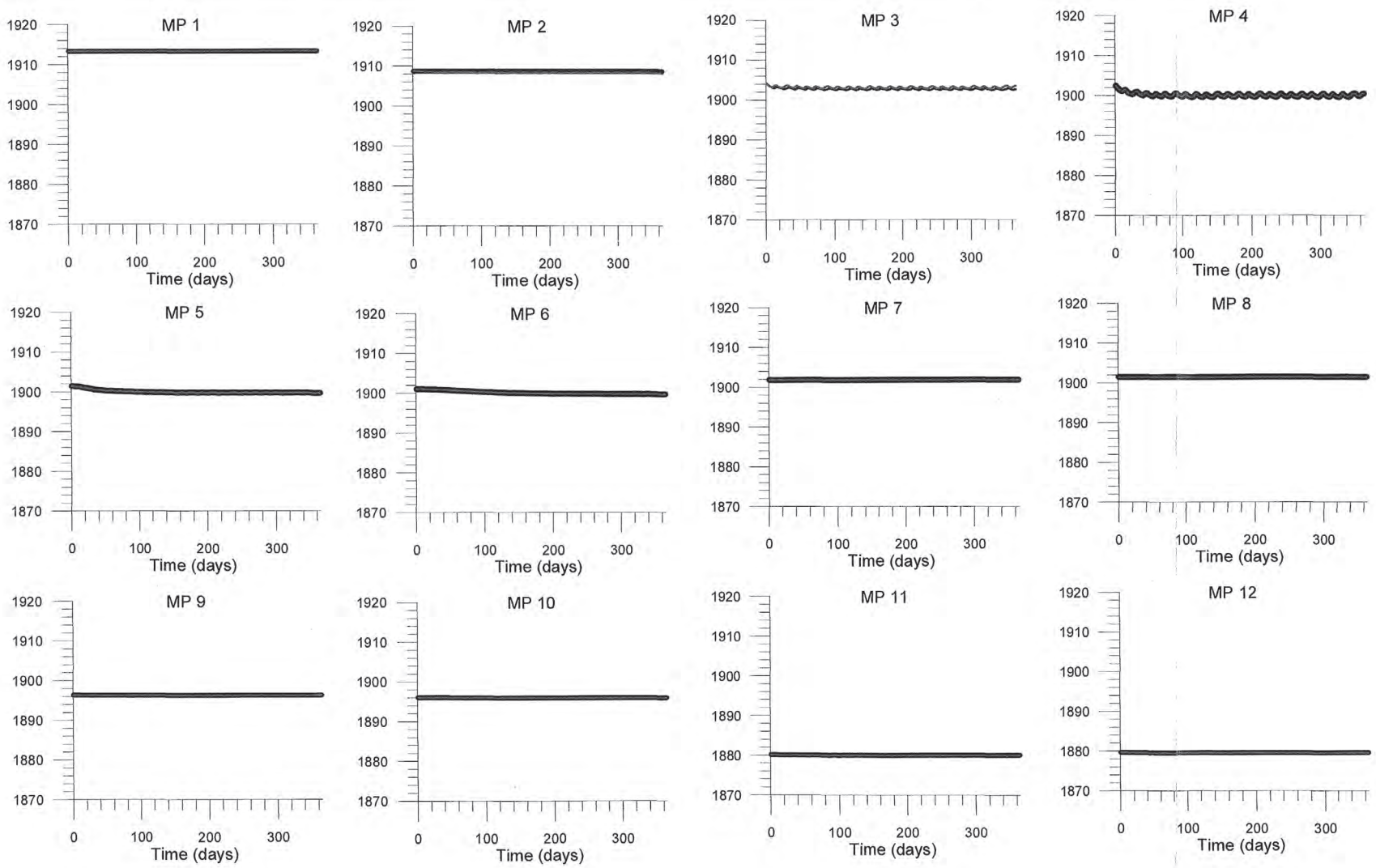
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

2285af0cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
2285 ACRE-FEET
WITH NO FLOW IN RIVER



LEGEND

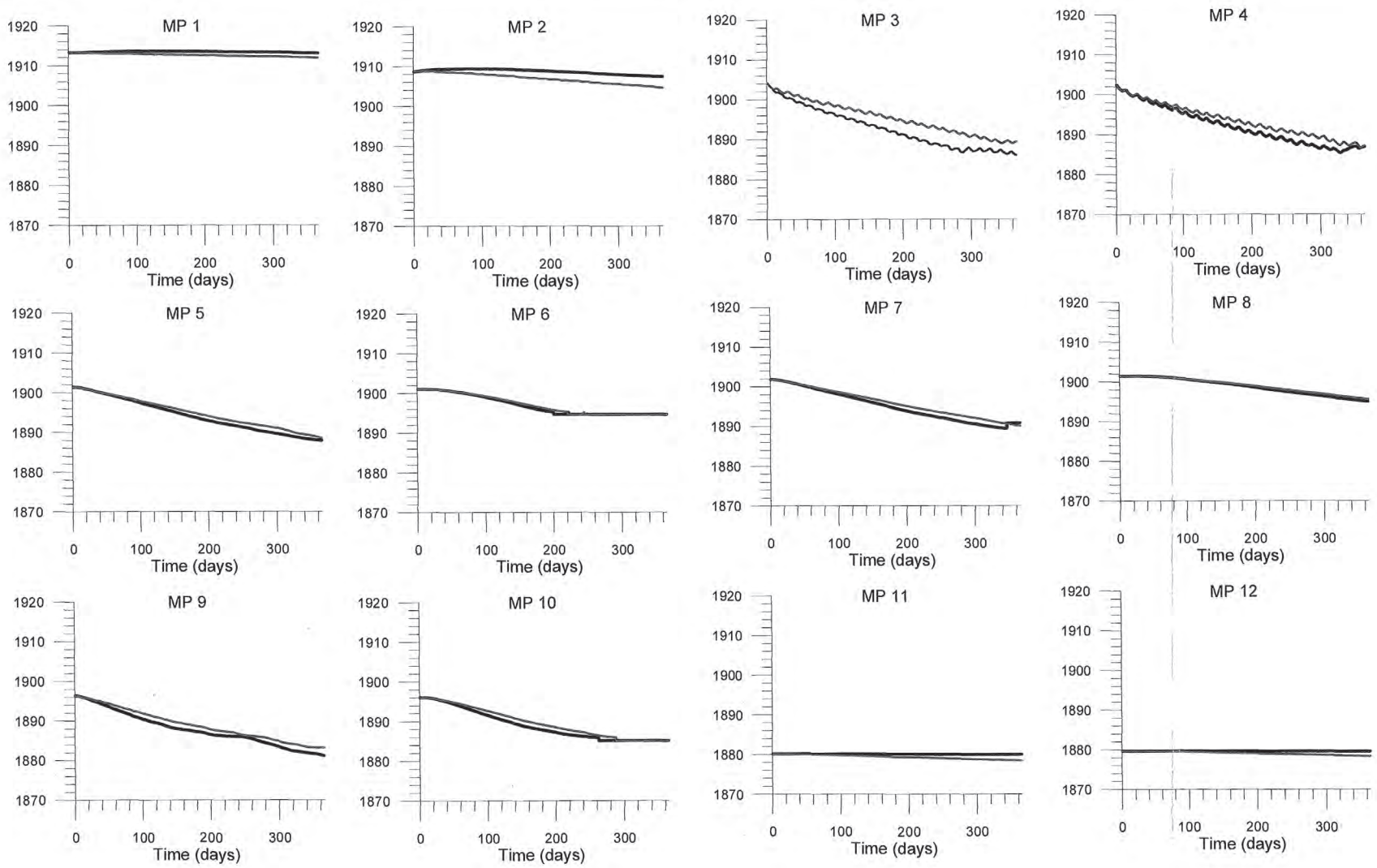
Current Configuration

Proposed Configuration

Burns & McDonnell
SINCE 1898

TARGET HYDROGRAPHS
2800 ACRE-FEET
WITH 5 cfs FLOW IN RIVER

2800af5cfs.grf 9/14/05



LEGEND

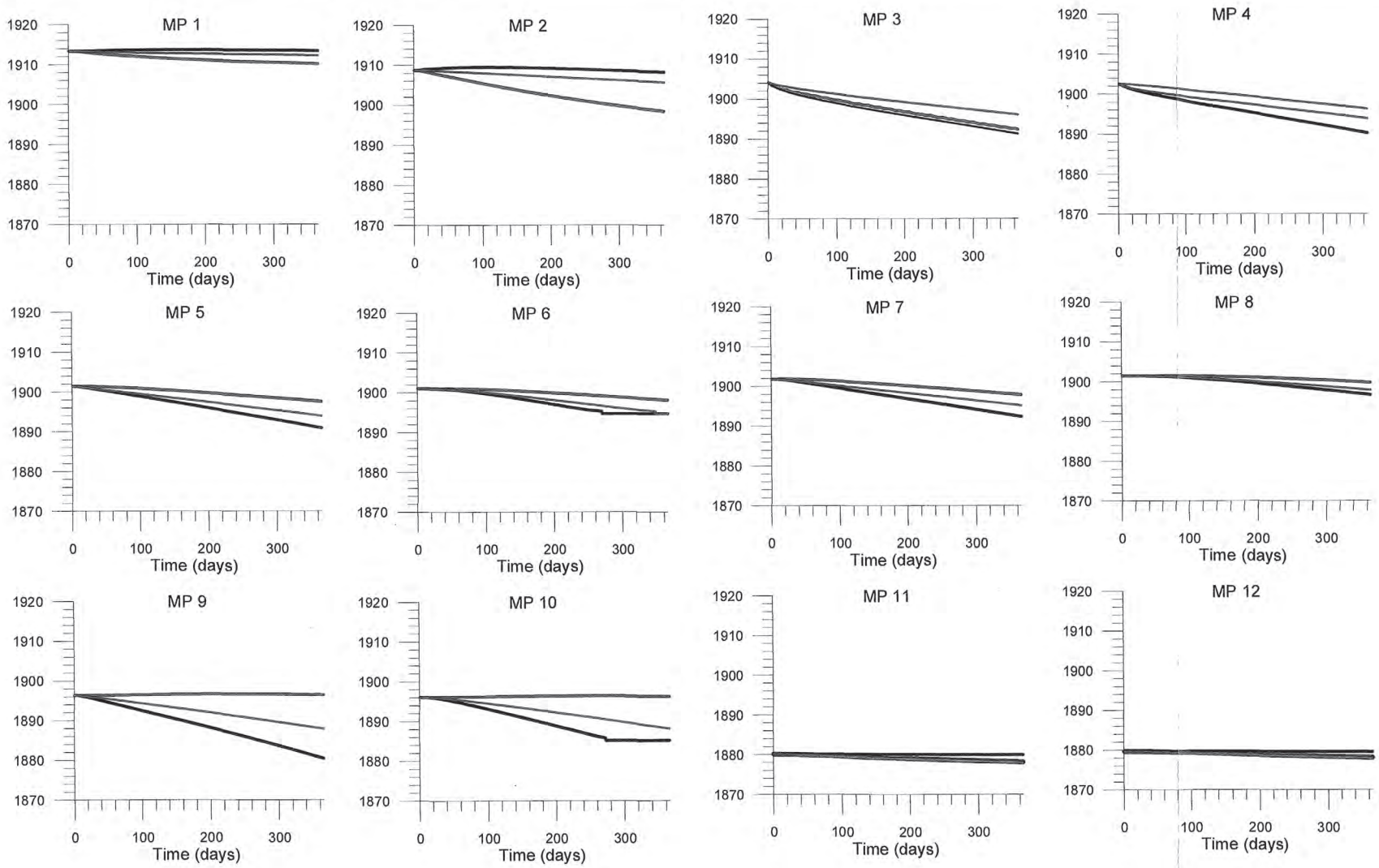
Current Configuration

Proposed Configuration

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
2800 ACRE-FEET
WITH NO FLOW IN RIVER

2285af0cfs.grf 9/14/05



LEGEND

Current Configuration

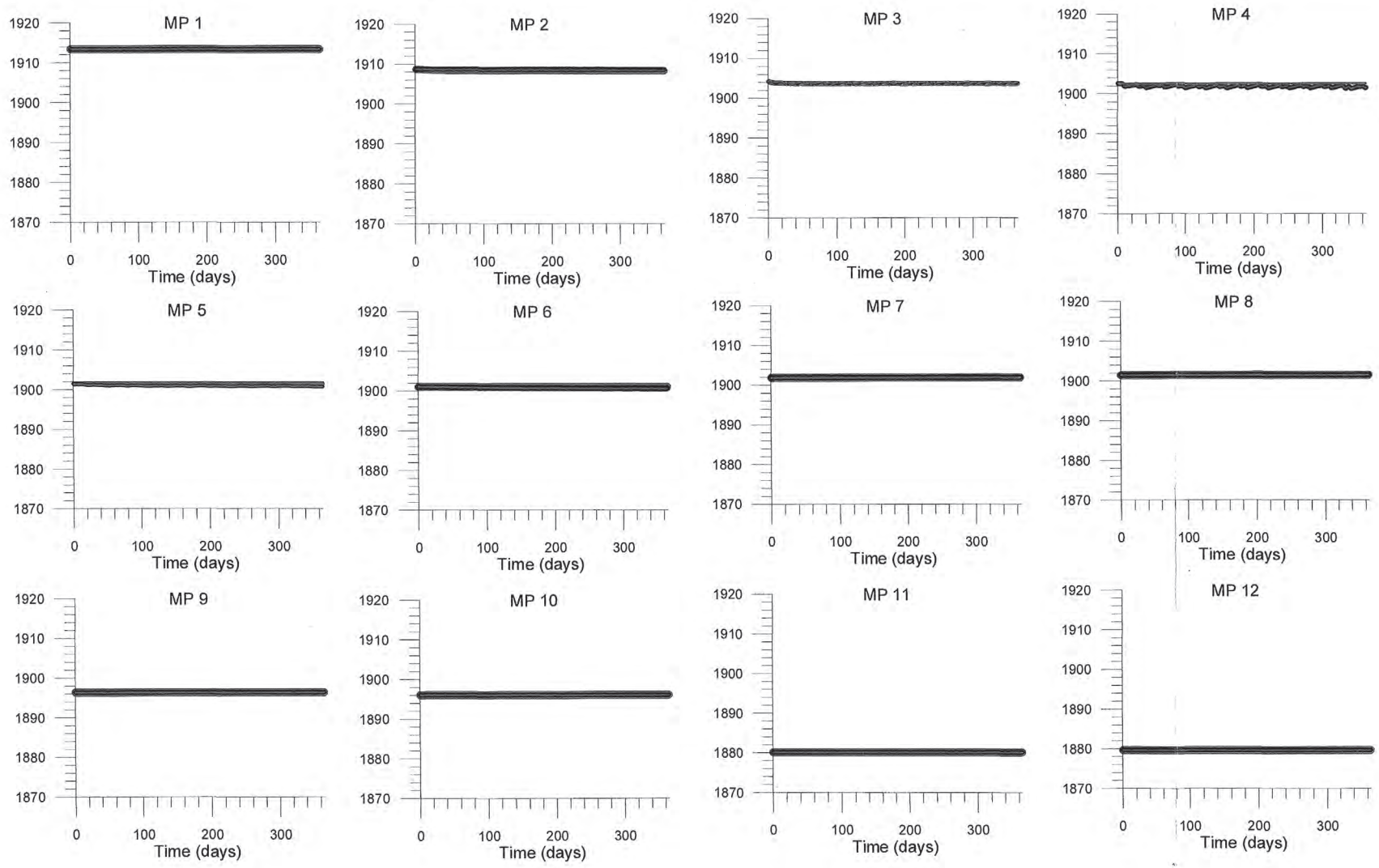
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

2000af0cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
2000 ACRE-FEET
WITH NO FLOW IN RIVER



LEGEND

Current Configuration

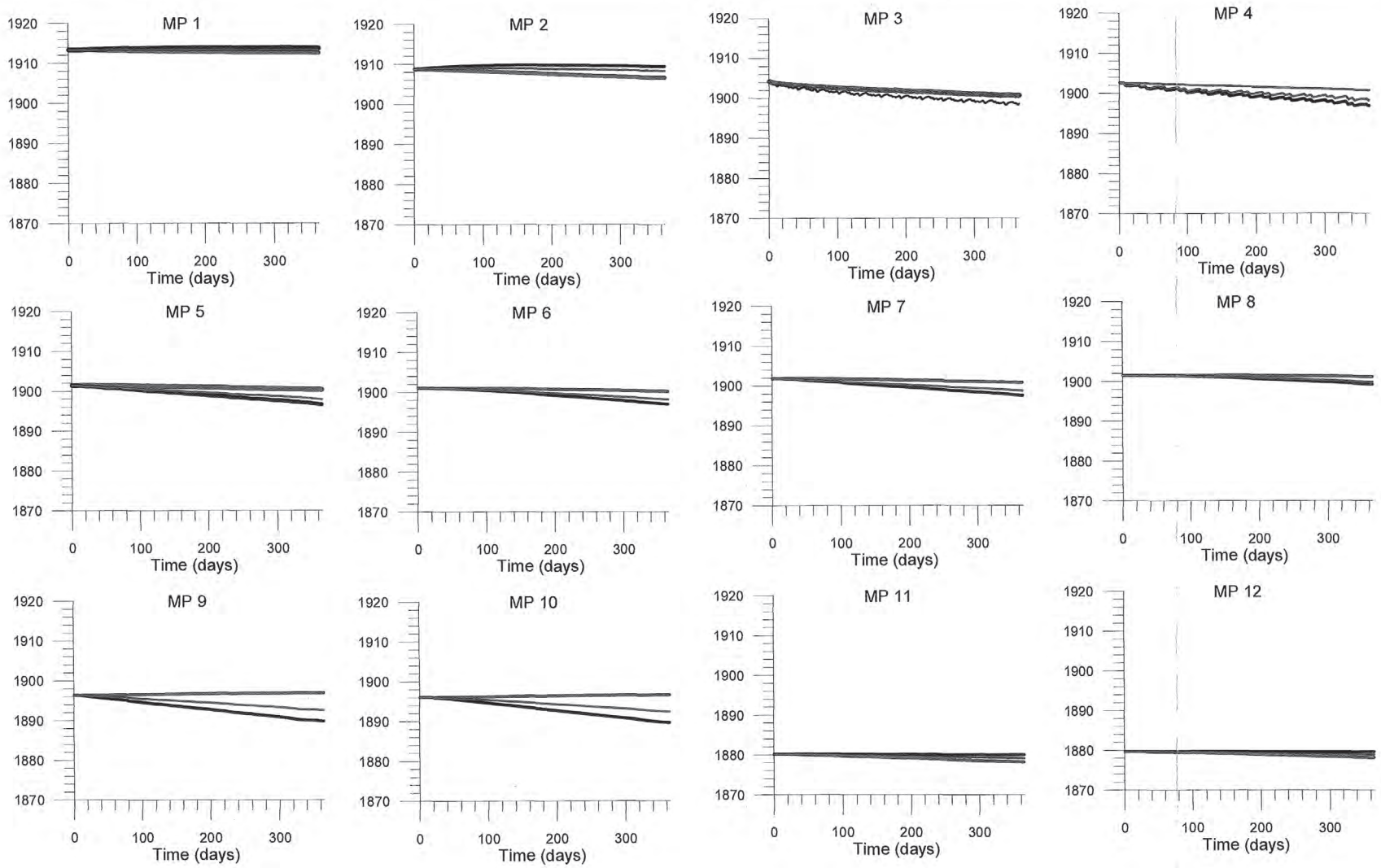
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

1000af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
1000 ACRE-FEET
WITH 5 cfs FLOW IN RIVER



LEGEND

Current Configuration

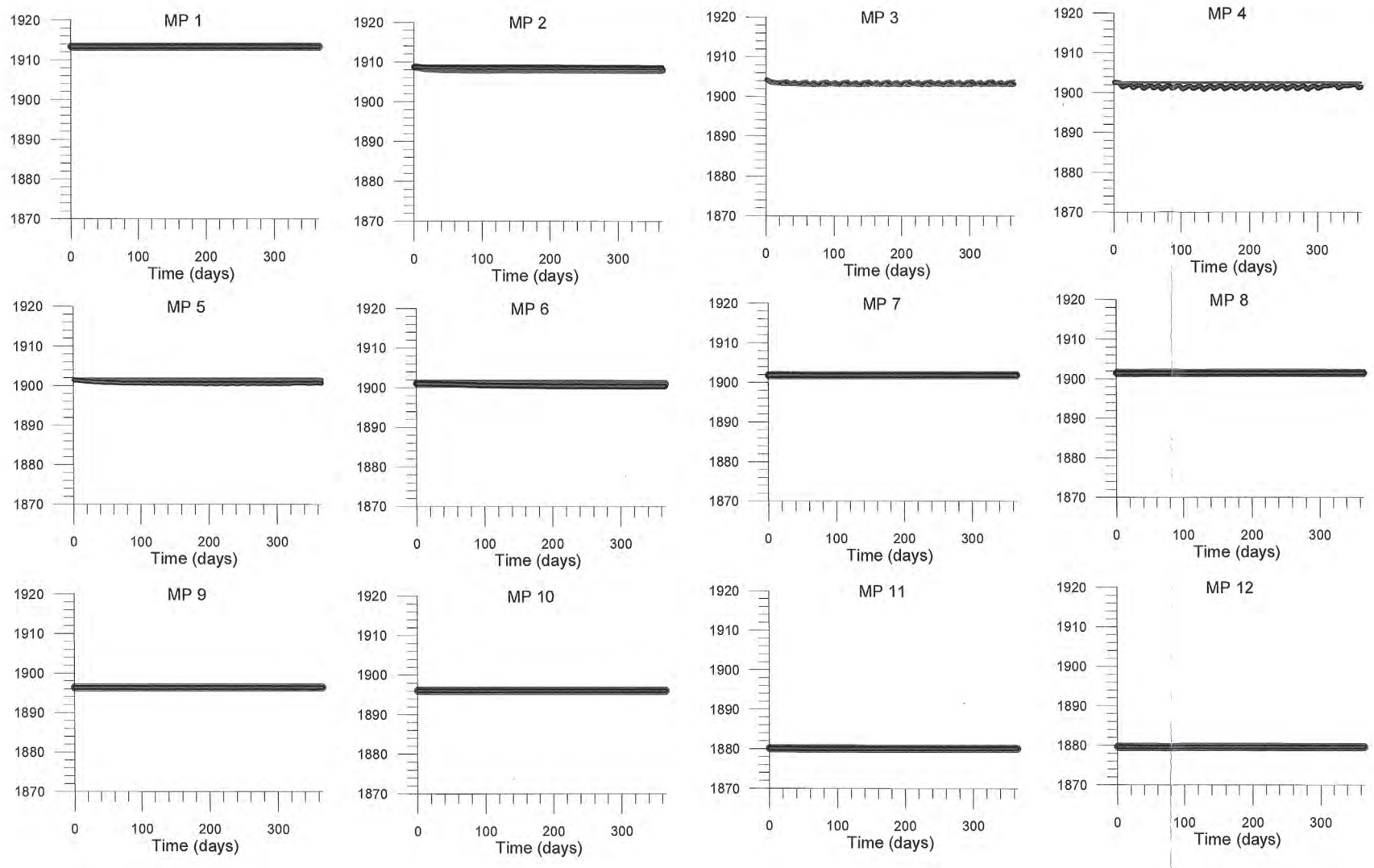
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

1000af0cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
1000 ACRE-FEET
WITH NO FLOW IN RIVER



LEGEND

Current Configuration

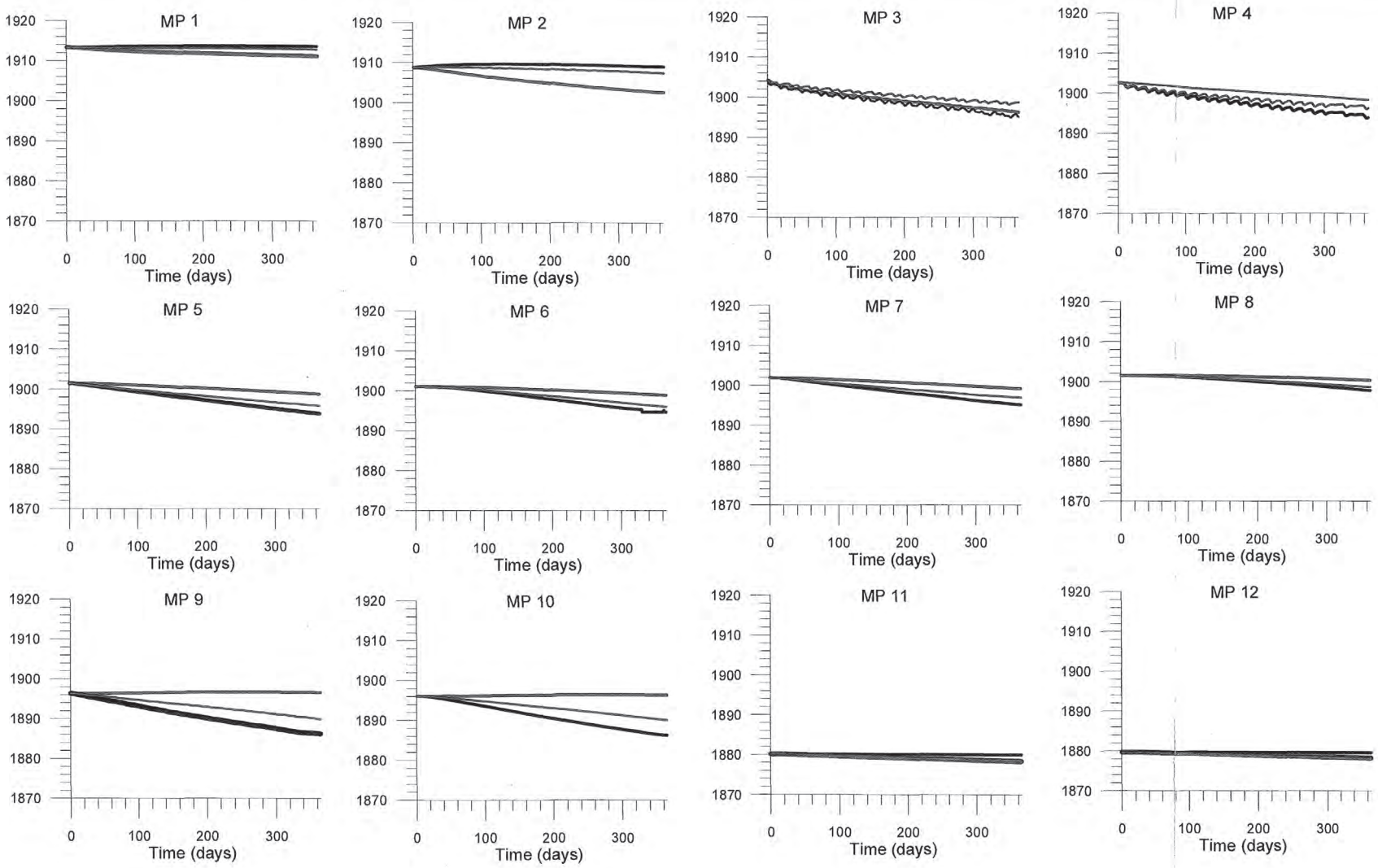
Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

1500af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
1500 ACRE-FEET
WITH 5 cfs FLOW IN RIVER



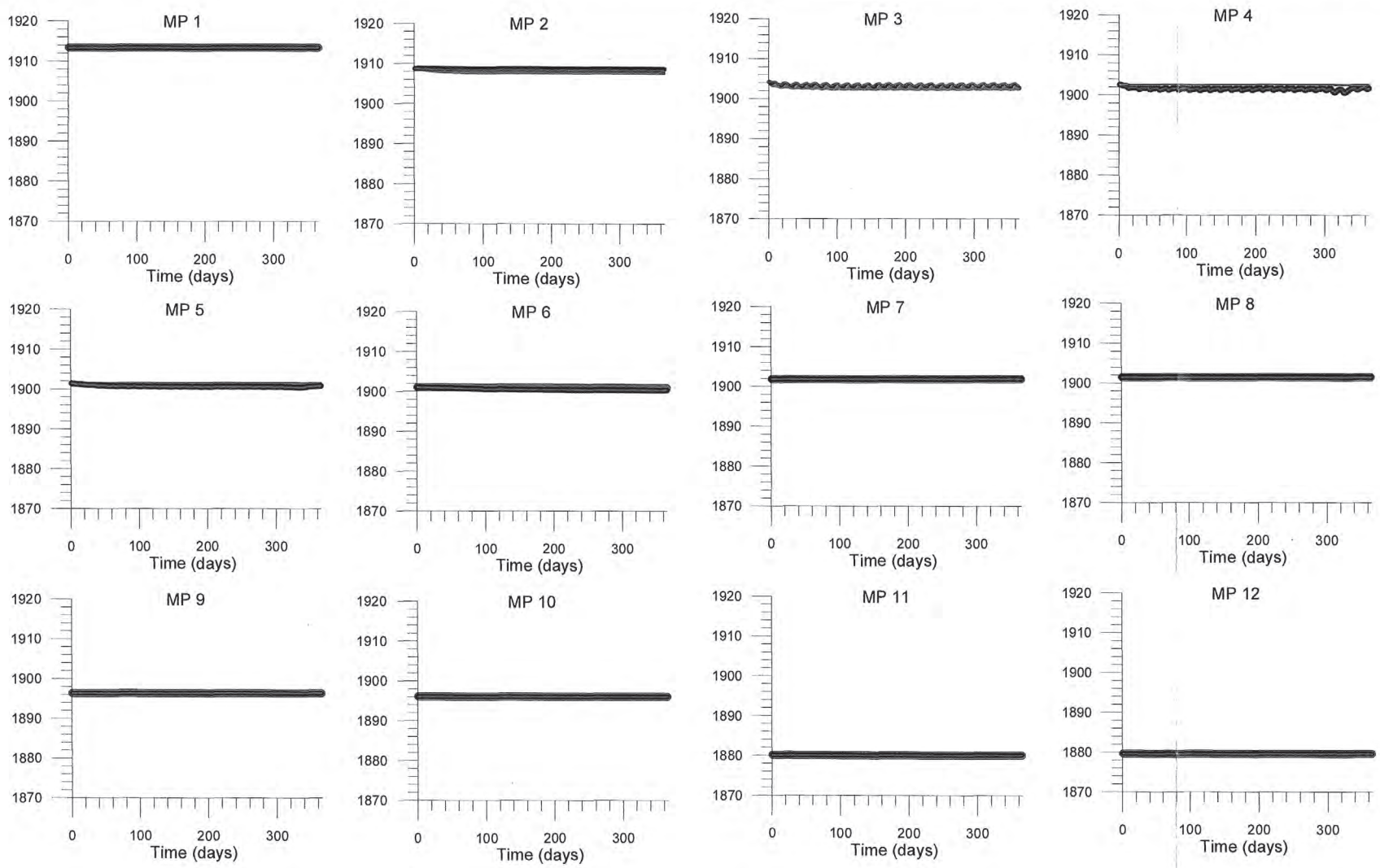
LEGEND

- Current Configuration
- Proposed Configuration
- Proposed Configuration with Maximum Usage from New Wells

1500af0cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
1500 ACRE-FEET
WITH NO FLOW IN RIVER



LEGEND

Current Configuration

Proposed Configuration

Proposed Configuration with Maximum Usage from New Wells

2000af5cfs.grf 9/14/05

Burns & McDonnell SINCE 1898

TARGET HYDROGRAPHS
2000 ACRE-FEET
WITH 5 cfs FLOW IN RIVER

ATTACHMENT 1

Model Pumping Schedules

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
1/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
1/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
1/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
1/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
1/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
1/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
1/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
1/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
1/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
1/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
1/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
1/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
1/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
1/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
1/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
1/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
1/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
1/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
1/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
1/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
1/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
1/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
1/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
1/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
1/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
1/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
1/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
1/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
1/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
1/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
1/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
2/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
2/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
2/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
2/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
2/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
2/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
2/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
2/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
2/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
2/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
2/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
2/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
2/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
2/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
2/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
2/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
2/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
2/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
2/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
2/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
2/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
2/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
2/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
2/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
2/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
2/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
2/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
2/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
3/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
3/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
3/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
3/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
3/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
3/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
3/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
3/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
3/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
3/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
3/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
3/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
3/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
3/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
3/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
3/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
3/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
3/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
3/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
3/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
3/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
3/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
3/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
3/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
3/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
3/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
3/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
3/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
3/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
3/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
3/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
4/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
4/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
4/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
4/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
4/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
4/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
4/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
4/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
4/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
4/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
4/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
4/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
4/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
4/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
4/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
4/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
4/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
4/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
4/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
4/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
4/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
4/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
4/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
4/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
4/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
4/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
4/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
4/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
4/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
4/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
5/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
5/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
5/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
5/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
5/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
5/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
5/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
5/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
5/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
5/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
5/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
5/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
5/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
5/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
5/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
5/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
5/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
5/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
5/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
5/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
5/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
5/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
5/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
5/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
5/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
5/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
5/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
5/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
5/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
5/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
5/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
6/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
6/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
6/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
6/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
6/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
6/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
6/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
6/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
6/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
6/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
6/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
6/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
6/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
6/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
6/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
6/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
6/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
6/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
6/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
6/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
6/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
6/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
6/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
6/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
6/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
6/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
6/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
6/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
6/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
6/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
7/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
7/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
7/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
7/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
7/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
7/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
7/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
7/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
7/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
7/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
7/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
7/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
7/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
7/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
7/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
7/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
7/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
7/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
7/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
7/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
7/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
7/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
7/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
7/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
7/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
7/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
7/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
7/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
7/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
7/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
7/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
8/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
8/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
8/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
8/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
8/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
8/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
8/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
8/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
8/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
8/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
8/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
8/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
8/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
8/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
8/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
8/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
8/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
8/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
8/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
8/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
8/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
8/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
8/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
8/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
8/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
8/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
8/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
8/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
8/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
8/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
8/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
9/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
9/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
9/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
9/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
9/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
9/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
9/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
9/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
9/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
9/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
9/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
9/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
9/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
9/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
9/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
9/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
9/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
9/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
9/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
9/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
9/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
9/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
9/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
9/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
9/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
9/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
9/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
9/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
9/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
9/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
10/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
10/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
10/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
10/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
10/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
10/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
10/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
10/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
10/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
10/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
10/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
10/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
10/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
10/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
10/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
10/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
10/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
10/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
10/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
10/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
10/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
10/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
10/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
10/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
10/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
10/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
10/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
10/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
10/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
10/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
10/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
11/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
11/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
11/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
11/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
11/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
11/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
11/7/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21
11/8/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
11/9/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21
11/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
11/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
11/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
11/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
11/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
11/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
11/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
11/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
11/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
11/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
11/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
11/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
11/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
11/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
11/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
11/25/2005	0	0	0	0	340	0	0	0	0	0	0	250		590	0.850	2.61
11/26/2005	0	0	0	0	340	0	0	0	0	0	0	250		590	0.850	2.61
11/27/2005	0	0	0	0	340	0	0	0	0	0	0	250		590	0.850	2.61
11/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
11/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
11/30/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21
12/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
12/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
12/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
12/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
12/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
12/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
12/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
12/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
12/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
12/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
12/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
12/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
12/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
12/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
12/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
12/19/2005	275	0	0	0	340	0	0	0	0	0	0	0		615	0.886	2.72
12/20/2005	275	0	0	0	340	0	0	0	0	0	0	0		615	0.886	2.72
12/21/2005	275	0	0	0	340	0	0	0	0	0	0	0		615	0.886	2.72
12/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
12/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
12/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
12/25/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/26/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/27/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
12/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
12/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
12/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
	19800	24480	15340	21900	20060	14430	13320	20520	23040	25920	9360	18000		226170	325.893	1000.13
days	72	72	59	60	59	39	36	57	72	96	47	72				
	103680	103680	84960	86400	84960	56160	51840	82080	103680	138240	67392	103680				
MG	28.512	35.251	22.090	31.536	28.886	20.779	19.181	29.549	33.178	37.325	13.478	25.920				
AF	87.50	108.18	67.79	96.78	88.65	63.77	58.86	90.68	101.82	114.55	41.36	79.55	999.49			1000.13

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
1/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
1/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
1/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
1/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
1/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
1/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
1/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
1/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
1/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
1/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
1/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
1/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
1/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
1/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
1/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
1/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
1/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
1/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
2/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
2/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
2/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
2/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
2/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
2/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
2/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
2/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
2/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
2/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
2/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
2/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
2/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
2/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
2/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
2/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
3/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
3/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
3/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
3/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
3/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
3/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
3/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
3/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
3/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
3/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
3/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
3/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
3/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
3/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
3/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
3/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
4/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
4/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
4/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
4/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
4/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
4/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
4/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
4/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
4/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
4/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
4/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
4/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
4/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
4/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
4/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
4/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
4/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
5/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
5/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
5/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
5/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
5/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
5/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
5/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
5/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
5/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
5/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
5/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
5/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
5/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
5/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
6/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
6/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
6/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
6/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
6/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
6/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
6/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
6/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
6/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
6/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
6/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
6/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
6/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
6/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
6/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
6/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
6/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
7/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
7/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
7/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
7/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
7/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
7/14/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
7/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
7/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
7/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
7/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/22/2005	0	0	300	0	0	0	0	300	0	300		900	1.297	3.98
7/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
7/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
7/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
7/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
7/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
8/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
8/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
8/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
8/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
8/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
8/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
8/8/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
8/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
8/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
8/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
8/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
8/14/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
8/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
8/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
8/18/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
8/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
8/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
8/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
8/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
8/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
8/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
8/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
8/26/2005	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
8/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
8/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
8/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
8/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
9/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
9/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
9/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
9/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
9/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
9/8/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
9/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
9/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
9/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
9/14/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
9/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
9/18/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
9/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
9/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
9/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
9/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
9/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
9/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
9/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
9/30/2005	0	300	0	0	0	0	0	0	300	300		900	1.297	3.98
10/1/2005	300	0	300	0	0	0	0	0	0	300		900	1.297	3.98
10/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
10/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
10/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
10/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
10/8/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
10/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
10/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
10/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/13/2005	300	0	0	0	0	0	0	0	300	300		900	1.297	3.98
10/14/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
10/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
10/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
10/18/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
10/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
10/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
10/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
10/24/2005	0	300	0	0	0	0	0	300	300	0		900	1.297	3.98
10/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
10/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
10/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
10/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
10/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
11/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
11/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
11/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
11/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
11/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
11/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
11/8/2005	0	300	0	0	0	0	0	300	300	0		900	1.297	3.98

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
11/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
11/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
11/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
11/14/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
11/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
11/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
11/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
11/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
11/20/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
11/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
11/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
11/25/2005	0	0	300	0	0	0	0	0	300	300		900	1.297	3.98
11/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
11/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
11/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
11/30/2005	0	300	300	0	0	0	0	0	300	0		900	1.297	3.98
12/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
12/2/2005	0	300	0	0	0	0	0	300	300	0		900	1.297	3.98
12/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
12/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
12/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
12/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
12/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
12/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
12/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
12/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
12/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
12/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
12/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
12/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
12/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
12/22/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
12/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
12/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
12/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
12/26/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
12/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
12/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
12/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
	36300	35700	36000	0	0	0	0	50400	33900	33900		226200	325.937	1000.27
days	132	105	138	0	0	0	0	187	170	136				
	190080	151200	199385	0	0	0	0	268800	244080	195264				
MG	52.272	51.408	51.840	####	0.000	0.000	0.000	72.576	48.816	48.816				
AF	160.42	157.77	159.09	0.00	0.00	0.00	0.00	222.73	149.81	149.81				1000.27
Day	S-8	S-7	S-6	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
1/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
1/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
1/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
1/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
1/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
1/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
1/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
1/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
2/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
2/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
2/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
2/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
2/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
3/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
3/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
3/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
3/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
3/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
3/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
3/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
3/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
4/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
4/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
4/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
4/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
4/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
4/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
4/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
5/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
5/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
5/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
5/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
5/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
5/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
5/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
5/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
6/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
6/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
6/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
6/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
6/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
6/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
6/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
6/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
6/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
6/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
6/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
7/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
7/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
7/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
7/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
7/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
7/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
7/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
7/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
8/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
8/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
8/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
8/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
8/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
8/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
8/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
8/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
9/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
9/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
9/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
9/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
9/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
9/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
9/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
10/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
10/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
10/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
10/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
10/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
10/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
10/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
10/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
11/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
11/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
11/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
11/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
11/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/9/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/10/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/11/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/12/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
11/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
11/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
11/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
11/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
11/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
11/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
11/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
11/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
11/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
12/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/9/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/10/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/11/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/12/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
12/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
12/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
12/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
12/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
12/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
12/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
12/28/2005	275	0	260	0	0	0	0	0	0	270	0	250		1055	1.520	4.67
12/29/2005	275	0	260	0	0	0	0	0	0	270	0	0		805	1.160	3.56
12/30/2005	275	0	260	0	0	0	0	0	0	270	0	0		805	1.160	3.56
12/31/2005	275	0	260	0	0	0	0	0	0	270	0	0		805	1.160	3.56
	27500	32640	22100	27740	32640	31080	27380	34560	30720	24030	24960	24000		339350	488.977	1500.62
days	100	96	85	76	96	84	74	96	96	89	125	96				
	144000	138240	122400	109440	138240	120960	106560	138240	138240	128160	179712	138240				
MG	39.600	47.002	31.824	39.946	47.002	44.755	39.427	49.766	44.237	34.603	35.942	34.560				
AF	121.53	144.24	97.66	122.59	144.24	137.35	121.00	152.73	135.76	106.19	110.30	106.06				1500.62

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
1/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/5/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/6/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/21/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/22/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
1/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
1/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
2/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/17/2005	0	300	0	0	0	0	0	0	300	0	280	0		860	1.239	3.80
2/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
3/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
3/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
3/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
4/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
4/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
5/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
5/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
5/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
6/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
6/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
6/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
7/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
7/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.83
7/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
7/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
7/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
7/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
7/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
8/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.83
8/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
8/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
8/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
8/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
11/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
11/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
12/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
12/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
12/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
	26400	28800	21060	28800	28800	28800	23100	28800	37500	25920	37440	24000		339420	489.078	1500.93
days	96	85	81	79	85	78	62	80	117	96	187	96				
	138240	121976	116640	113622	121976	112086	89903	115200	168750	138240	269568	138240				
MG	38.016	41.472	30.326	41.472	41.472	41.472	33.264	41.472	54.000	37.325	53.914	34.560				
AF	116.67	127.27	93.07	127.27	127.27	127.27	102.08	127.27	165.72	114.55	165.45	106.06				1500.93

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	1500.40			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
1/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
1/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
1/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/13/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
1/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
1/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
1/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
2/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/13/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
2/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
2/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
3/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
3/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/14/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	1500.40			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
3/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
3/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
3/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
4/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
4/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
4/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
4/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
4/30/2005	0	300	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
5/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
5/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
5/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/9/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
5/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
5/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
5/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
6/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
6/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
6/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
6/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
6/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	1500.40				
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
8/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
8/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
8/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
8/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
8/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
8/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
9/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
9/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
9/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
9/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
9/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
9/30/2005	0	300	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
10/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
10/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
10/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
10/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
10/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
10/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
10/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
11/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
11/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	1500.40			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
11/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
11/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
11/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
11/30/2005	0	300	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
12/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
12/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
12/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
12/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/20/2005	300	0	0	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
12/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
12/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
12/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
	65700	67200	69900	0	0	0	0	0	0	73800	31800	30900		339300	488.905	1500.40
days	239	198	269	0	0	0	0	0	0	273	159	124				
	344029	284612	387138	0	0	0	0	0	0	393600	228960	177984				
MG	94.608	96.768	100.656	0.000	0.000	0.000	0.000	0.000	0.000	106.272	45.792	44.496				
AF	290.34	296.97	308.90	0.00	0.00	0.00	0.00	0.00	0.00	326.14	140.53	136.55				1500.40
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
1/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
1/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
2/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
2/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
2/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
2/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
2/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
3/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
3/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
3/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
3/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
3/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
3/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
3/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
3/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
3/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
3/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
4/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
4/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
5/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
5/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
6/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
6/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
6/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
6/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
6/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
6/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
7/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
7/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
8/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
8/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
8/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
9/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
9/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
10/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.785	5.42
10/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
10/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
11/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/3/2005	0	0	260	0	340	0	0	0	0	270	0	0		870	1.254	3.85
11/4/2005	275	0	260	0	340	0	0	0	0	270	0	0		1145	1.650	5.06
11/5/2005	275	0	260	0	340	0	0	0	0	270	0	0		1145	1.650	5.06
11/6/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/7/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/8/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
11/9/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/10/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/11/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/12/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/13/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/14/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/15/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/16/2005	0	0	260	0	340	0	0	0	0	270	0	250		1120	1.614	4.95
11/17/2005	0	0	260	0	340	0	0	0	0	270	0	250		1120	1.614	4.95
11/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/20/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/21/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/22/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/23/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/24/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/25/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/26/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/27/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/28/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/29/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/30/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
12/1/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/2/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/3/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/4/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/16/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/17/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/18/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/19/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
	40700	42500	31200	27740	30600	28120	44400	59040	38400	45630	31200	32750		452280	651.700	2000.00
days	148	125	120	76	90	76	120	164	120	169	156	131				
	213120	180000	172800	109440	129600	109440	172800	236160	172800	243360	224640	188640				
MG	58.608	61.200	44.928	39.946	44.064	40.493	63.936	85.018	55.296	65.707	44.928	47.160				
AF	179.86	187.82	137.88	122.59	135.23	124.27	196.21	260.91	169.70	201.65	137.88	144.73				2000.00

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
3/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
5/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
7/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
9/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
11/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
	38469	38469	38469	38469	38469	38469	38469	38469	38469	38469	34016	34016		452717	652.331	2001.94
days	140	113	148	105	113	104	104	107	120	142	170	136				
	201435	162926	213057	151766	162926	149716	149716	153874	173109	205166	244914	195931				
MG	55.395	55.395	55.395	55.395	55.395	55.395	55.395	55.395	55.395	55.395	48.983	48.983				
AF	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	150.32	150.32				2001.94
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
1/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/13/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
1/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
1/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
1/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
1/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
2/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/12/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/24/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
2/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/28/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
3/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/10/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/24/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/10/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/12/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/24/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/26/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/12/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
5/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/24/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/26/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
5/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
6/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
6/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/24/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
7/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
7/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
7/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
8/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
8/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
8/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
9/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
9/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
10/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
10/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
11/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/10/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/12/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
11/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
11/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/28/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/11/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/12/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
12/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/23/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
	88500	99900	95100	0	0	0	0	0	0	101400	33600	33900		452400	651.873	2000.53
days	322	294	366	0	0	0	0	0	0	376	168	136				
	463418	423106	526708	0	0	0	0	0	0	540800	241920	195264				
MG	127.440	143.856	136.944	0.000	0.000	0.000	0.000	0.000	0.000	146.016	48.384	48.816				
AF	391.10	441.48	420.27	0.00	0.00	0.00	0.00	0.00	0.00	448.11	148.49	149.81				2000.53
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2285 Acre -Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2284.98			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/11/2005	275	0	260	0	340	0	370	0	0	0	260	0		1505	2.169	6.66
1/12/2005	275	0	0	0	0	370	0	320	0	0	260	0		1225	1.765	5.42
1/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/22/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/23/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/24/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/25/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/26/2005	275	0	260	0	0	370	0	360	0	0	0	250		1515	2.183	6.70
1/27/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
1/28/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
1/29/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
1/30/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
1/31/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
2/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/11/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/12/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/22/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/23/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/24/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/25/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/26/2005	275	0	260	0	0	370	0	360	0	270	0	0		1535	2.212	6.79
2/27/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
2/28/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
3/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/11/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/12/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
3/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
3/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77

2285 Acre -Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2284.98			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
3/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
3/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
3/22/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
3/23/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
3/24/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
3/25/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
3/26/2005	275	0	260	0	0	370	0	360	0	270	0	0		1535	2.212	6.79
3/27/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
3/28/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
3/29/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
3/30/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
3/31/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
4/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
4/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
4/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
4/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
4/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
4/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
4/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
4/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
4/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
4/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
4/11/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
4/12/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
4/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
4/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
4/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
4/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
4/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
4/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
4/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
4/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
4/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
4/22/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
4/23/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
4/24/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
4/25/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
4/26/2005	275	0	260	0	0	370	0	360	0	270	0	0		1535	2.212	6.79
4/27/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
4/28/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
4/29/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
4/30/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
5/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
5/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
5/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
5/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
5/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
5/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
5/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
5/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
5/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
5/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
5/11/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
5/12/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
5/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
5/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
5/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
5/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
5/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
5/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
5/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
5/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
5/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
5/22/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
5/23/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
5/24/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
5/25/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
5/26/2005	275	0	260	0	0	370	0	360	0	270	0	0		1535	2.212	6.79
5/27/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	8.94
5/28/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	8.94
5/29/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
5/30/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
5/31/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
6/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
6/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
6/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
6/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
6/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90

2285 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2285.76			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/27/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
4/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/4/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
4/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
4/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/19/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
4/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/27/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
5/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/4/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
5/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/10/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/13/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
5/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/19/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
5/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/27/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/1/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
6/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/4/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
6/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63

2285 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2285.76			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
6/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/11/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
6/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/19/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
6/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/27/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
7/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/4/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
7/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/11/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/13/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
7/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/19/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
7/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/27/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
8/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/4/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
8/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
8/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/19/2005	300	300	300	0	300	0	0	0	0	300	0	0		1500	2.161	6.63
8/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63

2285 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2285.76			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
8/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/27/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
9/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
9/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/19/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/27/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
10/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/17/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
10/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/19/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/27/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/2/2005	300	300	300	300	0	0	0	0	0	300	0	0		1500	2.161	6.63
11/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31

2285 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2285.76			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/17/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/19/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/27/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/3/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/7/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/9/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/11/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/13/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/15/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/16/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/17/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/18/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/19/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/20/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/21/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/22/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/23/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/24/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/25/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/27/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/28/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
	109500	109500	109500	6300	4800	0	0	0	0	109500	33900	33900		516900	744.813	2285.76
days	398	322	421	17	14	0	0	0	0	406	170	136				
	573382	463765	606462	24855	20329	0	0	0	0	584000	244080	195264				
MG	157.680	157.680	157.680	9.072	6.912	0.000	0.000	0.000	0.000	157.680	48.816	48.816				
AF	483.90	483.90	483.90	27.84	21.21	0.00	0.00	0.00	0.00	483.90	149.81	149.81				2285.76
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2285 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2284.72			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
1/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
2/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
3/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
3/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
3/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
3/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
3/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
3/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26

2285 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2284.72				
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF	
3/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
3/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
4/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	
5/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26	

2285 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2284.72			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
5/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
5/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
6/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26

2285 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2284.72			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
7/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
7/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
8/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26

2285 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2284.72			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
9/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
9/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
10/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26

2285 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2284.72			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
11/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
11/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/1/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/2/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/3/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/4/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/5/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/6/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/7/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/8/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/9/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/10/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/11/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/12/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/13/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/14/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/15/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/16/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/17/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/18/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/19/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/20/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/21/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/22/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/23/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/24/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/25/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/26/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/27/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/28/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/29/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/30/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
12/31/2005	123	123	123	123	123	123	123	123	123	123	93	93		1416	2.040	6.26
	44863	44863	44863	44863	44863	44863	44863	44863	44863	44863	34016	34016		516666	744.475	2284.72
days	163	132	173	123	132	121	121	125	140	166	170	136				
	234921	190010	248474	176995	190010	174603	174603	179454	201885	239271	244914	195931				
MG	64.603	64.603	64.603	64.603	64.603	64.603	64.603	64.603	64.603	64.603	48.983	48.983				
AF	198.26	198.26	198.26	198.26	198.26	198.26	198.26	198.26	198.26	198.26	150.32	150.32				2284.72
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2800 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2800.33			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
1/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
1/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
1/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
1/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
1/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
1/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
1/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
1/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
1/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
1/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
1/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
1/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
1/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
2/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
2/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
2/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
2/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
2/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
2/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
2/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
2/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
2/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
2/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
2/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
3/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
3/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
3/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
3/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
3/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54

2800 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2800.33			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
3/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
3/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
3/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
3/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
4/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
4/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
4/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
4/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
4/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
4/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
4/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
4/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
4/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
4/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
4/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
4/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
4/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
5/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
5/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
5/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
5/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
5/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
5/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
5/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
5/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
6/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54

2800 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2800.33			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
6/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/7/2005	0	340	0	365	0	370	0	360	0	0	280	0		1695	2.442	7.50
6/8/2005	0	340	0	365	0	370	0	360	0	0	280	0		1695	2.442	7.50
6/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
6/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
6/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
6/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
6/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
6/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
6/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
6/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
6/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
6/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
6/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
6/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
6/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
6/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
6/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
6/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
6/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
7/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
7/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
7/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
7/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
7/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
7/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
7/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
7/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
8/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
8/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
8/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
8/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
8/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
8/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
8/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
8/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
8/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
8/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50

2800 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2800.33			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
8/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
8/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
8/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
8/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
9/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
9/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
9/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
9/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
9/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
9/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
9/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
9/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
9/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
9/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
9/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
9/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
9/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
10/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
10/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
10/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
10/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
10/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
10/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
10/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
10/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
11/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
11/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50

2800 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2800.33			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
11/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
11/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
11/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
11/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
11/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
11/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
11/15/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/16/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/17/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/18/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
11/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
11/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
11/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
11/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
11/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
11/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
11/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
11/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
11/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
11/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/1/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/2/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/3/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/4/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/5/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/6/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/7/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/8/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/9/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/10/2005	275	0	260	0	340	0	370	0	320	0	260	0		1825	2.630	8.07
12/11/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/12/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/13/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/14/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/15/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/16/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/17/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/18/2005	275	0	260	0	340	0	370	0	320	0	0	250		1815	2.615	8.03
12/19/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/20/2005	0	340	0	365	0	370	0	360	0	270	0	0		1705	2.457	7.54
12/21/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/22/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/23/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/24/2005	0	340	0	365	0	370	0	360	0	0	260	0		1695	2.442	7.50
12/25/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/26/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/27/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/28/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/29/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/30/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
12/31/2005	275	0	260	0	340	0	370	0	0	270	0	250		1765	2.543	7.80
	38775	76160	36660	81760	47940	82880	52170	80640	20480	58590	24960	32250		633265	912.486	2800.33
days	141	224	141	224	141	224	141	224	64	217	125	129				
	203040	322560	203040	322560	203040	322560	203040	322560	92160	312480	179712	185760				
MG	55.836	######	52.780	######	69.034	######	75.125	######	29.491	84.370	35.942	48.440				
AF	171.35	336.57	162.01	361.31	211.86	366.26	230.55	356.36	90.51	258.92	110.30	142.52				2800.33
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

ATTACHMENT 2

Model Water Budgets

Modeled Water Budget Summary
Acre Feet for One Year

Scenario 1 - River 5 cfs

Current Configuration

	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	55.7	389.2	562.4	1007.3	999.5	7.8
1500 AF	83.9	392.4	1029.7	1506.0	1499.7	6.3
2000 AF	117.8	395.7	1491.7	2005.2	1998.7	6.5
2285 AF	134.6	397.7	1757.3	2289.6	2283.5	6.1
2800 AF	170.3	401.4	2232.7	2804.4	2798.5	5.9

Proposed Configuration

	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	59.8	389.4	558.6	1007.8	999.5	8.3
1500 AF	92.1	392.6	1022.4	1507.1	1499.7	7.4
2000 AF	121.6	396.1	1488.7	2006.4	1998.7	7.7
2285 AF	147.3	398.0	1745.0	2290.3	2283.5	6.8
2800 AF	186.1	401.8	2216.4	2804.3	2798.5	5.8

Scenario 2 - River 5 cfs - New Wells used to maximum

Proposed Configuration

	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	62.7	389.6	553.6	1005.9	999.6	6.3
1500 AF	100.2	393.1	1011.6	1504.9	1499.4	5.5
2000 AF	144.1	396.7	1464.1	2004.9	1999.2	5.7
2285 AF	162.9	398.9	1729.1	2290.9	2284.3	6.6

Scenario 3 - No flow in River

Current Configuration

	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	790.0	205.7	0	995.7	987.0	8.7
1500 AF	1207.9	211.5	0	1419.4	1411.1	8.3
2000 AF	1790.1	218.9	0	2009.0	2000.6	8.4
2285 AF	2013.1	223.5	0	2236.6	2228.2	8.4
2800 AF	1923.2	227.8	0	2151.0	2142.9	8.1

Proposed Configuration

	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	759.2	245.5	0	1004.7	999.5	5.2
1500 AF	1141.5	365.7	0	1507.2	1497.6	9.6
2000 AF	1707.9	301.6	0	2009.5	2000.6	8.9
2285 AF	1974.2	318.0	0	2292.2	2283.2	9.0
2800 AF	2147.6	304.5	0	2452.1	2443.4	8.7

Scenario 4 - No flow in River - New Wells used to maximum

Proposed Configuration

	Storage	Underflow	Stream	Total	Pumping	Error
1000 AF	717.8	290.8	0	1008.6	999.6	9.0
1500 AF	1228.9	263.3	0	1492.2	1484.0	8.2
2000 AF	1576.7	421.3	0	1998.0	1988.5	9.5
2285 AF	1386.7	434.7	0	1821.4	1811.4	10.0

1000 AF - Current Configuration with 5 cfs flow in river

Current 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		205,957.19	7,273,310.11	166.97		153,341.38	5,415,200.06	124.32	42.7
Well						201,495.91	7,115,761	163	-163.4
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,238.62	3,504,579	80		21,090.47	744,803	17	63.4
Stream		184,829.47	6,527,192	150		113,234.81	3,998,850	92	58.0
TOTAL		490,661	17,327,541	398		489,163	17,274,615	397	1.2

In minus out 1,498.72
error % 0.31

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		393,482.78	13,895,714.57	319.00		332,150.72	11,729,793.02	269.28	49.7
Well						403,019.31	14,232,494.02	326.73	-326.7
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,304.44	7,003,056	161		41,906.60	1,479,918	34	126.8
Stream		408,366.78	14,421,338	331		221,273.52	7,814,201	179	151.7
TOTAL		1,001,426	35,365,029	812		998,350	35,256,406	809	2.5

In minus out 3,075.88
error % 0.31

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		577,690.69	20,400,955.99	468.34		513,816.53	18,145,261.24	416.56	51.8
Well						604,324.13	21,341,507.05	489.93	-489.9
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	297,366.13	10,501,387	241		62,664.79	2,212,986	51	190.3
Stream		636,331.19	22,471,826	516		327,830.94	11,577,241	266	250.1
TOTAL		1,513,296	53,441,549	1,227		1,508,636	53,276,996	1,223	3.8

In minus out 4,659.50
error % 0.31

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,152,000.25	40,682,508.67	933.94		1,083,308.63	38,256,686.60	878.25	55.7
Well						1,232,848.63	43,537,642.35	999.49	-999.5
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	602,804.19	21,287,831	489		126,557.04	4,469,320	103	386.1
Stream		1,347,520.88	47,587,255	1,092		653,770.13	23,087,676	530	562.4
TOTAL		3,106,194	109,694,226	2,518		3,096,484	109,351,325	2,510	7.9

In minus out 9,709.75
error % 0.31

1500 AF - Current Configuration with 5 cfs flow in river

Current 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		278,046.75	9,819,129.22	225.42		192,047.02	6,782,076.98	155.70	69.7
Well						305,092.28	10,774,233	247	-247.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,239.27	3,504,602	80		20,684.12	730,453	17	63.7
Stream		250,601.88	8,849,923	203		109,798.55	3,877,500	89	114.2
TOTAL		628,524	22,196,114	510		627,622	22,164,263	509	0.7

In minus out 901.90
error % 0.14

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		520,351.31	18,376,034.89	421.86		420,874.50	14,863,044.08	341.21	80.6
Well						609,966.00	21,540,748.00	494.51	-494.5
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,314.41	7,003,408	161		40,868.93	1,443,273	33	127.6
Stream		566,840.00	20,017,768	460		212,857.30	7,516,985	173	287.0
TOTAL		1,286,778	45,442,131	1,043		1,284,567	45,364,050	1,041	1.8

In minus out 2,211.13
error % 0.17

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		759,473.81	26,820,567.06	615.72		655,183.38	23,137,584.68	531.17	84.5
Well						914,948.13	32,311,091.10	741.76	-741.8
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	297,389.78	10,502,222	241		60,958.38	2,152,725	49	191.7
Stream		890,541.06	31,449,164	722		314,676.19	11,112,686	255	466.9
TOTAL		1,949,313	68,839,333	1,580		1,945,766	68,714,086	1,577	2.9

In minus out 3,546.75
error % 0.18

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,474,919.75	52,086,304.25	1,195.74		1,371,379.25	48,429,805.66	1,111.80	83.9
Well						1,849,796.13	65,324,939.72	1,499.65	-1499.7
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	602,884.19	21,290,656	489		122,746.24	4,334,743	100	389.3
Stream		1,897,786.00	67,019,686	1,539		627,631.38	22,164,595	509	1029.7
TOTAL		3,979,459	140,533,278	3,226		3,971,553	140,254,083	3,220	6.4

In minus out 7,906.00
error % 0.20

1000 AF - Proposed Configuration with 5 cfs flow in river

Proposed 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		209,865.17	7,411,319.29	170.14		159,884.97	5,646,284.91	129.62	40.5
Well						201,495.91	7,115,761	163	-163.4
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,261.76	3,505,396	80		21,072.85	744,181	17	63.4
Stream		178,641.22	6,308,656	145		104,394.42	3,686,655	85	60.2
TOTAL		488,404	17,247,831	396		486,848	17,192,882	395	1.3

In minus out 1556 m3
error % 0.32

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		405,861.28	14,332,857.21	329.04		344,062.19	12,150,442.61	278.94	50.1
Well						403,019.31	14,232,494.02	326.73	-326.7
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,372.83	7,005,471	161		41,901.55	1,479,740	34	126.9
Stream		385,651.44	13,619,153	313		198,931.86	7,025,213	161	151.4
TOTAL		991,158	35,002,402	804		987,915	34,887,889	801	2.6

In minus out 3242.6 m3
error % 0.33

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		598,233.88	21,126,431.88	485.00		532,814.94	18,816,183.69	431.96	53.0
Well						604,324.13	21,341,507.05	489.93	-489.9
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	297,480.47	10,505,425	241		62,665.12	2,212,998	51	190.4
Stream		598,672.44	21,141,920	485		291,521.06	10,294,970	236	249.0
TOTAL		1,496,295	52,841,156	1,213		1,491,325	52,665,659	1,209	4.0

In minus out 4969.5 m3
error % 0.33

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,196,872.25	42,267,148.54	970.32		1,123,127.63	39,662,881.44	910.53	59.8
Well						1,232,848.63	43,537,642.35	999.49	-999.5
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	603,063.44	21,296,986	489		126,568.63	4,469,729	103	386.3
Stream		1,263,163.38	44,608,198	1,024		574,145.69	20,275,765	465	558.6
TOTAL		3,066,968	108,308,964	2,486		3,056,691	107,946,019	2,478	8.3

In minus out 10277.25 m3
error % 0.34

1500 AF - Proposed Configuration with 5 cfs flow in river

Proposed 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		281,800.56	9,951,693.87	228.46		200,893.98	7,094,504.76	162.87	65.6
Well						305,092.28	10,774,233	247	-247.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,267.30	3,505,592	80		20,652.05	729,320	17	63.7
Stream		242,521.14	8,564,554	197		96,639.05	3,412,776	78	118.3
TOTAL		**624,225**	**22,044,300**	**506**		**623,277**	**22,010,835**	**505**	0.8

In minus out 947.6 m3
error % 0.15

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		537,883.63	18,995,182.72	436.07		439,179.63	15,509,483.53	356.05	80.0
Well						609,966.00	21,540,748.00	494.51	-494.5
Underflow	Well	1,272.00	44,920.31	1.03					1.0
	GHB	198,397.81	7,006,353	161		40,850.18	1,442,610	33	127.7
Stream		535,204.81	18,900,581	434		180,220.06	6,364,412	146	287.8
TOTAL		**1,272,758**	**44,947,038**	**1,032**		**1,270,216**	**44,857,254**	**1,030**	2.1

In minus out 2542.5 m3
error % 0.20

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		790,558.50	27,918,312.54	640.92		685,200.81	24,197,640.58	555.50	85.4
Well						914,948.13	32,311,091.10	741.76	-741.8
Underflow	Well	1,908.00	67,380.99	1.55					1.5
	GHB	297,532.56	10,507,264	241		60,947.12	2,152,327	49	191.8
Stream		837,224.88	29,566,320	679		261,995.05	9,252,269	212	466.3
TOTAL		**1,927,224**	**68,059,277**	**1,562**		**1,923,091**	**67,913,328**	**1,559**	3.4

In minus out 4132.9 m3
error % 0.21

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,553,862.88	54,874,154.66	1,259.74		1,440,290.50	50,863,383.71	1,167.66	92.1
Well						1,849,796.13	65,324,939.72	1,499.65	-1499.7
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	603,208.69	21,302,116	489		122,761.81	4,335,293	100	389.5
Stream		1,771,207.13	62,549,595	1,436		510,077.06	18,013,203	414	1022.4
TOTAL		**3,932,148**	**138,862,497**	**3,188**		**3,922,926**	**138,536,819**	**3,180**	7.5

In minus out 9222 m3
error % 0.23

2000 AF - Proposed Configuration with 5 cfs flow in river

Proposed 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		337,936.88	11,934,129.22	273.97		224,391.84	7,924,323.91	181.92	92.1
Well						406,153.44	14,343,175	329	-329.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,344.26	3,508,310	81		20,295.00	716,711	16	64.1
Stream		303,316.63	10,711,527	246		89,483.20	3,160,070	73	173.4
TOTAL		**741,234**	**26,176,426**	**601**		**740,323**	**26,144,280**	**600**	0.7

In minus out 910.25 m3
error % 0.12

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		630,861.69	22,278,672.31	511.45		494,989.09	17,480,376.50	401.29	110.2
Well						812,198.94	28,682,537.45	658.46	-658.5
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,713.95	7,017,518	161		40,025.54	1,413,489	32	128.7
Stream		684,193.38	24,162,063	555		165,331.26	5,838,619	134	420.6
TOTAL		**1,515,041**	**53,503,174**	**1,228**		**1,512,545**	**53,415,022**	**1,226**	2.0

In minus out 2496 m3
error % 0.16

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		915,647.38	32,335,784.88	742.33		771,181.75	27,234,029.01	625.21	117.1
Well						1,218,299.63	43,023,849.22	987.69	-987.7
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	298,125.22	10,528,194	242		59,640.16	2,106,172	48	193.3
Stream		1,077,566.38	38,053,901	874		239,970.30	8,474,472	195	679.1
TOTAL		**2,293,247**	**80,985,260**	**1,859**		**2,289,092**	**80,838,523**	**1,856**	3.4

In minus out 4155 m3
error % 0.18

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,774,290.25	62,658,474.66	1,438.44		1,624,330.00	57,362,677.92	1,316.87	121.6
Well						2,465,380.75	87,064,107.61	1,998.72	-1998.7
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	604,701.31	21,354,827	490		119,894.62	4,234,039	97	393.0
Stream		2,303,232.50	81,337,896	1,867		466,961.00	16,490,574	379	1488.7
TOTAL		**4,686,093**	**165,487,829**	**3,799**		**4,676,566**	**165,151,398**	**3,791**	7.7

In minus out 9526.5 m3
error % 0.20

2285 AF - Proposed Configuration with 5 cfs flow in river

Proposed 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		363,147.34	12,824,428.61	294.41		232,763.97	8,219,982.75	188.70	105.7
Well						455,920.97	16,100,699	370	-369.6
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,401.04	3,510,315	81		20,151.99	711,661	16	64.2
Stream		337,189.88	11,907,749	273		91,122.45	3,217,959	74	199.5
TOTAL		**800,374**	**28,264,953**	**649**		**799,959**	**28,250,301**	**649**	0.3

In minus out 414.8 m3
error % 0.05

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		677,136.88	23,912,865.29	548.96		516,246.19	18,231,063.75	418.53	130.4
Well						920,890.69	32,520,950.74	746.58	-746.6
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,918.06	7,024,726	161		39,671.83	1,400,998	32	129.1
Stream		768,116.69	27,125,787	623		166,839.73	5,891,890	135	487.5
TOTAL		**1,645,444**	**58,108,299**	**1,334**		**1,643,648**	**58,044,902**	**1,333**	1.5

In minus out 1795.1 m3
error % 0.11

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		982,820.38	34,707,977.21	796.79		811,627.63	28,662,361.74	658.00	138.8
Well						1,384,989.25	48,910,438.32	1,122.83	-1122.8
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	298,498.44	10,541,374	242		59,038.38	2,084,921	48	194.1
Stream		1,215,946.88	42,940,763	986		240,188.47	8,482,177	195	791.1
TOTAL		**2,499,174**	**88,257,494**	**2,026**		**2,495,844**	**88,139,897**	**2,023**	2.7

In minus out 3329.8 m3
error % 0.13

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,908,492.25	67,397,774.01	1,547.24		1,726,787.38	60,980,926.31	1,399.93	147.3
Well						2,816,659.75	99,469,409.57	2,283.50	-2283.5
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	605,621.25	21,387,315	491		118,457.78	4,183,297	96	394.9
Stream		2,615,412.50	92,362,429	2,120		463,309.06	16,361,607	376	1744.7
TOTAL		**5,133,395**	**181,284,150**	**4,162**		**5,125,214**	**180,995,240**	**4,155**	6.6

In minus out 8181 m3
error % 0.16

2800 AF - Proposed Configuration with 5 cfs flow in river

Proposed 5 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		382,629.29	13,512,427.01	310.20		218,635.89	7,721,054.33	177.25	133.0
Well						566,576.19	20,008,451	459	-459.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,583.39	3,516,755	81		19,845.60	700,841	16	64.6
Stream		412,618.78	14,571,496	335		91,135.95	3,218,436	74	260.6
TOTAL		895,467	31,623,138	726		896,194	31,648,782	727	-0.6

In minus out -726.1 m3
error % -0.08

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		685,143.69	24,195,623.23	555.46		486,598.66	17,184,070.97	394.49	161.0
Well						1,133,806.38	40,039,997.98	919.19	-919.2
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	199,404.58	7,041,907	162		38,924.05	1,374,590	32	130.1
Stream		941,427.63	33,246,206	763		167,334.75	5,909,371	136	627.6
TOTAL		1,827,248	64,528,656	1,481		1,826,664	64,508,030	1,481	0.5

In minus out 584.0 m3
error % 0.03

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		980,994.81	34,643,508.08	795.31		770,011.06	27,192,686.57	624.26	171.0
Well						1,700,706.88	60,059,902.06	1,378.79	-1378.8
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	299,304.97	10,569,856	243		57,807.52	2,041,453	47	195.8
Stream		1,489,526.88	52,602,150	1,208		241,104.00	8,514,508	195	1012.1
TOTAL		2,771,735	97,882,895	2,247		2,769,629	97,808,550	2,245	1.7

In minus out 2105.0 m3
error % 0.08

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,878,998.50	66,356,211.96	1,523.33		1,649,498.88	58,251,508.44	1,337.27	186.1
Well						3,451,921.75	121,903,477.47	2,798.52	-2798.5
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	607,430.00	21,451,190	492		115,660.05	4,084,496	94	398.7
Stream		3,198,447.25	112,952,109	2,593		464,548.88	16,405,390	377	2216.4
TOTAL		5,688,745	200,896,143	4,612		5,681,630	200,644,873	4,606	5.8

In minus out 7115.5 m3
error % 0.13

Max in new wells

Proposed 5 cfs

1000 AF - Proposed Configuration with 5 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		185,931.83	6,566,121.15	150.74		136,995.59	4,837,954.19	111.06	39.7
Well						196,235.67	6,929,998	159	-159.1
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,279.94	3,506,038	80		21,095.79	744,991	17	63.4
Stream		183,138.50	6,467,476	148		113,374.97	4,003,800	92	56.6
TOTAL		468,986	16,562,095	380		467,702	16,516,743	379	1.0

In minus out 1284.2 m3
error % 0.27

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		342,727.34	12,103,303.05	277.85		281,306.47	9,934,245.11	228.06	49.8
Well						392,471.31	13,859,994.89	318.18	-318.2
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,441.41	7,007,893	161		41,967.43	1,482,066	34	126.9
Stream		395,880.97	13,980,406	321		219,999.78	7,769,220	178	142.6
TOTAL		938,322	33,136,522	761		935,745	33,045,525	759	2.1

In minus out 2576.8 m3
error % 0.27

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		494,962.25	17,479,428.52	401.27		427,696.97	15,103,977.31	346.74	54.5
Well						588,706.31	20,789,969.15	477.27	-477.3
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	297,603.13	10,509,756	241		62,777.80	2,216,977	51	190.4
Stream		613,414.06	21,662,515	497		324,864.13	11,472,469	263	233.9
TOTAL		1,407,887	49,719,080	1,141		1,404,045	49,583,393	1,138	3.1

In minus out 3842.2 m3
error % 0.27

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		970,243.19	34,263,817.99	786.59		892,889.63	31,532,102.45	723.88	62.7
Well						1,233,010.75	43,543,367.74	999.62	-999.6
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	603,357.44	21,307,369	489		126,604.52	4,470,997	103	386.5
Stream		1,327,716.13	46,887,857	1,076		644,840.63	22,772,334	523	553.6
TOTAL		2,905,186	102,595,675	2,355		2,897,346	102,318,801	2,349	6.4

In minus out 7840.2 m3
error % 0.27

Max in new wells

Proposed 5 cfs

1500 AF - Proposed Configuration with 5 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		221,710.52	7,829,633.69	179.74		129,964.98	4,589,670.26	105.36	74.4
Well						315,612.31	11,145,745	256	-255.9
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,314.80	3,507,270	81		20,651.04	729,284	17	63.8
Stream		252,311.83	8,910,309	205		106,878.27	3,774,371	87	117.9
TOTAL		**573,973**	**20,269,672**	**465**		**573,107**	**20,239,070**	**465**	0.7

In minus out 866.6 m3
error % 0.15

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		385,933.16	13,629,102.06	312.88		276,314.22	9,757,945.45	224.01	88.9
Well						621,412.06	21,944,961.92	503.79	-503.8
Underflow	Well	1,272.00	44,920.31	1.03					1.0
	GHB	198,553.97	7,011,868	161		40,841.77	1,442,313	33	127.9
Stream		559,123.63	19,745,266	453		204,344.52	7,216,359	166	287.6
TOTAL		**1,144,883**	**40,431,157**	**928**		**1,142,913**	**40,361,580**	**927**	1.6

In minus out 1970.1 m3
error % 0.17

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		543,568.88	19,195,955.44	440.68		427,084.06	15,082,332.73	346.24	94.4
Well						920,670.50	32,513,174.89	746.40	-746.4
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	297,806.69	10,516,945	241		60,962.89	2,152,885	49	192.0
Stream		869,272.31	30,698,065	705		300,711.94	10,619,543	244	460.9
TOTAL		**1,712,556**	**60,478,346**	**1,388**		**1,709,429**	**60,367,935**	**1,386**	2.5

In minus out 3126.4 m3
error % 0.18

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,017,688.44	35,939,331.33	825.05		894,133.63	31,576,033.90	724.89	100.2
Well						1,849,515.63	65,315,033.96	1,499.43	-1499.4
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	603,857.25	21,325,020	490		122,787.04	4,336,184	100	390.0
Stream		1,843,416.50	65,099,645	1,494		595,578.25	21,032,649	483	1011.6
TOTAL		**3,468,831**	**122,500,628**	**2,812**		**3,462,015**	**122,259,901**	**2,807**	5.5

In minus out 6816.5 m3
error % 0.20

Max in new wells

Proposed 5 cfs

2000 AF - Proposed Configuration with 5 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		212,827.17	7,515,921.34	172.54		86,569.03	3,057,156.77	70.18	102.4
Well						405,553.63	14,321,992	329	-328.8
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,369.94	3,509,217	81		20,350.79	718,682	16	64.1
Stream		304,691.78	10,760,090	247		104,439.98	3,688,263	85	162.3
TOTAL		**617,525**	**21,807,688**	**501**		**616,913**	**21,786,094**	**500**	0.5

In minus out 611.4 m3
error % 0.10

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		341,410.66	12,056,804.66	276.79		182,604.92	6,448,632.56	148.04	128.7
Well						819,283.88	28,932,739.68	664.20	-664.2
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	198,864.67	7,022,840	161		40,098.28	1,416,058	33	128.7
Stream		700,530.94	24,739,019	568		198,449.36	7,008,174	161	407.0
TOTAL		**1,242,078**	**43,863,584**	**1,007**		**1,240,436**	**43,805,603**	**1,006**	1.3

In minus out 1647.9 m3
error % 0.13

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		453,284.28	16,007,584.81	367.48		281,754.44	9,950,064.98	228.42	139.1
Well						1,233,012.13	43,543,416.30	999.62	-999.6
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	298,442.25	10,539,390	242		59,698.87	2,108,246	48	193.6
Stream		1,114,210.63	39,347,981	903		290,530.75	10,259,998	236	667.8
TOTAL		**1,867,845**	**65,962,335**	**1,514**		**1,864,996**	**65,861,725**	**1,512**	2.3

In minus out 2849.0 m3
error % 0.15

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		757,305.94	26,744,009.27	613.96		579,598.63	20,468,334.17	469.89	144.1
Well						2,466,019.00	87,086,647.20	1,999.23	-1999.2
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	605,459.69	21,381,609	491		120,003.48	4,237,883	97	393.6
Stream		2,379,114.75	84,017,652	1,929		573,193.81	20,242,150	465	1464.1
TOTAL		**3,745,749**	**132,279,902**	**3,037**		**3,738,815**	**132,035,015**	**3,031**	5.6

In minus out 6934.8 m3
error % 0.19

Max in new wells

Proposed 5 cfs

2285 AF - Proposed Configuration with 5 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		205,268.19	7,248,978.30	166.41		59,079.52	2,086,373.87	47.90	118.5
Well						470,965.28	16,631,983	382	-381.8
Underflow	Well	636.00	22,460	1					0.5
	GHB	99,464.43	3,512,554	81		20,143.55	711,363	16	64.3
Stream		344,494.50	12,165,710	279		99,456.51	3,512,274	81	198.7
TOTAL		649,863	22,949,702	527		649,645	22,941,994	527	0.2

In minus out 218.2 m3
error % 0.03

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		305,663.38	10,794,401.22	247.81		122,761.63	4,335,286.55	99.52	148.3
Well						941,931.38	33,263,995.67	763.64	-763.6
Underflow	Well	1,272.00	44,920.26	1.03					1.0
	GHB	199,165.55	7,033,466	161		39,662.71	1,400,675	32	129.3
Stream		787,060.25	27,794,773	638		187,378.02	6,617,193	152	486.2
TOTAL		1,293,161	45,667,560	1,048		1,291,734	45,617,150	1,047	1.2

In minus out 1427.5 m3
error % 0.11

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		378,070.66	13,351,440.46	306.51		185,245.00	6,541,866.04	150.18	156.3
Well						1,399,810.38	49,433,841.46	1,134.84	-1134.8
Underflow	Well	1,908.00	67,380.39	1.55					1.5
	GHB	298,936.94	10,556,859	242		59,039.75	2,084,969	48	194.5
Stream		1,241,573.00	43,845,741	1,007		273,363.72	9,653,750	222	784.9
TOTAL		1,920,489	67,821,421	1,557		1,917,459	67,714,426	1,555	2.5

In minus out 3029.6 m3
error % 0.16

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		558,657.75	19,728,814.08	452.91		357,743.94	12,633,609.10	290.03	162.9
Well						2,817,607.25	99,502,870.22	2,284.27	-2284.3
Underflow	Well	3,868.97	136,631.55	3.14					3.1
	GHB	606,671.00	21,424,386	492		118,486.96	4,184,328	96	395.8
Stream		2,674,561.50	94,451,257	2,168		541,687.38	19,129,511	439	1729.1
TOTAL		3,843,759	135,741,089	3,116		3,835,526	135,450,318	3,110	6.7

In minus out 8233.8 m3
error % 0.21

1000 AF - Current Configuration with 0 cfs flow in river

Current 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		314,385.16	11,102,408.05	254.88		163,658.78	5,779,555.85	132.68	122.2
Well						201,495.91	7,115,761	163	-163.4
Underflow	Well	636.00	22,460	1					0.5
	GHB	73,712.09	2,603,118	60		21,842.71	771,368	18	42.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**388,733**	**13,727,986**	**315**		**386,997**	**13,666,685**	**314**	1.4

In minus out 1735.8 m3
error % 0.45

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		634,176.19	22,395,722.78	514.14		322,892.06	11,402,826.63	261.77	252.4
Well						403,019.31	14,232,494	327	-326.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	138,321.08	4,884,763	112		44,298.89	1,564,401	36	76.2
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**773,769**	**27,325,406**	**627**		**770,210**	**27,199,721**	**624**	2.9

In minus out 3559 m3
error % 0.46

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		953,969.94	33,689,133.53	773.40		478,925.66	16,913,101.51	388.27	385.1
Well						604,324.13	21,341,507	490	-489.9
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	199,768.39	7,054,755	162		67,019.83	2,366,783	54	107.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,155,646**	**40,811,269**	**937**		**1,150,270**	**40,621,392**	**933**	4.4

In minus out 5376.8 m3
error % 0.47

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,940,870.88	68,541,214.46	1,573.49		966,426.44	34,129,030.72	783.49	790.0
Well						1,217,396.75	42,991,964	987	-987.0
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	386,727.56	13,657,156	314		136,861.98	4,833,236	111	202.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,331,467**	**82,335,002**	**1,890**		**2,320,685**	**81,954,231**	**1,881**	8.7

In minus out 10782.2 m3
error % 0.46

1500 AF - Current Configuration with 0 cfs flow in river

Current 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		449,798.97	15,884,502.15	364.66		195,177.77	6,892,638.38	158.23	206.4
Well						305,092.28	10,774,233	247	-247.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	73,468.18	2,594,505	60		21,897.79	773,313	18	41.8
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**523,903**	**18,501,467**	**425**		**522,168**	**18,440,185**	**423**	1.4

In minus out 1735.3 m3
error % 0.33

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		905,684.75	31,983,958.07	734.25		387,269.66	13,676,300.11	313.96	420.3
Well						609,966.00	21,540,748	495	-494.5
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	138,207.36	4,880,747	112		44,371.39	1,566,961	36	76.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,045,164**	**36,909,626**	**847**		**1,041,607**	**36,784,009**	**844**	2.9

In minus out 3557.1 m3
error % 0.34

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,363,042.50	48,135,396.08	1,105.04		581,687.75	20,542,110.93	471.58	633.5
Well						911,248.56	32,180,442	739	-738.8
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	200,357.69	7,075,566	162		67,069.11	2,368,523	54	108.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,565,308**	**55,278,342**	**1,269**		**1,560,005**	**55,091,077**	**1,265**	4.3

In minus out 5302.8 m3
error % 0.34

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,656,477.50	93,812,626.27	2,153.64		1,166,549.63	41,196,315.05	945.74	1207.9
Well						1,740,542.00	61,466,666	1,411	-1411.1
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	393,651.69	13,901,679	319		136,556.75	4,822,457	111	208.4
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**3,053,998**	**107,850,937**	**2,476**		**3,043,648**	**107,485,438**	**2,468**	8.4

In minus out 10349.8 m3
error % 0.34

2000 AF - Current Configuration with 0 cfs flow in river

Current 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		392,501.25	13,861,052.12	318.21		37,615.16	1,328,366.83	30.50	287.7
Well						405,659.09	14,325,717	329	-328.9
Underflow	Well	636.00	22,460	1					0.5
	GHB	73,718.59	2,603,348	60		21,842.51	771,361	18	42.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		466,856	16,486,860	378		465,117	16,425,445	377	1.4

In minus out 1739.1 m3
error % 0.37

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		764,480.88	26,997,389.82	619.77		45,275.98	1,598,906.31	36.71	583.1
Well						811,319.06	28,651,465	658	-657.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	138,676.09	4,897,300	112		44,281.33	1,563,780	36	76.5
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		904,429	31,939,611	733		900,876	31,814,152	730	2.9

In minus out 3552.6 m3
error % 0.39

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,131,755.13	39,967,558.76	917.53		45,952.31	1,622,790.61	37.25	880.3
Well						1,216,976.00	42,977,106	987	-986.6
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	201,508.80	7,116,217	163		66,920.27	2,363,267	54	109.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		1,335,172	47,151,156	1,082		1,329,849	46,963,164	1,078	4.3

In minus out 5323.2 m3
error % 0.40

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,256,351.00	79,682,290.97	1,829.25		48,293.27	1,705,461.01	39.15	1790.1
Well						2,467,758.50	87,148,077	2,001	-2000.6
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	402,078.59	14,199,273	326		135,951.02	4,801,065	110	215.8
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		2,662,299	94,018,195	2,158		2,652,003	93,654,603	2,150	8.3

In minus out 10295.8 m3
error % 0.39

2285 AF - Current Configuration with 0 cfs flow in river

Current 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		449,137.38	15,861,138.18	364.12		36,951.22	1,304,920.24	29.96	334.2
Well						462,960.00	16,349,280	375	-375.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	73,724.70	2,603,563	60		21,842.17	771,349	18	42.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**523,498**	**18,487,162**	**424**		**521,753**	**18,425,549**	**423**	1.4

In minus out 1744.7 m3
error % 0.33

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		877,226.31	30,978,957.74	711.18		43,570.09	1,538,663.21	35.32	675.9
Well						925,920.00	32,698,559	751	-750.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	138,819.00	4,902,347	113		44,274.37	1,563,535	36	76.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,017,317**	**35,926,225**	**825**		**1,013,764**	**35,800,757**	**822**	2.9

In minus out 3552.9 m3
error % 0.35

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,301,037.00	45,945,692.31	1,054.77		44,026.65	1,554,786.56	35.69	1019.1
Well						1,388,880.00	49,047,839	1,126	-1126.0
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	202,147.98	7,138,789	164		66,883.64	2,361,974	54	109.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,505,093**	**53,151,862**	**1,220**		**1,499,790**	**52,964,599**	**1,216**	4.3

In minus out 5302.8 m3
error % 0.35

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,547,399.75	89,960,581.53	2,065.21		64,291.74	2,270,441.66	52.12	2013.1
Well						2,748,404.75	97,059,007	2,228	-2228.2
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	407,257.38	14,382,160	330		135,667.97	4,791,070	110	220.2
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,958,526**	**104,479,373**	**2,399**		**2,948,364**	**104,120,518**	**2,390**	8.2

In minus out 10161.5 m3
error % 0.34

2800 AF - Current Configuration with 0 cfs flow in river

Current 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		686,726.69	24,251,526.35	556.74		175,744.08	6,206,344.12	142.48	414.3
Well						561,744.69	19,837,828	455	-455.4
Underflow	Well	636.00	22,460	1					0.5
	GHB	73,717.44	2,603,307	60		21,842.52	771,361	18	42.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**761,080**	**26,877,293**	**617**		**759,331**	**26,815,534**	**616**	1.4

In minus out 1748.8 m3
error % 0.23

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,355,947.75	47,884,847.33	1,099.28		357,176.28	12,613,562.51	289.57	809.7
Well						1,091,065.75	38,530,627	885	-884.5
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	138,832.94	4,902,839	113		44,274.02	1,563,522	36	76.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,496,053**	**52,832,607**	**1,213**		**1,492,516**	**52,707,712**	**1,210**	2.9

In minus out 3536.8 m3
error % 0.24

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,962,090.50	69,290,578.52	1,590.69		557,308.69	19,681,172.39	451.82	1138.9
Well						1,537,049.00	54,280,378	1,246	-1246.1
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	202,504.61	7,151,383	164		66,865.06	2,361,318	54	110.0
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,166,503**	**76,509,342**	**1,756**		**2,161,223**	**76,322,868**	**1,752**	4.3

In minus out 2580.2 m3
error % 0.26

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		3,506,302.00	###########	2,842.61		1,134,127.88	40,051,351.64	919.45	1923.2
Well						2,643,189.75	93,343,374	2,143	-2142.9
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	412,602.06	14,570,906	335		135,388.56	4,781,202	110	224.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**3,922,773**	**138,531,435**	**3,180**		**3,912,706**	**138,175,928**	**3,172**	8.2

In minus out 10066.8 m3
error % 0.26

1000 AF - Proposed Configuration with 0 cfs flow in river

Proposed 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		315,368.84	11,137,146.65	255.67		166,806.72	5,890,724.23	135.23	120.4
Well						201,495.91	7,115,761	163	-163.4
Underflow	Well	636.00	22,460	1					0.5
	GHB	74,929.09	2,646,096	61		21,773.87	768,937	18	43.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		390,934	13,805,703	317		390,076	13,775,423	316	0.7

In minus out 857.4 m3
error % 0.22

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		639,079.13	22,568,868.40	518.11		336,168.31	11,871,673.02	272.54	245.6
Well						403,019.31	14,232,494	327	-326.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	144,582.92	5,105,898	117		43,866.09	1,549,116	36	81.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		784,934	27,719,687	636		783,054	27,653,283	635	1.5

In minus out 1880 m3
error % 0.24

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		964,971.13	34,077,636.84	782.31		507,213.63	17,912,081.79	411.20	371.1
Well						604,324.13	21,341,507	490	-489.9
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	213,426.80	7,537,097	173		65,807.42	2,323,967	53	119.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		1,180,306	41,682,114	957		1,177,345	41,577,556	954	2.4

In minus out 2960.8 m3
error % 0.25

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,983,443.88	70,044,665.91	1,608.00		1,047,020.00	36,975,165.78	848.83	759.2
Well						1,232,848.63	43,537,642	999	-999.5
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	428,945.66	15,148,074	348		129,940.84	4,588,818	105	242.4
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		2,416,259	85,329,372	1,959		2,409,809	85,101,626	1,954	5.2

In minus out 6449 m3
error % 0.27

1500 AF - Proposed Configuration with 0 cfs flow in river

Proposed 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		405,856.59	14,332,691.68	329.03		145,125.09	5,125,044.80	117.65	211.4
Well						315,612.31	11,145,745	256	-255.9
Underflow	Well	636.00	22,460	1					0.5
	GHB	77,645.87	2,742,038	63		21,646.70	764,446	18	45.4
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**484,138**	**17,097,190**	**392**		**482,384**	**17,035,235**	**391**	1.4

In minus out 1754.4 m3
error % 0.36

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		793,237.75	28,012,929.37	643.09		287,186.91	10,141,910.82	232.83	410.3
Well						621,412.06	21,944,962	504	-503.8
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	160,894.39	5,681,932	130		43,061.08	1,520,688	35	95.5
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**955,404**	**33,739,782**	**775**		**951,660**	**33,607,561**	**772**	3.0

In minus out 3744.1 m3
error % 0.39

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,166,457.13	41,193,048.44	945.66		430,234.63	15,193,593.80	348.80	596.9
Well						920,670.50	32,513,175	746	-746.4
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	252,101.45	8,902,880	204		63,758.63	2,251,615	52	152.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,420,467**	**50,163,308**	**1,152**		**1,414,664**	**49,958,384**	**1,147**	4.7

In minus out 5802.9 m3
error % 0.41

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,276,221.00	80,383,993.46	1,845.36		868,192.19	30,659,920.60	703.85	1141.5
Well						1,847,233.50	65,234,441	1,498	-1497.6
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	568,243.31	20,067,325	461		120,931.39	4,270,652	98	362.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,848,333**	**100,587,950**	**2,309**		**2,836,357**	**100,165,014**	**2,299**	9.7

In minus out 11976.2 m3
error % 0.42

2000 AF - Proposed Configuration with 0 cfs flow in river

Proposed 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		368,438.31	13,011,277.42	298.70		15,867.46	560,354.18	12.86	285.8
Well						405,659.09	14,325,717	329	-328.9
Underflow	Well	636.00	22,460	1					0.5
	GHB	75,908.32	2,680,677	62		21,725.80	767,239	18	43.9
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**444,983**	**15,714,415**	**361**		**443,252**	**15,653,311**	**359**	1.4

In minus out 1730.3 m3
error % 0.39

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		722,246.13	25,505,883.56	585.53		16,213.15	572,562.19	13.14	572.4
Well						811,319.06	28,651,465	658	-657.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	150,958.67	5,331,056	122		43,474.95	1,535,304	35	87.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**874,477**	**30,881,860**	**709**		**871,007**	**30,759,331**	**706**	2.8

In minus out 3469.6 m3
error % 0.40

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,071,978.75	37,856,575.80	869.07		16,264.58	574,378.21	13.19	855.9
Well						1,216,976.00	42,977,106	987	-986.6
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	229,271.53	8,096,648	186		64,616.38	2,281,906	52	133.5
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,303,158**	**46,020,605**	**1,056**		**1,297,857**	**45,833,390**	**1,052**	4.3

In minus out 5,301.20
error % 0.41

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,123,822.50	75,002,090.73	1,721.81		17,175.23	606,537.53	13.92	1707.9
Well						2,467,758.50	87,148,077	2,001	-2000.6
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	491,194.09	17,346,357	398		123,049.38	4,345,448	100	298.5
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,618,886**	**92,485,080**	**2,123**		**2,607,983**	**92,100,063**	**2,114**	8.8

In minus out 10902.5 m3
error % 0.42

2285 AF - Proposed Configuration with 0 cfs flow in river

Proposed 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		424,524.78	14,991,952.56	344.17		15,035.67	530,979.65	12.19	332.0
Well						462,960.00	16,349,280	375	-375.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	76,271.03	2,693,486	62		21,708.99	766,646	18	44.2
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**501,432**	**17,707,899**	**407**		**499,705**	**17,646,905**	**405**	1.4

In minus out 1727.2 m3
error % 0.35

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		833,712.94	29,442,297.26	675.90		15,309.22	540,640.01	12.41	663.5
Well						925,920.00	32,698,559	751	-750.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	153,149.64	5,408,429	124		43,377.65	1,531,867	35	89.0
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**988,135**	**34,895,647**	**801**		**984,607**	**34,771,067**	**798**	2.9

In minus out 3527.7 m3
error % 0.36

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,237,686.63	43,708,494.73	1,003.41		15,377.99	543,068.48	12.47	990.9
Well						1,388,880.00	49,047,839	1,126	-1126.0
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	234,461.86	8,279,943	190		64,388.78	2,273,868	52	137.9
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,474,056**	**52,055,818**	**1,195**		**1,468,647**	**51,864,776**	**1,191**	4.4

In minus out 5409.8 m3
error % 0.37

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,451,811.25	86,584,905.20	1,987.72		16,636.62	587,516.65	13.49	1974.2
Well						2,816,340.00	99,458,118	2,283	-2283.2
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	510,733.78	18,036,395	414		122,295.52	4,318,826	99	314.9
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,966,414**	**104,757,932**	**2,405**		**2,955,272**	**104,364,460**	**2,396**	9.0

In minus out 11141.8 m3
error % 0.38

2800 AF - Proposed Configuration with 0 cfs flow in river

Proposed 0 cfs

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		722,292.56	25,507,523.49	585.57		208,241.66	7,353,985.37	168.82	416.7
Well						566,576.19	20,008,451	459	-459.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	75,371.73	2,661,728	61		21,752.92	768,197	18	43.5
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**798,300**	**28,191,712**	647		**796,571**	**28,130,634**	646	1.4

In minus out 1729.6 m3
error % 0.22

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,462,165.00	51,635,874.46	1,185.40		437,438.91	15,448,010.62	354.64	830.8
Well						1,128,323.63	39,846,376	915	-914.7
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	149,362.38	5,274,683	121		43,594.21	1,539,515	35	85.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,612,799**	**56,955,478**	**1,308**		**1,609,357**	**56,833,902**	**1,305**	2.8

In minus out 3442.6 m3
error % 0.21

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,164,646.50	76,443,776.81	1,754.91		682,663.38	24,108,031.81	553.44	1201.5
Well						1,641,050.75	57,953,166	1,330	-1330.4
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	227,285.03	8,026,496	184		64,893.03	2,291,676	53	131.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,393,840**	**84,537,653**	**1,941**		**2,388,607**	**84,352,873**	**1,936**	4.2

In minus out 5232.2 m3
error % 0.22

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		4,058,842.50	143,336,683.47	3,290.56		1,409,849.50	49,788,369.84	1,142.98	2147.6
Well						3,013,933.00	106,436,049	2,443	-2443.4
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	495,895.50	17,512,386	402		124,081.30	4,381,890	101	301.4
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**4,558,607**	**160,985,701**	**3,696**		**4,547,864**	**160,606,309**	**3,687**	8.7

In minus out 10743.0 m3
error % 0.24

Max in new wells

Proposed 0 cfs

1000 AF - Proposed Configuration with 0 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		300,372.63	10,607,560.13	243.52		157,117.20	5,548,542.18	127.38	116.1
Well						196,235.67	6,929,998	159	-159.1
Underflow	Well	636.00	22,460	1					0.5
	GHB	75,807.59	2,677,120	61		21,730.08	767,391	18	43.8
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**376,816**	**13,307,140**	**305**		**375,083**	**13,245,931**	**304**	1.4

In minus out 1733.2 m3
error % 0.46

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		593,314.25	20,952,696.95	481.01		305,086.84	10,774,041.21	247.34	233.7
Well						392,471.31	13,859,995	318	-318.2
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	149,988.05	5,296,778	122		43,527.52	1,537,160	35	86.3
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**744,574**	**26,294,396**	**604**		**741,086**	**26,171,196**	**601**	2.8

In minus out 3488.6 m3
error % 0.47

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		878,741.00	31,032,448.43	712.41		450,203.56	15,898,790.24	364.99	347.4
Well						586,334.25	20,706,201	475	-475.3
Underflow	Well	1,900.31	67,109	2					1.5
	GHB	225,714.25	7,971,024	183		64,534.93	2,279,030	52	130.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,106,356**	**39,070,582**	**897**		**1,101,073**	**38,884,020**	**893**	4.3

In minus out 5282.8 m3
error % 0.48

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,793,598.50	63,340,339.14	1,454.09		908,252.38	32,074,632.90	736.33	717.8
Well						1,233,010.75	43,543,368	1,000	-999.6
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	478,859.22	16,910,755	388		124,025.36	4,379,915	101	287.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**2,276,327**	**80,387,726**	**1,845**		**2,265,288**	**79,997,915**	**1,836**	8.9

In minus out 11038.2 m3
error % 0.49

Max in new wells

Proposed 0 cfs

1500 AF - Proposed Configuration with 0 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		456,293.47	16,113,853.27	369.92		203,469.08	7,185,443.35	164.96	205.0
Well						305,092.28	10,774,233	247	-247.3
Underflow	Well	636.00	22,460	1					0.5
	GHB	75,128.79	2,653,148	61		21,761.94	768,516	18	43.3
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**532,058**	**18,789,462**	**431**		**530,323**	**18,728,192**	**430**	1.4

In minus out 1734.9 m3
error % 0.33

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		929,260.44	32,816,525.69	753.36		419,597.09	14,817,932.90	340.17	413.2
Well						609,966.00	21,540,748	495	-494.5
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	146,254.58	5,164,932	119		43,742.21	1,544,742	35	83.1
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,076,787**	**38,026,378**	**873**		**1,073,305**	**37,903,423**	**870**	2.8

In minus out 3781.8 m3
error % 0.32

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,407,680.00	49,711,754.67	1,141.22		641,858.19	22,667,010.08	520.36	620.9
Well						914,948.13	32,311,091	742	-741.8
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	217,810.98	7,691,923	177		65,405.08	2,309,759	53	123.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,627,399**	**57,471,058**	**1,319**		**1,622,211**	**57,287,860**	**1,315**	4.2

In minus out 5187.6 m3
error % 0.32

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,840,355.75	100,306,225.99	2,302.71		1,324,501.38	46,774,328.97	1,073.79	1228.9
Well						1,830,510.50	64,643,874	1,484	-1484.0
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	448,366.19	15,833,904	363		127,375.70	4,498,231	103	260.2
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**3,292,591**	**116,276,761**	**2,669**		**3,282,388**	**115,916,434**	**2,661**	8.3

In minus out 10203.5 m3
error % 0.31

Max in new wells

Proposed 0 cfs

2000 AF - Proposed Configuration with 0 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		452,887.22	15,993,562.68	367.16		103,479.50	3,654,344.39	83.89	283.3
Well						405,553.63	14,321,992	329	-328.8
Underflow	Well	636.00	22,460	1					0.5
	GHB	78,891.58	2,786,030	64		21,590.66	762,467	18	46.5
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**532,415**	**18,802,053**	**432**		**530,624**	**18,738,804**	**430**	1.5

In minus out 1791.0 m3
error % 0.34

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		893,940.44	31,569,211.55	724.73		197,372.11	6,970,130.91	160.01	564.7
Well						819,283.88	28,932,740	664	-664.2
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	168,073.78	5,935,470	136		42,781.34	1,510,809	35	101.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,063,286**	**37,549,602**	**862**		**1,059,437**	**37,413,680**	**859**	3.1

In minus out 3848.9 m3
error % 0.36

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,321,374.75	46,663,913.24	1,071.26		290,683.53	10,265,392.98	235.66	835.6
Well						1,233,012.13	43,543,416	1,000	-999.6
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	269,412.69	9,514,220	218		63,065.14	2,227,125	51	167.3
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**1,592,695**	**56,245,514**	**1,291**		**1,586,761**	**56,035,934**	**1,286**	4.8

In minus out 5934.6 m3
error % 0.37

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,502,413.25	88,371,898.13	2,028.74		557,550.81	19,689,722.95	452.01	1576.7
Well						2,452,755.50	86,618,251	1,988	-1988.5
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	633,616.50	22,375,958	514		117,789.92	4,159,712	95	418.2
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		**3,139,899**	**110,884,487**	**2,546**		**3,128,096**	**110,467,686**	**2,536**	9.6

In minus out 11802.5 m3
error % 0.38

Max in new wells

Proposed 0 cfs

2285 AF - Proposed Configuration with 0 cfs flow in river

After 60 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		485,928.75	17,160,413.45	393.95		72,110.68	2,546,564.86	58.46	335.5
Well						470,965.28	16,631,983	382	-381.8
Underflow	Well	636.00	22,460	1					0.5
	GHB	79,867.03	2,820,478	65		21,548.29	760,971	17	47.3
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		566,432	20,003,351	459		564,624	19,939,519	458	1.5

In minus out 1807.6 m3
error % 0.32

After 120 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		943,322.06	33,313,107.34	764.76		129,853.53	4,585,734.61	105.27	659.5
Well						941,931.38	33,263,996	764	-763.6
Underflow	Well	1,272.00	44,920	1					1.0
	GHB	173,619.95	6,131,331	141		42,550.89	1,502,671	34	106.3
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		1,118,214	39,489,359	907		1,114,336	39,352,401	903	3.1

In minus out 3878.2 m
error % 0.35

After 180 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		1,321,282.50	46,660,655.46	1,071.18		201,996.03	7,133,423.19	163.76	907.4
Well						1,334,400.38	47,123,909	1,082	-1081.8
Underflow	Well	1,908.00	67,380	2					1.5
	GHB	281,798.16	9,951,609	228		62,578.20	2,209,929	51	177.7
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		1,604,989	56,679,645	1,301		1,598,975	56,467,261	1,296	4.9

In minus out 6014.0 m3
error % 0.38

After 365 Days

		In m3	In ft3	In AF		Out m3	Out ft3	Out AF	Difference
Storage		2,109,313.25	74,489,701.35	1,710.05		398,855.38	14,085,445.95	323.36	1386.7
Well						2,234,328.00	78,904,556	1,811	-1811.4
Underflow	Well	3,868.97	136,632	3					3.1
	GHB	649,486.94	22,936,417	527		117,066.61	4,134,169	95	431.6
Stream		0.00	0	0		0.00	0	0	0.0
TOTAL		2,762,669	97,562,750	2,240		2,750,250	97,124,171	2,230	10.1

In minus out 12419.2 m3
error % 0.45

ATTACHMENT 3

Comparative Hydrographs

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
1/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
1/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
1/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
1/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
1/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
1/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
1/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
1/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
1/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
1/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
1/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
1/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
1/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
1/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
1/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
1/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
1/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
1/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
1/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
1/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
1/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
1/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
1/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
1/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
1/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
1/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
1/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
1/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
1/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
1/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
1/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
2/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
2/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
2/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
2/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
2/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
2/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
2/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
2/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
2/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
2/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
2/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
2/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
2/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
2/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
2/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
2/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
2/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
2/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
2/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
2/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
2/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
2/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
2/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
2/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
2/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
2/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
2/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
2/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
3/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
3/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
3/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
3/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
3/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
3/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
3/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
3/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
3/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
3/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
3/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
3/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
3/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
3/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
3/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
3/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
3/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
3/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
3/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
3/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
3/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
3/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
3/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
3/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
3/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
3/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
3/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
3/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
3/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
3/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
3/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
4/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
4/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
4/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
4/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
4/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
4/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
4/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
4/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
4/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
4/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
4/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
4/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
4/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
4/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
4/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
4/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
4/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
4/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
4/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
4/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
4/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
4/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
4/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
4/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
4/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
4/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
4/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
4/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
4/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
4/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
5/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
5/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
5/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
5/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
5/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
5/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
5/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
5/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
5/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
5/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
5/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
5/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
5/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
5/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
5/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
5/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
5/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
5/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
5/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
5/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
5/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
5/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
5/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
5/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
5/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
5/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
5/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
5/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
5/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
5/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
5/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
6/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
6/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
6/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
6/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
6/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
6/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
6/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
6/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
6/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
6/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
6/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
6/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
6/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
6/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
6/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
6/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
6/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
6/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
6/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
6/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
6/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
6/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
6/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
6/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
6/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
6/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
6/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
6/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
6/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
6/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
7/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
7/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
7/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
7/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
7/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
7/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
7/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
7/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
7/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
7/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
7/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
7/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
7/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
7/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
7/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
7/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
7/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
7/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
7/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
7/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
7/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
7/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
7/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
7/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
7/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
7/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
7/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
7/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
7/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
7/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
7/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
8/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
8/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
8/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
8/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
8/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
8/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
8/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
8/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
8/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
8/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
8/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
8/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
8/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
8/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
8/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
8/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
8/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
8/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
8/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
8/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
8/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
8/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
8/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
8/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
8/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
8/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
8/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
8/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
8/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
8/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
8/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
9/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
9/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
9/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
9/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
9/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
9/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
9/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
9/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
9/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
9/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
9/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
9/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
9/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
9/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
9/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
9/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
9/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
9/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
9/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
9/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
9/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
9/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
9/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
9/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
9/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
9/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
9/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
9/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
9/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
9/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
10/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
10/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
10/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
10/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
10/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
10/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
10/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
10/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
10/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
10/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
10/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
10/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
10/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
10/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
10/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
10/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
10/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
10/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
10/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
10/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
10/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
10/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
10/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
10/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
10/25/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
10/26/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
10/27/2005	0	0	0	0	0	0	0	0	0	270	0	250		520	0.749	2.30
10/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
10/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
10/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
10/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
11/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
11/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
11/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
11/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
11/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
11/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
11/7/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21
11/8/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21

1000 Acre-Feet

rated gpm	275	340	260	365	340	370	370	360	320	270	260	250	84.75			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1000.13	total gpm	MGD	AF
11/9/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21
11/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
11/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
11/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
11/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
11/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
11/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
11/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
11/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
11/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
11/19/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
11/20/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
11/21/2005	275	0	0	0	0	0	0	0	0	270	0	0		545	0.785	2.41
11/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
11/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
11/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
11/25/2005	0	0	0	0	340	0	0	0	0	0	0	250		590	0.850	2.61
11/26/2005	0	0	0	0	340	0	0	0	0	0	0	250		590	0.850	2.61
11/27/2005	0	0	0	0	340	0	0	0	0	0	0	250		590	0.850	2.61
11/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
11/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
11/30/2005	0	0	0	365	0	0	0	360	0	0	0	0		725	1.045	3.21
12/1/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
12/2/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
12/3/2005	0	340	0	0	0	0	0	0	320	0	0	0		660	0.951	2.92
12/4/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
12/5/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
12/6/2005	275	0	0	0	0	0	370	0	0	0	0	0		645	0.929	2.85
12/7/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
12/8/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
12/9/2005	0	0	0	365	0	0	0	0	0	270	0	0		635	0.915	2.81
12/10/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
12/11/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
12/12/2005	0	0	260	0	340	0	0	0	0	0	0	0		600	0.865	2.65
12/13/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/14/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/15/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/16/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
12/17/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
12/18/2005	0	0	0	0	0	0	0	360	320	0	0	0		680	0.980	3.01
12/19/2005	275	0	0	0	340	0	0	0	0	0	0	0		615	0.886	2.72
12/20/2005	275	0	0	0	340	0	0	0	0	0	0	0		615	0.886	2.72
12/21/2005	275	0	0	0	340	0	0	0	0	0	0	0		615	0.886	2.72
12/22/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
12/23/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
12/24/2005	0	340	0	0	0	0	0	0	0	0	260	0		600	0.865	2.65
12/25/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/26/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/27/2005	0	0	0	0	0	370	0	0	0	0	0	250		620	0.893	2.74
12/28/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
12/29/2005	0	0	260	365	0	0	0	0	0	0	0	0		625	0.901	2.76
12/30/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
12/31/2005	0	0	0	0	340	0	0	360	0	0	0	0		700	1.009	3.10
	19800	24480	15340	21900	20060	14430	13320	20520	23040	25920	9360	18000		226170	325.893	1000.13
days	72	72	59	60	59	39	36	57	72	96	47	72				
	103680	103680	84960	86400	84960	56160	51840	82080	103680	138240	67392	103680				
MG	28.512	35.251	22.090	31.536	28.886	20.779	19.181	29.549	33.178	37.325	13.478	25.920				
AF	87.50	108.18	67.79	96.78	88.65	63.77	58.86	90.68	101.82	114.55	41.36	79.55	999.49			1000.13

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
1/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
1/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
1/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
1/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
1/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
1/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
1/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
1/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
1/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
1/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
1/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
1/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
1/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
1/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
1/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
1/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
1/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
1/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
1/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
1/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
1/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
2/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
2/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
2/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
2/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
2/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
2/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
2/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
2/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
2/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
2/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
2/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
2/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
2/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
2/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
2/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
2/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
2/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
2/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
2/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
3/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
3/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
3/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
3/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
3/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
3/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
3/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
3/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
3/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
3/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
3/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
3/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
3/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
3/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
3/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
3/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
3/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
3/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
3/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
4/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
4/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
4/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
4/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
4/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
4/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
4/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
4/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
4/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
4/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
4/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
4/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
4/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
4/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
4/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
4/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
4/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
4/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
4/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
4/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
5/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
5/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
5/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
5/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
5/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
5/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
5/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
5/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
5/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
5/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
5/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
5/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
5/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
5/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
5/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
5/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
5/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
5/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
6/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
6/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
6/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
6/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
6/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
6/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
6/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
6/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
6/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
6/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
6/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
6/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
6/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
6/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
6/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
6/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
6/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
6/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
6/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
6/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
7/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
7/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
7/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
7/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
7/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
7/14/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
7/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
7/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
7/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
7/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/22/2005	0	0	300	0	0	0	0	300	0	300		900	1.297	3.98
7/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
7/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
7/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
7/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
7/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
7/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
7/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
7/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
7/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
8/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
8/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
8/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
8/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
8/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
8/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
8/8/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
8/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
8/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
8/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
8/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
8/14/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
8/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
8/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
8/18/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
8/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
8/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
8/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
8/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
8/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
8/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
8/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
8/26/2005	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
8/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
8/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
8/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
8/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
8/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
9/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
9/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
9/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
9/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
9/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
9/8/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
9/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
9/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
9/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
9/14/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
9/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
9/18/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
9/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
9/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
9/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
9/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
9/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
9/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
9/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
9/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
9/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
9/30/2005	0	300	0	0	0	0	0	0	300	300		900	1.297	3.98
10/1/2005	300	0	300	0	0	0	0	0	0	300		900	1.297	3.98
10/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
10/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
10/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
10/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
10/8/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
10/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
10/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
10/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/13/2005	300	0	0	0	0	0	0	0	300	300		900	1.297	3.98
10/14/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
10/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
10/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
10/18/2005	0	300	0	0	0	0	0	300	0	300		900	1.297	3.98
10/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
10/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
10/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
10/24/2005	0	300	0	0	0	0	0	300	300	0		900	1.297	3.98
10/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
10/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
10/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
10/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
10/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
10/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
10/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
11/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
11/2/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
11/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
11/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
11/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
11/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
11/8/2005	0	300	0	0	0	0	0	300	300	0		900	1.297	3.98

1000 Acre-Feet
Maximum Usage
fromNew Wells

well gpm	300	300	300	300	300	300	300	300	300	300	1000.27			
Day	S-8	S-6	S-7	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
11/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
11/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
11/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
11/14/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
11/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
11/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
11/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
11/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
11/20/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
11/22/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
11/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
11/25/2005	0	0	300	0	0	0	0	0	300	300		900	1.297	3.98
11/26/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
11/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
11/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
11/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
11/30/2005	0	300	300	0	0	0	0	0	300	0		900	1.297	3.98
12/1/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
12/2/2005	0	300	0	0	0	0	0	300	300	0		900	1.297	3.98
12/3/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
12/4/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/5/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
12/6/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/7/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
12/8/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
12/9/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
12/10/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/11/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
12/12/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/13/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
12/14/2005	0	0	0	0	0	0	0	300	300	0		600	0.865	2.65
12/15/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
12/16/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/17/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
12/18/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
12/19/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
12/20/2005	300	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/21/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
12/22/2005	0	0	300	0	0	0	0	300	300	0		900	1.297	3.98
12/23/2005	300	0	0	0	0	0	0	0	0	300		600	0.865	2.65
12/24/2005	0	300	0	0	0	0	0	300	0	0		600	0.865	2.65
12/25/2005	0	0	300	0	0	0	0	0	300	0		600	0.865	2.65
12/26/2005	300	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/27/2005	0	300	0	0	0	0	0	0	0	300		600	0.865	2.65
12/28/2005	0	0	300	0	0	0	0	300	0	0		600	0.865	2.65
12/29/2005	300	0	0	0	0	0	0	0	300	0		600	0.865	2.65
12/30/2005	0	300	0	0	0	0	0	0	300	0		600	0.865	2.65
12/31/2005	0	0	300	0	0	0	0	0	0	300		600	0.865	2.65
	36300	35700	36000	0	0	0	0	50400	33900	33900		226200	325.937	1000.27
days	132	105	138	0	0	0	0	187	170	136				
	190080	151200	199385	0	0	0	0	268800	244080	195264				
MG	52.272	51.408	51.840	####	0.000	0.000	0.000	72.576	48.816	48.816				
AF	160.42	157.77	159.09	0.00	0.00	0.00	0.00	222.73	149.81	149.81				1000.27
Day	S-8	S-7	S-6	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
1/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
1/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
1/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
1/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
1/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
1/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
1/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
1/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
1/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
1/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
1/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
1/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
1/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
2/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
2/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
2/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
2/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
2/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
2/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
2/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
2/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
2/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
2/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
3/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
3/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
3/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
3/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
3/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
3/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
3/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
3/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
3/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
3/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
3/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
3/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
3/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
4/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
4/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
4/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
4/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
4/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
4/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
4/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
4/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
4/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
4/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
4/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
4/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
5/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
5/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
5/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
5/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
5/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
5/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
5/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
5/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
5/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
5/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
5/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
5/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
5/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
6/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
6/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
6/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
6/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
6/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
6/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
6/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
6/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
6/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
6/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
6/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
6/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
6/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
6/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
6/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
7/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
7/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
7/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
7/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
7/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
7/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
7/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
7/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
7/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
7/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
7/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
7/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
7/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
8/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
8/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
8/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
8/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
8/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
8/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
8/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
8/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
8/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
8/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
8/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
8/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
8/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
9/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
9/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
9/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
9/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
9/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
9/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
9/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
9/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
9/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
9/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
9/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
9/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
10/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
10/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
10/9/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/10/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/11/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/12/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
10/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
10/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
10/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
10/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
10/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
10/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
10/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
10/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
10/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
10/31/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
11/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
11/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
11/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
11/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07

1500 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	127.69			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.62	total gpm	MGD	AF
11/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
11/9/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/10/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/11/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/12/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
11/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
11/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
11/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
11/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
11/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
11/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
11/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
11/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
11/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
11/28/2005	0	0	260	0	0	0	0	0	0	270	0	250		780	1.124	3.45
11/29/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
11/30/2005	0	0	260	0	0	0	370	0	0	270	0	0		900	1.297	3.98
12/1/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/2/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/3/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/4/2005	0	340	0	0	0	0	0	0	320	0	260	0		920	1.326	4.07
12/5/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/6/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/7/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/8/2005	275	0	0	0	340	0	0	360	0	0	0	0		975	1.405	4.31
12/9/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/10/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/11/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/12/2005	0	0	260	0	0	370	0	0	0	0	0	250		880	1.268	3.89
12/13/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/14/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/15/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/16/2005	0	340	0	0	0	0	370	0	0	270	0	0		980	1.412	4.33
12/17/2005	0	0	0	0	0	0	0	360	0	0	260	0		620	0.893	2.74
12/18/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
12/19/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
12/20/2005	0	0	260	0	0	0	0	360	0	0	260	0		880	1.268	3.89
12/21/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/22/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/23/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/24/2005	275	0	0	0	340	0	0	0	320	0	0	0		935	1.347	4.13
12/25/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
12/26/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
12/27/2005	0	0	0	365	0	370	0	0	0	0	0	250		985	1.419	4.36
12/28/2005	275	0	260	0	0	0	0	0	0	270	0	250		1055	1.520	4.67
12/29/2005	275	0	260	0	0	0	0	0	0	270	0	0		805	1.160	3.56
12/30/2005	275	0	260	0	0	0	0	0	0	270	0	0		805	1.160	3.56
12/31/2005	275	0	260	0	0	0	0	0	0	270	0	0		805	1.160	3.56
	27500	32640	22100	27740	32640	31080	27380	34560	30720	24030	24960	24000		339350	488.977	1500.62
days	100	96	85	76	96	84	74	96	96	89	125	96				
	144000	138240	122400	109440	138240	120960	106560	138240	138240	128160	179712	138240				
MG	39.600	47.002	31.824	39.946	47.002	44.755	39.427	49.766	44.237	34.603	35.942	34.560				
AF	121.53	144.24	97.66	122.59	144.24	137.35	121.00	152.73	135.76	106.19	110.30	106.06				1500.62

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
1/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/5/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/6/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
1/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
1/21/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/22/2005	275	0	260	0	300	0	0	300	0	0	0	250		1385	1.996	6.12
1/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
1/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
1/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
1/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
1/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
2/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
2/17/2005	0	300	0	0	0	0	0	0	300	0	280	0		860	1.239	3.80
2/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
2/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
2/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
2/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
3/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
3/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
3/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
3/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
3/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
3/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
3/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
4/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
4/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
4/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
4/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
4/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
4/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
5/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
5/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
5/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
5/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
5/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
5/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
5/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
6/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
6/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
6/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
6/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
6/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
6/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
6/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
7/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
7/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.83
7/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
7/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
7/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
7/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
7/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
7/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
7/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
7/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
8/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
8/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
8/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.83
8/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
8/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
8/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
8/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
8/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80

1500 Acre-Feet
Zero Flow Configuration

Well gpm	275	300	260	300	300	300	300	300	300	270	260	250	131.51			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17	1500.93	total gpm	MGD	AF
11/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
11/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
11/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
11/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
11/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
11/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
12/1/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/2/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/3/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/4/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/5/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/6/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/7/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/8/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/9/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/10/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/11/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/12/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/13/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/14/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/15/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/16/2005	0	0	260	0	0	0	300	0	0	0	260	0		820	1.182	3.63
12/17/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/18/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/19/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/20/2005	0	300	0	0	0	0	0	0	300	0	260	0		860	1.239	3.80
12/21/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/22/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/23/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/24/2005	275	0	0	0	300	0	0	300	0	0	0	250		1125	1.621	4.97
12/25/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/26/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/27/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/28/2005	0	0	0	300	0	300	0	0	0	270	0	0		870	1.254	3.85
12/29/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
12/30/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
12/31/2005	0	0	260	0	0	0	300	0	300	0	0	0		860	1.239	3.80
	26400	28800	21060	28800	28800	28800	23100	28800	37500	25920	37440	24000		339420	489.078	1500.93
days	96	85	81	79	85	78	62	80	117	96	187	96				
	138240	121976	116640	113622	121976	112086	89903	115200	168750	138240	269568	138240				
MG	38.016	41.472	30.326	41.472	41.472	41.472	33.264	41.472	54.000	37.325	53.914	34.560				
AF	116.67	127.27	93.07	127.27	127.27	127.27	102.08	127.27	165.72	114.55	165.45	106.06				1500.93

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	1500.40			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
1/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
1/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
1/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/13/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
1/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
1/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
1/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
1/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
1/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
2/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/13/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
2/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
2/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
2/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
2/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
2/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
3/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
3/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/14/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	1500.40			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
3/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
3/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
3/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
3/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
3/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
3/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
4/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
4/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
4/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
4/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
4/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
4/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
4/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
4/30/2005	0	300	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
5/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
5/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
5/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/9/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
5/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
5/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
5/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
5/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
5/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
5/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
6/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
6/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
6/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
6/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
6/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	1500.40				
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
8/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
8/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
8/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
8/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
8/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
8/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
9/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
9/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
9/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
9/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
9/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
9/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
9/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
9/30/2005	0	300	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
10/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
10/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
10/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
10/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/11/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
10/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
10/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
10/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
10/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
10/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
11/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
11/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98

1500 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	1500.40			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
11/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/20/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
11/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
11/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
11/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
11/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
11/30/2005	0	300	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
12/1/2005	300	0	0	0	0	0	0	0	0	300	0	300		900	1.297	3.98
12/2/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/3/2005	300	300	0	0	0	0	0	0	0	0	300	0		900	1.297	3.98
12/4/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/5/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/6/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/7/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/8/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/9/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
12/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/12/2005	0	300	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/13/2005	300	0	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/14/2005	300	0	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/15/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/16/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/17/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/18/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/19/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/20/2005	300	0	0	0	0	0	0	0	0	300	0	0		600	0.865	2.65
12/21/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/22/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/23/2005	0	300	300	0	0	0	0	0	0	0	0	300		900	1.297	3.98
12/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/25/2005	0	300	0	0	0	0	0	0	0	300	300	0		900	1.297	3.98
12/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
12/27/2005	0	0	300	0	0	0	0	0	0	300	0	300		900	1.297	3.98
12/28/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/29/2005	300	0	300	0	0	0	0	0	0	0	300	0		900	1.297	3.98
12/30/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/31/2005	300	300	0	0	0	0	0	0	0	0	0	300		900	1.297	3.98
	65700	67200	69900	0	0	0	0	0	0	73800	31800	30900		339300	488.905	1500.40
days	239	198	269	0	0	0	0	0	0	273	159	124				
	344029	284612	387138	0	0	0	0	0	0	393600	228960	177984				
MG	94.608	96.768	100.656	0.000	0.000	0.000	0.000	0.000	0.000	106.272	45.792	44.496				
AF	290.34	296.97	308.90	0.00	0.00	0.00	0.00	0.00	0.00	326.14	140.53	136.55				1500.40
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
1/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
1/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
1/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
1/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
1/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
1/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
2/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
2/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
2/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
2/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
2/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
2/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
2/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
2/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
3/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
3/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
3/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
3/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
3/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
3/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
3/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
3/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
3/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
3/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
3/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
3/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
3/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
3/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
4/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
4/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
4/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
4/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
4/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
4/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
5/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
5/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15
5/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1,765	5.42
5/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1,909	5.86
5/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
5/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1,758	5.39
6/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1,772	5.44
6/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1,679	5.15

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
6/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
6/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
6/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
6/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
6/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
6/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
6/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
6/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
7/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
7/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
7/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
7/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
7/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
7/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
8/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
8/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
8/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
8/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
8/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
8/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
8/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
9/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
9/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
9/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
9/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
9/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
9/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/3/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/4/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
10/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.785	5.42
10/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/16/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/17/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
10/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
10/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
10/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
10/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
10/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
11/1/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/2/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/3/2005	0	0	260	0	340	0	0	0	0	270	0	0		870	1.254	3.85
11/4/2005	275	0	260	0	340	0	0	0	0	270	0	0		1145	1.650	5.06
11/5/2005	275	0	260	0	340	0	0	0	0	270	0	0		1145	1.650	5.06
11/6/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/7/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/8/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62

2000 Acre-Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2000.00			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
11/9/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/10/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/11/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/12/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/13/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/14/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/15/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/16/2005	0	0	260	0	340	0	0	0	0	270	0	250		1120	1.614	4.95
11/17/2005	0	0	260	0	340	0	0	0	0	270	0	250		1120	1.614	4.95
11/18/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/19/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/20/2005	0	0	260	0	340	0	0	360	0	270	0	0		1230	1.772	5.44
11/21/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/22/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/23/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/24/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/25/2005	275	0	0	365	0	0	370	0	0	0	260	0		1270	1.830	5.62
11/26/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/27/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/28/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/29/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
11/30/2005	0	340	0	0	0	370	0	0	320	0	0	250		1280	1.844	5.66
12/1/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/2/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/3/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/4/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/5/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/6/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/7/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/8/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/9/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/10/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/11/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/12/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/13/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/14/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/15/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/16/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/17/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/18/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/19/2005	0	0	260	0	0	0	0	360	0	270	0	250		1140	1.643	5.04
12/20/2005	275	0	260	0	0	0	0	360	0	270	0	0		1165	1.679	5.15
12/21/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/22/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/23/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/24/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/25/2005	275	0	0	0	0	0	370	0	320	0	260	0		1225	1.765	5.42
12/26/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/27/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/28/2005	0	340	0	365	0	370	0	0	0	0	0	250		1325	1.909	5.86
12/29/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/30/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
12/31/2005	0	340	0	0	0	0	0	360	0	270	0	250		1220	1.758	5.39
	40700	42500	31200	27740	30600	28120	44400	59040	38400	45630	31200	32750		452280	651.700	2000.00
days	148	125	120	76	90	76	120	164	120	169	156	131				
	213120	180000	172800	109440	129600	109440	172800	236160	172800	243360	224640	188640				
MG	58.608	61.200	44.928	39.946	44.064	40.493	63.936	85.018	55.296	65.707	44.928	47.160				
AF	179.86	187.82	137.88	122.59	135.23	124.27	196.21	260.91	169.70	201.65	137.88	144.73				2000.00

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
1/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
2/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
3/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
3/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
4/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
5/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
5/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
6/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
7/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
7/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
8/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
9/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
9/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
10/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48

2000 Acre-Feet
Zero Flow Configuration

well gpm	275	300	260	300	300	300	300	300	300	270	260	250	2001.94			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
11/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
11/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/1/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/2/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/3/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/4/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/5/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/6/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/7/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/8/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/9/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/10/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/11/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/12/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/13/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/14/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/15/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/16/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/17/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/18/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/19/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/20/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/21/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/22/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/23/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/24/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/25/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/26/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/27/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/28/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/29/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/30/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
12/31/2005	105	105	105	105	105	105	105	105	105	105	93	93		1240	1.787	5.48
	38469	38469	38469	38469	38469	38469	38469	38469	38469	38469	34016	34016		452717	652.331	2001.94
days	140	113	148	105	113	104	104	107	120	142	170	136				
	201435	162926	213057	151766	162926	149716	149716	153874	173109	205166	244914	195931				
MG	55.395	55.395	55.395	55.395	55.395	55.395	55.395	55.395	55.395	55.395	48.983	48.983				
AF	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	170.00	150.32	150.32				2001.94
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
1/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/13/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
1/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
1/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
1/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
1/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
1/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
1/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
1/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
1/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
1/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
2/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/12/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
2/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
2/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/24/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
2/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
2/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
2/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
2/28/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
3/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/10/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
3/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/24/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
3/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
3/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
3/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
3/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
3/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/10/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/12/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
4/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/24/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
4/26/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
4/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
4/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
4/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
4/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/12/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
5/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
5/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/24/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
5/26/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
5/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
5/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
5/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
5/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
6/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
6/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/24/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
6/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
6/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
6/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
6/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
6/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
7/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
7/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
7/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
7/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
7/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
7/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
7/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
7/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/1/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
8/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
8/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
8/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
8/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
8/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
8/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
8/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
8/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
8/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
9/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/12/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
9/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
9/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
9/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
9/26/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
9/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
9/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
9/30/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
10/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/10/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/12/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/14/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
10/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/19/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
10/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
10/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
10/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
10/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
10/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
10/31/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/5/2005	300	300	300	0	0	0	0	0	0	0	0	300		1200	1.729	5.31
11/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31

2000 Acre-Feet
Maximum Usage
from New Wells

Well gpm	300	300	300	300	300	300	300	300	300	300	300	300	2000.53			
Day	S-8	S-6	S-7	S-18	S-10	S-11	S-12	S-13	S-15	S-15	S-16	S-17		total gpm	MGD	AF
11/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/10/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/11/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/12/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
11/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
11/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/23/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
11/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
11/26/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
11/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
11/28/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
11/29/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
11/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/1/2005	300	0	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/2/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/3/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/4/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/5/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/6/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/7/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/8/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/9/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/10/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/11/2005	300	300	0	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/12/2005	300	300	300	0	0	0	0	0	0	0	0	0		900	1.297	3.98
12/13/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/14/2005	300	0	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/15/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/16/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/17/2005	0	300	300	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/18/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/19/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/20/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/21/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/22/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/23/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
12/24/2005	300	0	300	0	0	0	0	0	0	300	0	0		900	1.297	3.98
12/25/2005	300	300	0	0	0	0	0	0	0	300	300	0		1200	1.729	5.31
12/26/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/27/2005	0	300	300	0	0	0	0	0	0	300	0	300		1200	1.729	5.31
12/28/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/29/2005	300	300	300	0	0	0	0	0	0	300	300	0		1500	2.161	6.63
12/30/2005	300	300	300	0	0	0	0	0	0	300	0	0		1200	1.729	5.31
12/31/2005	300	300	300	0	0	0	0	0	0	300	0	300		1500	2.161	6.63
	88500	99900	95100	0	0	0	0	0	0	101400	33600	33900		452400	651.873	2000.53
days	322	294	366	0	0	0	0	0	0	376	168	136				
	463418	423106	526708	0	0	0	0	0	0	540800	241920	195264				
MG	127.440	143.856	136.944	0.000	0.000	0.000	0.000	0.000	0.000	146.016	48.384	48.816				
AF	391.10	441.48	420.27	0.00	0.00	0.00	0.00	0.00	0.00	448.11	148.49	149.81				2000.53
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17				

2285 Acre -Feet

Well gpm	275	340	260	365	340	370	370	360	320	270	260	250	2284.98			
Day	S-8	S-7	S-6	S-18	S-10	S-11	S-12	S-13	S-15	S-14	S-16	S-17		total gpm	MGD	AF
1/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
1/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
1/11/2005	275	0	260	0	340	0	370	0	0	0	260	0		1505	2.169	6.66
1/12/2005	275	0	0	0	0	370	0	320	0	0	260	0		1225	1.765	5.42
1/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
1/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
1/22/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/23/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/24/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/25/2005	275	0	0	0	0	370	0	360	0	0	260	0		1265	1.823	5.59
1/26/2005	275	0	260	0	0	370	0	360	0	0	0	250		1515	2.183	6.70
1/27/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
1/28/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
1/29/2005	0	0	260	0	340	0	370	0	0	270	0	250		1490	2.147	6.59
1/30/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
1/31/2005	275	0	260	0	340	0	370	0	0	0	0	250		1495	2.154	6.61
2/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
2/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/11/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
2/12/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
2/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/20/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/21/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
2/22/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/23/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/24/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/25/2005	275	0	260	0	0	370	0	360	0	0	260	0		1525	2.197	6.74
2/26/2005	275	0	260	0	0	370	0	360	0	270	0	0		1535	2.212	6.79
2/27/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
2/28/2005	0	340	0	0	340	0	370	0	0	270	0	250		1570	2.262	6.94
3/1/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/2/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/3/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/4/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/5/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/6/2005	0	340	0	365	0	0	0	360	0	270	0	0		1335	1.924	5.90
3/7/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/8/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/9/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/10/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/11/2005	275	0	260	0	340	0	370	0	320	0	0	0		1565	2.255	6.92
3/12/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/13/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/14/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/15/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/16/2005	0	340	0	0	0	370	0	320	0	0	260	0		1290	1.859	5.70
3/17/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
3/18/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77
3/19/2005	0	0	0	365	0	0	370	0	320	0	0	250		1305	1.880	5.77

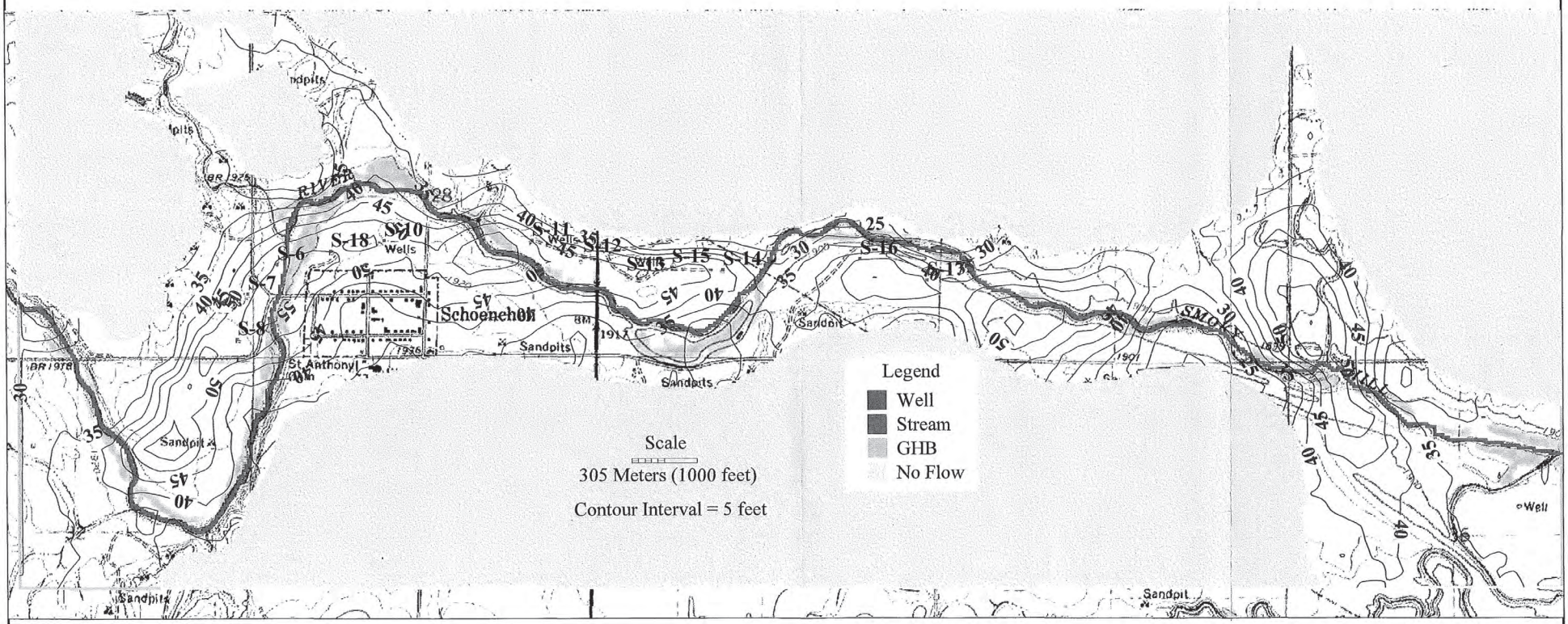
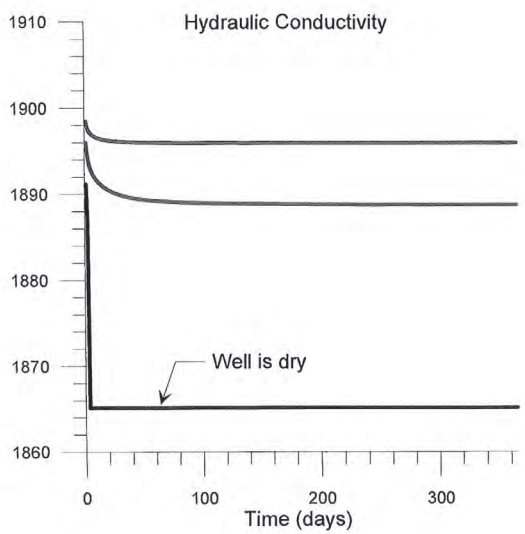
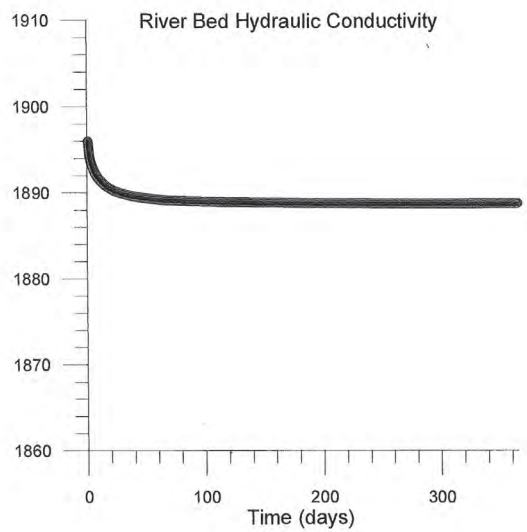


Figure 6
Depth to Bedrock in Feet

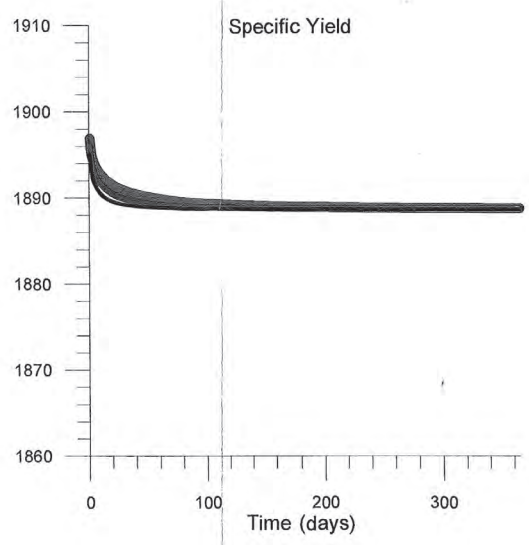
Burns & McDonnell
SINCE 1898



LEGEND
- K = 65 feet/day
- K = 131 feet/day
- K = 262 feet/day



LEGEND
- Kriv = 33 feet/day
- Kriv = 65 feet/day
- Kriv = 131 feet/day



LEGEND
- Sy = 0.1
- Sy = 0.2
- Sy = 0.4

Data from monitoring point at S-10. Pumping rate = 360 gpm on Jan. 19, 2005. Observed drawdown was 11.81 feet.

Burns & McDonnell SINCE 1898

Figure 7
MODEL SENSITIVITY

sensitivity.grf 9/15/05

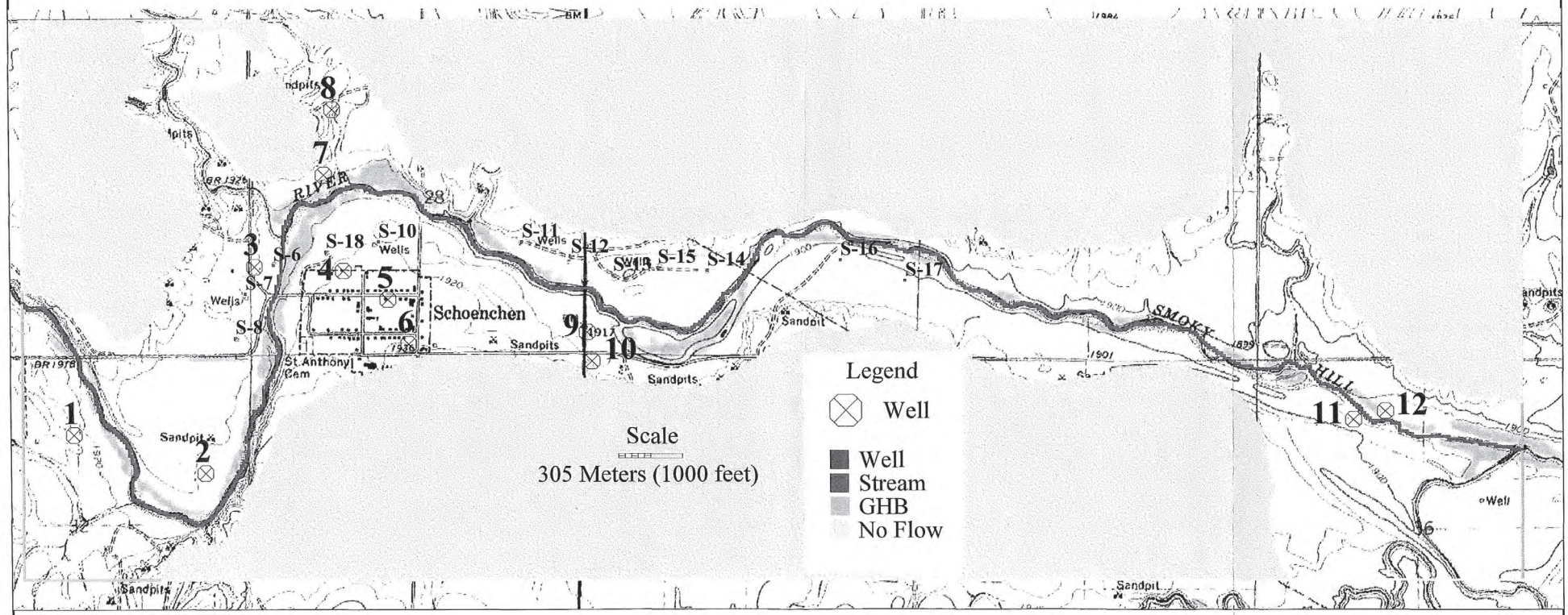


Figure 8
Water Level Monitoring Points

Burns & McDonnell
SINCE 1898

Date: April 24, 2013

To: Toby Dougherty

From: Daniel Clement

Subject: Cedar Bluff Release

Due to the persistent drought conditions experienced during 2011 and 2012 and predicted continuation of drought conditions in 2013, the City of Hays, Kansas (City) requested a release of water from the artificial recharge storage pool in Cedar Bluff Reservoir. This request was made in accordance with the conditions of the September 22, 2004 Cedar Bluff Reservoir Artificial Recharge Pool Operations Agreement.. The purpose of the release was to replenish the aquifer in the vicinity of the Smoky Hill River Well Field (SHRWF) near Schoenchen, Kansas. In addition, the City of Russell requested a release from their municipal use storage pool in order to replenish lowering water levels in the City of Russell's Pfeifer well field. The purpose of this Technical Report is to document and provide discussion of post-release impacts.

Background:

Kansas Water Office (KWO) Artificial Recharge Storage Pool:
The KWO controls up to 5110 Acre-Feet (AF) of storage in Cedar Bluff Reservoir designated for use as artificial recharge for the Smoky Hill River alluvium. At the end of 2012 1252 AF remained in the KWO storage pool. By February of 2013 this amount was further reduced to 1240 AF (Figure 1).

City of Russell Municipal Storage Pool:
The City of Russell, Kansas, owns storage in the Cedar Bluff Reservoir up to maximum of 2,700 AF. The water is for municipal use and their storage pool was full in August 2012. Low inflow and evaporation reduced the Russell storage allocation to 2534 AF by the end of 2012 and it was down to 2511 AF by February of 2013 (Figure 1).

Previous Releases

Releases from the KWO Artificial Recharge Storage Pool:
2005 – No releases were made from the artificial recharge pool.

2006 – At the City of Russell's request, the KWO initiated a release from the artificial recharge pool on July 26, 2006. Records indicate a total of 1368 AF were released from the KWO pool at a rate of 50 cubic feet per second (CFS) for the duration of the release period. This release was combined with additional flows from City of Russell municipal storage for a total release of 3051 AF, according to the KWO reservoir accounting summary. Flow progress was impeded by actively growing vegetation in the river channel; however, the flow did reach the upper Schoenchen gage 16.8 days after the release was initiated.

Estimates of recharge to the City's SHRWF were complicated by several large precipitation events. Aquifer recharge during and after the release raised groundwater levels to near or above established baseline levels. The release from the combined KWO and City of Russell release resulted in a drop of 0.66 feet in the Cedar Bluff Reservoir pool elevation, in addition to a 0.51 feet drop due to evaporation loss.

Releases from the City of Russell Municipal Storage Pool:

2005 – The City of Russell initiated a release of water from the municipal storage pool on December 14, 2005 which lasted until December 28, 2005. Records indicate a total of 1,405 AF were released at a constant rate of 50 CFS for the duration of the release period. Flow progress was stalled due to vegetation and ice dams in the channel; however the flow did reach the United States Geological Survey (USGS) Upper Schoenchen gage on December 23, 2005 after 7.8 days, and eventually stopped within the City of Russell well field near Pfeifer, Kansas.

Estimates based on the USGS gages above and below Schoenchen indicate approximately 459 AF of the December 2005 release were recharged into the City's SHRWF. The release resulted in a drop of 0.33 feet in the Cedar Bluff Reservoir pool elevation.

2006 – The City of Russell initiated a release from the municipal storage pool on August 9, 2006 during a continual and combined release effort with the KWO release which began on July 26, 2006. The release stopped on August 19, 2006 after approximately 1683 AF were released from municipal storage at a variable release rate of 50-250 CFS. The flow reached the City of Russell well field near Pfeifer 23 days after the combined release began. Flow amounts were complicated from runoff during precipitation events on August 18th &19th.

Recharge to the City's SHRWF from the combined release raised the depleted groundwater levels back to or above baseline levels. The release from the combined KWO and City of Russell release resulted in a combined 0.66 feet drop in the Cedar Bluff Reservoir pool elevation.

2013 KWO and City of Russell Releases - Effects on Cedar Bluff Reservoir:

Based on the most recent March accounting report for Cedar Bluff Reservoir, the total amount of water released from the KWO Artificial Recharge storage pool for the 2013 release was 1186 AF (386 Million Gallons (MG)) leaving only 44 AF remaining in the KWO Artificial Recharge storage pool (Figure 1). Discharge rates for the 2013 release are shown in Table 1. The initial release rate of 250 CFS was chosen in an effort to encourage downstream progress and to overcome impeding vegetation in the river channel.

Table 1: *KWO Artificial Recharge Pool Release Schedule*

Date	Proposed Release Rate	Actual Release Rate
March 4th	250 CFS for 24 Hours	250 CFS for 24 Hours
March 5th	150 CFS for 24 Hours	150 CFS for 24 Hours
March 6th – 10th	50 CFS for 96 Hours	50 CFS for 96 Hours

According to data from the Bureau of Reclamation (BoR), immediately prior to the release of water on March 4th, Cedar Bluff Reservoir had a pool elevation of 2122.66 feet. Reservoir pool elevation on March 11th following the KWO Artificial Recharge release was 2122.27, which indicates a total drop of approximately 0.39 feet over the release period (Table 2).

Table 2: *KWO Daily Release Rates & Cedar Bluff Elevation Changes*

Date	Reservoir Discharge Rate	Reservoir Pool Elevation (ft)	Reservoir Daily Elevation Change (ft)
March 4th	250 CFS	2122.66	0.00
March 5th	150 CFS	2122.53	-0.13
March 6th	50 CFS	2122.41	-0.12
March 7th	50 CFS	2122.36	-0.05
March 8th	50 CFS	2122.32	-0.04
March 9th	50 CFS	2122.30	-0.02
March 10th	50 CFS ~10:00am	2122.28	-0.02
March 11th	0.00 CFS	2122.27	-0.01

Based on the most recent March accounting report for Cedar Bluff Reservoir, the total amount of water released from the City of Russell's Storage Pool was approximately 1231 AF (401 MG) leaving 1259 AF remaining in the City of Russell municipal storage pool. The City of Russell also chose to increase the rate of release when compared to previous years in an effort to encourage downstream progress and to overcome impeding vegetation in the river channel as illustrated in Table 3. Data from the BoR indicates that prior to the City of Russell's release on March 14th, Cedar Bluff Reservoir had a pool elevation of 2122.26 feet. Reservoir pool elevation on March 19th following City of Russell's release was 2121.84 feet, which indicates a total drop of approximately 0.42 feet over the release period as shown in Table 4.

Table 3: *City of Russell Municipal Storage Pool Release Schedule*

Date	Proposed Release Rate	Actual Release Rate
March 14th	250 CFS for 24 Hours	250 CFS for 24 Hours
March 15th & 16th	150 CFS for 48 Hours	150 CFS for 48 Hours
March 17th – 21st	50 CFS for 96 Hours	50 CFS for 33 Hours

Table 4: *KWO Daily Release Rates & Cedar Bluff Elevation Changes*

Date	Reservoir Discharge Rate	Reservoir Pool Elevation (ft)	Reservoir Daily Elevation Change (ft)
March 14th	250 CFS	2122.26	+0.01
March 15th	150 CFS	2122.12	-0.14
March 16th	150 CFS	2122.01	-0.11
March 17th	50 CFS	2121.91	-0.10
March 18th	50 CFS ~7:00PM	2121.87	-0.04
March 19th	0.00 CFS	2121.84	-0.03

KWO Artificial Recharge Pool - Release Tracking and Flow Progress:

Several agencies and interested parties monitored the release from the KWO Artificial Recharge Storage Pool including: KWO, Kansas Division of Water Resources (DWR), BoR, USGS, Kansas Department of Wildlife Parks & Tourism, City of Russell and the City.

The DWR indicated that they had installed water level data loggers are various points upstream and downstream of the City's SHRWF in order to track the flow and recognize impacts to aquifer levels. DWR also indicated that full information from the data loggers would be available sometime in May 2013.

The USGS setup a temporary stream gage at the Ellis Avenue Bridge. USGS also maintained and calibrated the real time stream gages at several other existing stations during the release (Upper Shoenchen, Lower Shoenchen, and near Pfeifer). The wetting front of the flow was also visually tracked and timed as it arrived at various landmarks along the Smoky Hill River as shown in Table 5.

Table 5: *KWO Artificial Recharge Release – Wetting Front & Flow Arrival Times*

Flow Location	Flow Arrival Date & Time	River Miles Between Sites	Total River Miles Progressed	Average Speed Between Locations
370 Ave Bridge	Mar 4th ~ 10:00PM	4.0 Miles	4.0 Miles	8 Miles/Day
390 Ave Bridge	Mar 5th ~ 6:00AM	2.94 Miles	6.94 Miles	8.8 Miles/Day
400 Ave	Mar 5th ~ 7:52AM	1.14 Miles	8.08 Miles	14.6 Miles/Day
Ellis Ave Bridge	Mar 5th ~ 9:30PM	3.6 Miles	11.68 Miles	6.3 Miles/Day
180 Ave Bridge	Mar 7th ~ 9:00AM	7.87 Miles	19.55 Miles	5.3 Miles/Day
210 Ave Bridge	Mar 8th ~ 9:00AM	3.70 Miles	23.25 Miles	3.7 Miles/Day
220 Ave	Mar 8th ~ 4:00PM	1.51 Miles	24.76 Miles	5.2 Miles/Day
USGS Upper Sch. Gage	Mar 9th ~ 1:00AM	1.67 Miles	26.43 Miles	4.45 Miles/Day
240th/Shoenchen Rd	Mar 9th ~ 6:15PM	1.23 Miles	27.66 Miles	1.7 Miles/Day
Dinges Property	Mar 11th ~ 10:00AM	0.58 Miles	28.24 Miles	0.35 Miles/Day
East of 183 HWY	Mar 15th ~ 2:30PM	1.0 Miles	~29.24 Miles	Final Location

The release from the KWO Artificial Recharge pool took 109 hours (4.5 days) to reach the western extent of the SHRWF marked by the USGS Upper Gage located just west of Schoenchen, KS. The furthest extent of the wetting front of the KWO Artificial Recharge release stalled with no further progress approximately 200 yards east of the U.S. Highway 183 Bridge despite continued inflows at the USGS Upper Schoenchen Gage.

City of Russell Municipal Storage Pool – Release Tracking and Flow Progress:

The release from the City of Russell's Municipal Storage pool began at 10:00am on the morning of March 14th. The flow from the release arrived at the USGS Upper Schoenchen Gage at approximately 7:30pm the evening of March 16th. The City of Russell's release from Cedar Bluff only took 2.4 days to reach the western extent of the City of Hays Smoky Hill River Well Field (SHRWF) marked by the USGS Upper Schoenchen river gage. This calculates to an average flow progress in the upper aquifer reach of 11.0 river miles per day. The faster arrival time of the City of Russell release, despite similar release rates verifies that the KWO release improved stream conditions by laying over vegetation, saturating the banks and river bed, and recharging the upper reaches of the aquifer.

The combined flow from the KWO and City of Russell release reached the western extent of the City of Russell's well field (320th Avenue) near Pfeifer, KS on March 18th, at approximately 7:30pm (see Table 6). It is clear from simply comparing the arrival times in from the two releases at each of the USGS stream gages, that distinct flow advantages exist when the river channel is saturated or flowing prior to a release (Figure 2).

Table 6: *City of Russell Release – Flow Arrival Times*

Flow Location	Flow Arrival Date & Time	River Miles Between Sites	Total River Miles Progressed	Average Speed Between Locations
Ellis Ave Bridge	Mar 15th ~ 12:45PM	11.68 Miles	11.68 Miles	10.5 Miles/Day
USGS Upper Sch. Gage	Mar 16th ~ 7:30PM	14.75 Miles	26.43 Miles	11.5 Miles/Day
USGS Lower Sch. Gage	Mar 17th ~ 11:30AM	4.5 Miles	30.93 Miles	6.8 Miles/Day
Russell WF (320th Ave)	Mar 18th ~ 7:30PM	10.0 Miles	40.93 Miles	7.5 Miles/Day
USGS Pfeifer Gage	Mar 19th ~ 4:00PM	2.15 Miles	43.08 Miles	2.5 Miles/Day

Post Release Impacts on the Upper Smoky Hill Alluvial Aquifer

To document release impacts on the upper reaches of the Smoky Hill Aquifer below Cedar Bluff Reservoir, temporary stream gage stations and groundwater monitoring sites were established prior to any releases from Cedar Bluff Reservoir.

USGS Temporary Stream Gage – Ellis Avenue Bridge

Staff from the USGS installed a temporary stream gage on the Smoky Hill River near the Ellis Avenue Bridge. The period of record for this stream gage is March 4th through April 3rd which indicates the stream gage documented the nearly all of the flow from both the KWO and City of Russell releases. According to the temporary stream gage, approximately 2134 AF out of the total 2417 AF (88% of the combined release) passed the Ellis Bridge site (Figure 3). When data from the Ellis Avenue stream gage site is combined with data from additional downstream sites, a better overall picture can be drawn of where release flows were captured as aquifer recharge and bank storage (Figure 4). Specifically the Smoky Hill Aquifer above the USGS Upper Schoenchen gage experienced 1031 AF of total recharge from the combined flows of the KWO and City of Russell release.

Division of Water Resources – Groundwater Monitoring Sites

Staff from the Kansas Division of Water Resources installed temporary data loggers and pressure transducers at several groundwater monitoring sites along the upper reaches of the aquifer (Figure 5). Each of the sites provided hourly data, and were located close enough to the river to record the approximate arrival time of the release flows. A summary of the groundwater level improvements at each site of is provided in Table 7 below along with supplemental hydrographs (Figures 6 through 9).

Based on the water level improvements in the upper reaches of the aquifer, and the faster travel times of the City of Russell release, the release from the KWO Artificial Recharge Pool functioned as intended and recharged the upper reaches of the Smoky Hill River Alluvial Aquifer and provided increased saturation of the river channel.

Table 7: *Water Level Improvements - Upper Smoky Hill Aquifer*

DWR Mon. Site Name	Road/River Intersection	Meas. Date	Depth to Water Meas. (ft)	Depth to Water Pre-Release (ft)	Water Level Improvement (ft)
TR13	370 Avenue	March 18	9.11	9.49	0.38
TR17	390 Avenue	March 18	13.64	14.50	0.86
Dechant	160 Avenue	March 18	8.1	3.18	4.92
Riechart	200 Avenue	March 18	10.93	12.9	1.97

Post Release Impacts in the City of Hays Smoky Hill River Well Field

The most recent calibration of the USGS Upper Schoenchen river gage indicates approximately 294.5 AF of the KWO Artificial Recharge Pool entered the SHRWF prior to the secondary arrival of the City of Russell release. Given the observation that the wetting front of the KWO release never exited the SHRWF or reached the lower gage, the majority of the 294.5 AF that entered the well field during this time went directly to aquifer recharge. If the Russell release were not initiated, it is likely that a significant portion of the remaining KWO release flow would have continued to enter the well field and recharged the SHRWF in similar patterns to the winter 2005 releases. Similarly if the KWO release would not have occurred prior to the City of Russell release, a larger percentage of the City of Russell release would be expected to recharge the SHRWF and upper reaches of the alluvial aquifer prior to any downstream progress.

April 15th was determined to be a reasonable cutoff point for release data based on the inability to differentiate between Cedar Bluff release flows and other sources of inflow past the USGS Upper Schoenchen stream gage. As of 12:00pm April 15th, 1386 AF of the combined KWO and City of Russell release passed the USGS Upper Schoenchen Gage and entered the City's SHRWF. According to the USGS Gage below Schoenchen as of 12:00pm April 15th, only 549 AF has left the well field, indicating the balance of 837 AF recharged the aquifer, remains in channel, or is captured in bank storage. Note that after the arrival of the City of Russell release at the upper gage, water from both the KWO and City of Russell release were intermixed.

Observation of groundwater levels were documented and monitored daily and in real time at several monitoring sites and production wells throughout the City's SHRWF. The City largely shutdown production from the SHRWF several days prior to any release flow arrival, (only operating well no. 23), effectively mitigating the effects of municipal well drawdown. Table 8 below illustrates the positive responses seen in several of the City's production wells and the USGS monitoring stations. Hydrographs of the site illustrate water level increases of 2-9 feet, and clearly show a direct connection between the river and the aquifer via rising water levels from the arrival of both the KWO release and the combined City of Russell flow (Appendix A).

Table 8: *SHRWF Groundwater Monitoring Sites & Water Level Improvements*

Monitoring Site Name	SHRWF Location	Measurement Date	Depth to Water Measurement (ft)	Depth to Water Pre-Release (ft)	Water Level Improvement (ft)
Hays Smoky Well #8	West	April 10th	25.31	31.30-	5.99
Hays Smoky Well #10	West	April 17th	29.86	36.90	7.04
Hays Smoky Well #11	Central	April 17th	17.93	23.90	5.97
Hays Smoky Well #13	Central	April 17th	17.86	22.37	4.51
Hays Smoky Well #14	Central	April 17th	18.08	22.40	4.32
Hays Smoky Well #16	East	April 17th	22.39	26.76	4.37
Hays Smoky Well #18	West	April 17th	22.83	32.70	9.87
Hays Smoky Well #19	West	April 3rd	29.48	32.2	2.72
Hays Smoky Well #20	West	April 17th	23.07	32.16	9.09
Hays Smoky Well #21	East	April 17th	23.32	30.15	6.83
Hays Smoky Well #22	East	April 10th	22.24	28.94	6.70
USGS Well T-19	West	April 17th	16.82	21.00	4.18
USGS Well T-17	East	April 17th	12.07	17.42	5.33
USGS Well T-13	Central	April 17th	11.38	15.69	4.31
USGS Well T-11	West	April 17th	17.54	26.25	8.71
USGS Well T-12	Central	April 17th	11.83	17.43	5.60

The City chose to limit operation of the SHRWF prior to, during, and after the release. During the period of February 1st to March 17th, the city withdrew a total of 170.58 AF (55.58 MG) (Table 9). This indicates the city only withdrew approximately 20% of the estimated 837 AF of recharge. Historic water use shows the City will on average produce around 1000 AF annually from the SHRWF given normal demands. Based on the historic annual water use, the amount of recharge gained from the combined KWO and City of Russell release provided nearly an entire year of additional supplies if demand remains typical.

In addition, the SHRWF has somewhat limited saturated thickness in certain locations. The City has therefore gained immediate operational security, due to the water level improvements seen at each of the production well sites. Based on the improved water levels, the KWO release functioned as intended, and replenished the City's SHRWF.

Table 9: *SHRWF Pumping – February 1 to April 17, 2013*

Monitoring Site Name	SHRWF Location	Million Gallons Pumped	Acre-Feet Pumped
Hays Smoky Well #8	West	5.69	17.49
Hays Smoky Well #10	West	4.80	14.73
Hays Smoky Well #11	Central	3.03	9.31
Hays Smoky Well #13	Central	0.00	0.00
Hays Smoky Well #14	Central	5.20	15.97
Hays Smoky Well #16	East	0.129	0.40
Hays Smoky Well #18	West	2.65	8.14
Hays Smoky Well #19	West	5.01	15.39
Hays Smoky Well #20	West	5.397	16.56
Hays Smoky Well #21	East	6.90	21.18
Hays Smoky Well #22	East	5.95	18.28
Hays Smoky Well #23	East	10.78	33.09

Conclusions:

- 1186 AF were released from KWO Artificial Recharge storage pool;
- 1231 AF were released from the City of Russell Municipal storage pool;
- 294.5 AF of the KWO Artificial Recharge Pool release entered the SHRWF and entered the aquifer as recharge prior to the secondary arrival of the City of Russell release;
- The increased rate of release to 250 CFS promoted downstream flow progress by increasing flow velocities through channel vegetation;
- The combined flows from the KWO and City of Russell release (2417 AF) have contributed approximately 837 AF as aquifer recharge in the SHRWF;
- Cedar Bluff Reservoir pool elevation dropped approximately 0.39 feet over the KWO Artificial Recharge Pool release period;
- Cedar Bluff Reservoir pool elevation dropped approximately 0.42 feet over the City of Russell Municipal Storage Pool release period;
- It is clear from the faster arrival time of the City of Russell release that the KWO Artificial Recharge release saturated river the river channel alluvium upstream of the SHRWF;
- The saturation of the river alluvium in the upper reaches of the river facilitates additional recharge opportunities in the SHRWF by reinforcing the flow from any spring precipitation;

- Groundwater level monitoring sites indicate the majority of the wells in the SHRWF have seen a rise in groundwater levels in the range of 2 to 9 feet with an average increase of nearly 6 feet;
- Groundwater level rises provide the City of Hays with increased well operational security based on the limited saturated thickness in the SHRWF; and
- The amount of recharge gained from the combined KWO and City of Russell release provided nearly an entire year of additional supplies if demand remains typical.

Future Release Recommendations:

- Additional monitoring of the upper aquifer reach in order to better understand and quantify where recharge is occurring to better predict future upper reach responses;
- Additional monitoring sites installed in lines perpendicular to the river could allow for better estimation of bank storage;
- Future selected release rates from the reservoir should take into consideration stream condition (saturation, vegetation, existing flow, etc) as increased rates appear to be effective in promoting water flow further downstream; and
- Improved coordination between government agencies such as the DWR and USGS would be beneficial to aid in implementation of additional monitoring (temporary stream gages, data loggers, transducers, etc.).

Kansas Geological Survey
Public Information Circular 35 • August 2013

Kansas Droughts: Climatic Trends Over 1,000 Years

Anthony L. Layzell and **Catherine S. Evans**, Kansas Geological Survey

Environmentally and economically, drought is one of the most costly natural disasters in North America. Yet it rarely gets the same public attention that other, more spectacular, natural disasters receive. While tornadoes, floods, wildfires, and hurricanes leave behind well-defined swaths of devastation in relatively short order, droughts whittle away at water quality and quantity, topsoil, crop yields, and other natural and socioeconomic resources over months and years, even decades.

In any given year, drought conditions of some degree are occurring somewhere in North America. For 1988—midway through a three-year drought in the central and eastern United States—the estimate of national drought damage was a record $40 billion (National Climatic Data Center, 2012), or $78.5 billion in 2013 dollars. In 2011, losses in Kansas alone exceeded $1.7 billion (Kansas Department of Agriculture, 2011). The 1930s and 1950s droughts, however, remain the benchmarks for the 20th century in terms of duration, severity, and spatial extent. The historically unprecedented dust storms in the 1930s, exacerbated by the rapid spread of farming practices unsuitable for the semi-arid High Plains, helped make the Dust Bowl the most memorable drought in modern times (fig. 1). Two decades later, 1956 surpassed 1934 as the single most severe drought year ever documented statewide based on instrumental precipitation and temperature readings.

Yet the major 20th-century droughts, as impressive as they were, do not rank as the two most intense or enduring droughts to hit Kansas. For decades, scientists have been collecting and analyzing data to reconstruct **paleoclimates**—past climates dating back thousands of years—from clues in tree rings, sediments, and other **proxies**. Several past drought episodes, it turns out, have exceeded those of the 1930s and 1950s in severity, extent, and duration (Layzell, 2012). If such a drought occurred today, reductions in surface-water and groundwater resources would threaten municipal, industrial, and agricultural water supplies and cause widespread crop failure.

Figure 1—Drifts of wind-blown soil on a farm near Liberal, Kansas, March 1936 (photo by Arthur Rothstein: Library of Congress).

Being able to better forecast and plan for severe drought conditions is vital. Temperature and precipitation records are indispensable for understanding climate change but are largely restricted to the past 100 years. To assess the full range of drought variability that has occurred over 1,000 or more years, climatologists and other scientists measure the severity of pre-20th-century droughts using reconstructed paleoclimatic data from proxies and analyze the results in combination with more than a century of instrumental data.

Drought Measurement and The Palmer Drought Severity Index (PDSI)

Several indices have been developed to measure drought. The Palmer Drought Severity Index (PDSI), one of the most widely used indices in North America, was introduced in 1965 and is used to measure the severity of a drought occurrence for a specified period. PDSI values can be calculated from weather data collected using thermometers, rain gauges, and other instruments—available for most of North America since about 1895—or from paleoclimatic data reconstructed from tree rings and other proxy evidence.

PDSI values, representing relative wetness and dryness, are assigned after recorded precipitation and temperature

KU Kansas Geological Survey
The University of Kansas

data or proxy data are analyzed to determine how much soil moisture was available at a specific time compared to how much would be available under average conditions. The values typically range from -4 (extremely dry) to 4 (extremely wet), although the range is unlimited. Although a PDSI value of -4 or less (even more extreme) is daunting, a persistent drought averaging moderate (-2) to severe (-3) PDSI values over many years may actually cause more damage than a more severe but shorter episode. Plotted PDSI values provide a picture of climate variability over time and can be used to calculate the duration of drought conditions. The extent of the 1930s and the 1950s droughts—and the relatively wet years in between—are evident in the PDSI trends for Kansas from 1895 to 2011 (fig. 2).

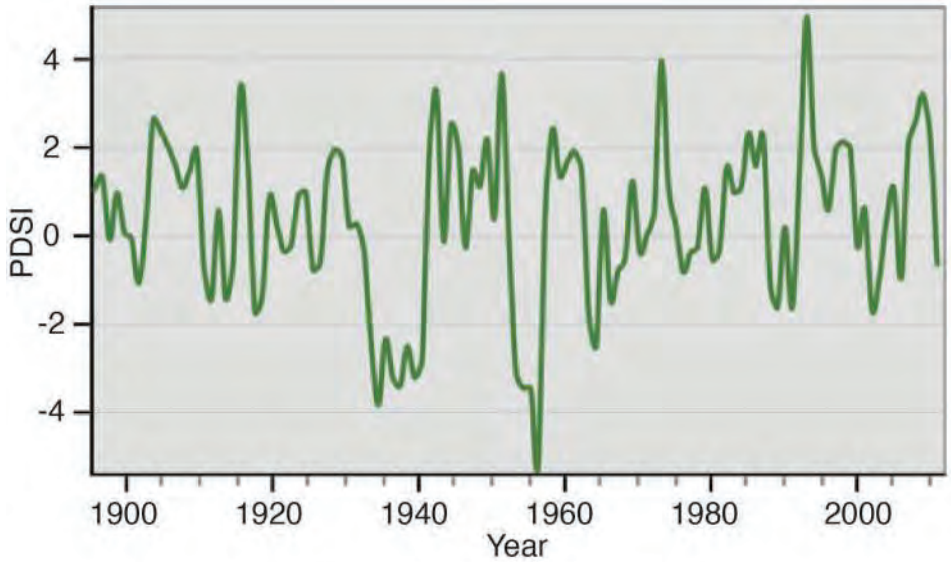


Figure 2—Palmer Drought Severity Index (PDSI) trends in Kansas, 1895–2011 (High Plains Aquifer Atlas, 2012).

Tree-Ring Chronologies and Other Proxies

Data gleaned from various proxies provide insight into paleoclimates in North America dating back hundreds to thousands of years, depending on location. Annual growth rings in living trees and preserved wood are measured to reconstruct climatic patterns over extensive areas. Wide tree rings in highly drought-sensitive trees typically indicate a long growing season with adequate moisture, and very narrow rings usually signify drought conditions (fig. 3). The exact calendar year a tree ring was formed can be determined by crossdating, a technique that statistically matches the patterns in tree-ring characteristics among several living or dead trees in a region.

Data collected on crossdated trees in a given area form a tree-ring chronology, which can then be used to identify wide-ranging climatic trends. Synthesized data from hundreds of interlinking chronologies have been used to re-create annual climate patterns dating back at least a thousand years throughout most of North America. An extensive and ever-expanding network of annual tree-ring chronologies is accessible through the International Tree-Ring Data Bank (http://www.ncdc.noaa.gov/paleo/treering.html).

Reconstructed PDSI values based on tree-ring chronologies are available for as far back as 837 AD in western Kansas and the whole state by 1000 AD. In several studies of North American drought, up to 835 tree-ring chronologies were used to reconstruct annual growing-season PDSI values across the continent (Cook and Krusic, 2004; Cook et al., 2004; Stahle et al., 2007). Although trees, and thus tree-ring chronologies, are sparse in the Great Plains, investigators have been able to determine paleoclimatic patterns there using predictive models that rely partially on chronologies from surrounding regions. The integrity of this methodology has been verified by matching reconstructed 20th-century PDSI values for the Great Plains to PDSI values based on 20th-century Great Plains instrumental record (Cook and Krusic, 2004; Stahle et al., 2007).

A diverse variety of other proxies, derived from sand dunes, lake sediment, coral reefs, ice sheets, rock formations, microfossils, cave deposits, archaeological discoveries, and historical records, help verify past droughts identified in tree-ring studies. For example, evidence from once-active sand dunes in Kansas testifies to the periodic droughts that occurred in the state over several centuries (Arbogast, 1996), while far-off ice cores in Greenland and coral reefs in the South Pacific hold clues to worldwide paleoclimatic patterns (NOAA, 2010) that may have contributed to periods of aridity in the Great Plains.

Figure 3—Cross section showing tree rings of a Douglas-fir (Pseudotsuga menziesii) *from the Zuni Mountains, New Mexico (courtesy of Laboratory of Tree-Ring Research, University of Arizona: photo by R. K. Adams).*

Drought Severity and Duration

A key characteristic distinguishing the 1930s and 1950s droughts from other modern drought periods is aridity that was not only severe but also long lasting. The negative effects of one extremely dry year can be overcome relatively quickly when it is preceded or followed by a wetter year, but several years of nearly uninterrupted drought can lead to serious long-lasting socioeconomic and environmental problems. The PDSI value for 2002 in southwestern Kansas was -7.1, compared to -5.0 for the peak year of the Dust Bowl, yet the situation was not as dire in 2002 because it was bounded by years with positive PDSI values.

Year to year, climatic conditions vary across the state, with droughts hitting some regions harder than others. Since 1000 AD, southwestern Kansas has experienced a greater number of extreme droughts than southeastern Kansas (fig. 4). This west to east trend mirrors the strong latitudinal

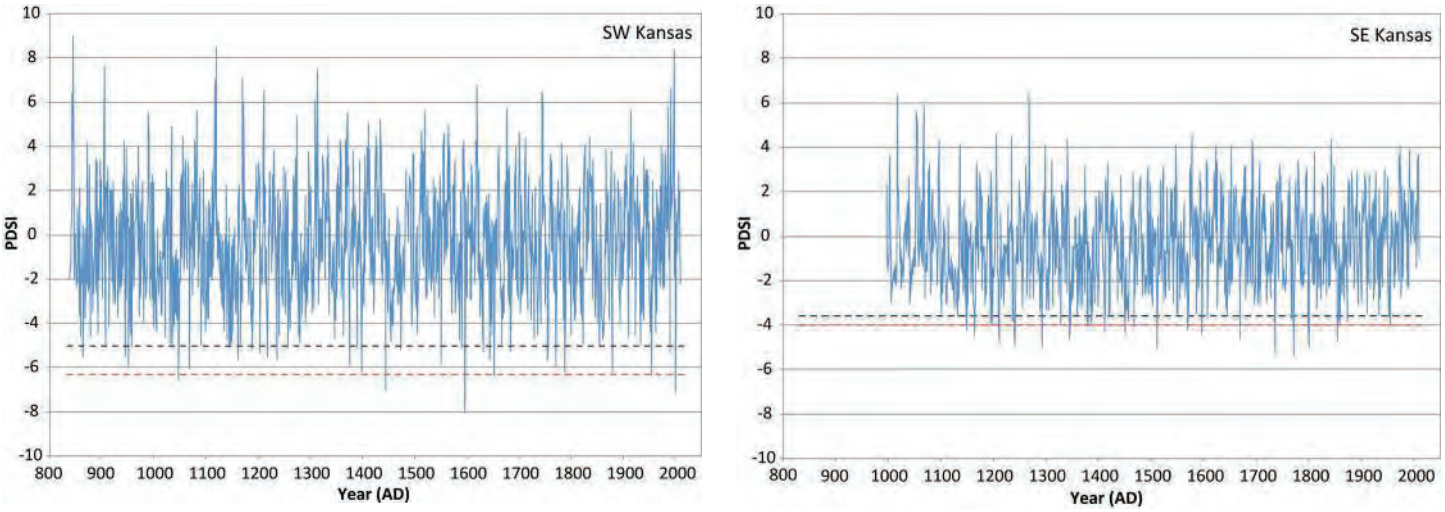


Figure 4—Annual PDSI reconstructions showing drought severity in southwestern Kansas (left) and southeastern Kansas (right). Dashed lines indicate 1934 (black) and 1956 (red) PDSI values (Layzell, 2012). PDSI values are from Cook and Krusic, 2004. Reconstructions for all six Kansas regions are online at http://www.kgs.ku.edu/Hydro/Publications/2012/OFR12_18/index.html).

climate gradient in Kansas (High Plains Aquifer Atlas, 2012). Average precipitation today gradually increases from about 15 inches along the Colorado border to 45 inches in the southeastern corner of the state (High Plains Aquifer Atlas, 2012).

Just as drought severity varies from west to east, it also varies from north to south. Overall, PDSI data indicate that northern Kansas has on average experienced more severe droughts than southern Kansas in the past millennium, possibly because conditions that created droughts on the northern Great Plains occur more often. Several studies suggest that some droughts may be driven by changes in sea surface temperature (SST), particularly in the equatorial Pacific (Stahle et al., 2007). When the equatorial Pacific SST is cold, droughts are common in the southern plains as frontal weather systems are driven more northward. The 1950s drought fit that pattern. In contrast, the Dust Bowl, centered on the Pacific Northwest and northern Plains, was likely influenced by other conditions. These include warm Atlantic SST anomalies that prevented moisture from entering the Great Plains from the Gulf of Mexico (Schubert et al., 2004), and possibly a random atmospheric variation (Hoerling et al., 2009). The maps in fig. 5 illustrate the differences in spatial patterns between the two major 20th-century droughts.

Calculating the duration of droughts can be difficult because multi-year dry intervals are often punctuated with occasional wet years. Furthermore, there is no single method for calculating duration. For this publication, the durations of the 1930s and 1950s drought episodes in Kansas were calculated by smoothing PDSI values—that is, filtering out the extreme high and low values by averaging over a 10- or 50-year period—to identify long-term patterns of drought duration. The beginning and end of each drought period are demarcated by periods of more than two consecutive years of positive PDSI values. In fig. 6, smoothed PDSI values were plotted to show the duration of droughts in southwestern and southeastern Kansas.

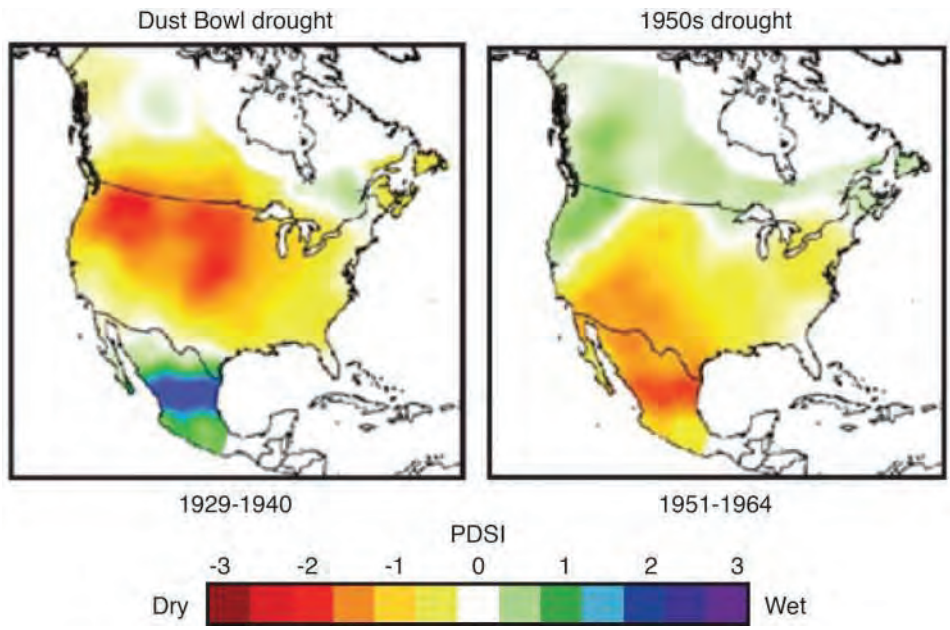


Figure 5—Spatial patterns of the 1930s and 1950s droughts mapped from instrumental PDSI data (modified from Stahle et al., 2007).

Megadroughts

Droughts of unusually long duration are commonly referred to as "megadroughts," although there is no standard definition of the term (Stahle et al., 2007). This public information circular considers a megadrought to be any multi-year drought that significantly exceeds the duration of the most extreme droughts of the 20th century. Lasting 20 or more years, these extreme episodes do contain individual years of normal or even above-average precipitation.

Megadroughts appear to be most prevalent in Kansas between 850 AD and 1500 AD (fig. 7). The longest one occurred in north-central Kansas from 1317 to 1427. As north-central Kansas was enduring near-continuous drought for 110 years, northwestern Kansas experienced

two long-term droughts separated by a wetter period and southwestern Kansas conditions did not reach megadrought proportions (see fig. 6). These differences underscore how much circumstances can vary over a short distance.

Many of the known megadroughts in North America occurred during the **Medieval Warm Period** (MWP), a time of significant climatic variability that lasted from about 900 to 1300. First identified in northern Europe, the MWP was later documented in other areas of the world, including parts of the western United States (Cook et al., 2004). A shift around 1500 to droughts of shorter duration may coincide with the onset of cooler climatic conditions during a period known as the **Little Ice Age**. Many dune records from the central Great Plains show significant sand dune activation—a sign of increased aridity and reduced vegetation—during these periods. A variety of sand-dune mobilizations have been documented from the 9th to the early 20th century in Kansas (fig. 7).

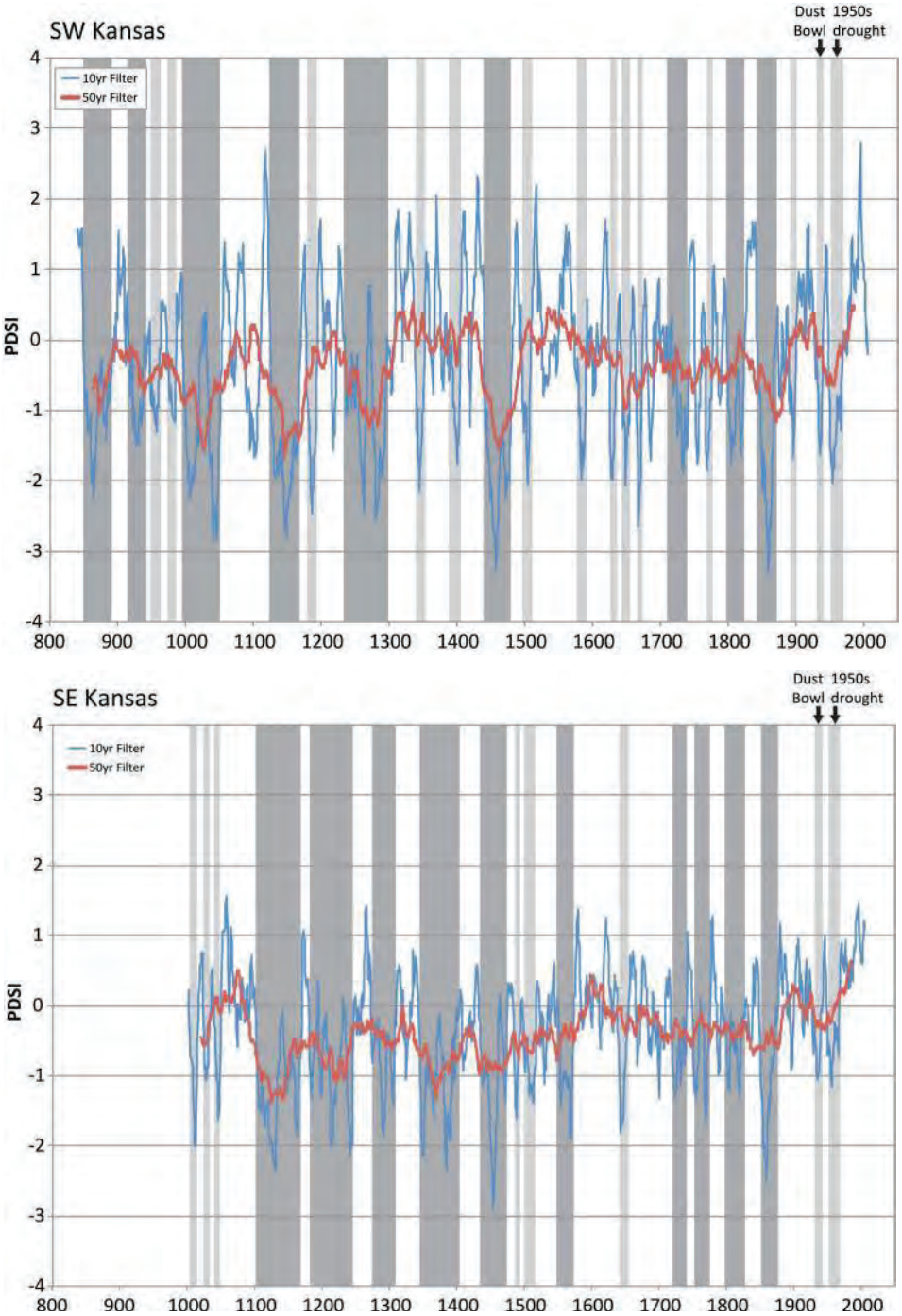


Figure 6—Smoothed PDSI reconstructions showing drought durations for southwestern Kansas (top) and southeastern Kansas (bottom). Light gray bars indicate episodes of similar duration to the 1930s and 1950s droughts and dark gray bars represent episodes of greater duration. Annual PDSI values have been smoothed to filter out anomalous high and low values over a 10-year range (blue) and a 50-year range (red) (Layzell, 2012). PDSI values are from Cook and Krusic, 2004. Reconstructions for all six Kansas regions are online at http://www.kgs.ku.edu/Hydro/Publications/2012/OFR12_18/index.html.

Archaeological and Historical Corroboration of Megadroughts

Evidence that megadroughts destabilized North American civilizations between 850 and 1500 AD is found in the archaeological record. Although drought probably affected populations in the Great Plains during that time, clues there are sparse. Archaeological evidence of agricultural societies in adjacent regions, however, provides signs of widespread drought conditions that most likely also afflicted the plains people.

Several major droughts may have undermined Native American cultures between the 11th and 15th centuries. The population of the Fremont cultures in the Four Corners region of the U.S. Southwest declined around 1000 AD in the midst of a multi-decade drought (fig. 7). The 13th-century drought commonly referred to as the "Great Drought" contributed to the abandonment of Anasazi agricultural settlements in the same region and also appears to have impaired Mississippian agricultural societies hundreds of miles to the northeast (Benson et al., 2007). Further megadroughts in the 14th and 15th centuries likely contributed to the abandonment of Cahokia near present-day St. Louis by 1450 (Cook et al., 2007).

Widespread drought during the Stephen Long expedition in 1819–1820 probably influenced the explorers' perception of the western Great Plains as the "Great American Desert." "The chief produce of these tracts of unmixed sand, is the sunflower, often the dense and almost exclusive occupant," wrote expedition member Edwin James. Jacob Fowler noted that on his way to Santa Fe in 1821, the sand hills along the Arkansas River in south-central Kansas were "distetute of vigetation as they are Bald" (Muhs and Holliday, 1995).

Set-tan (Little Bear) of the Kiowa recorded in his 60-year calendar history that during the hot "sitting summer" of 1855, the prairie grasses dried out and the Kiowa had to stop frequently to rest

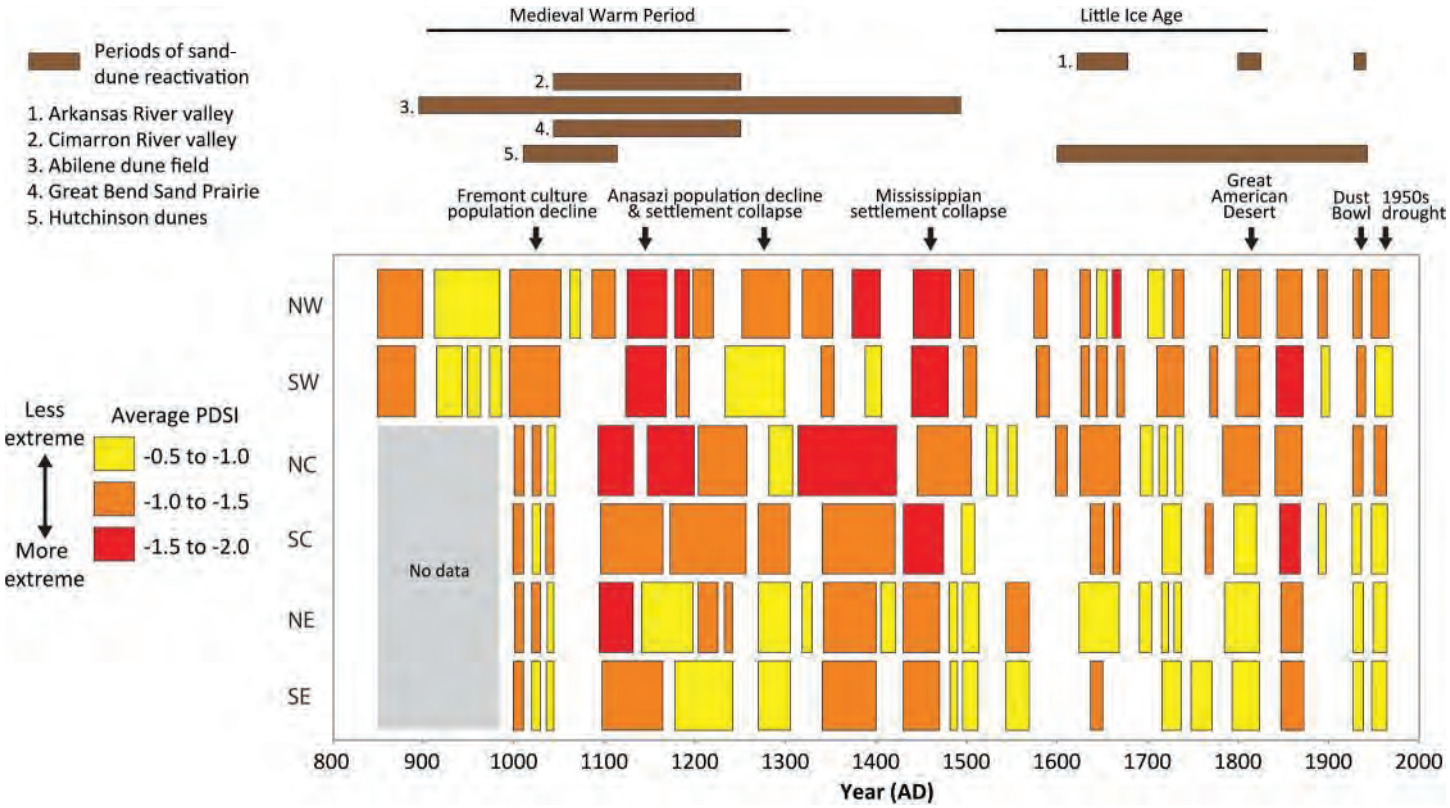


Figure 7—Synthesis of reconstructed PDSI data for the six regions of Kansas showing the severity and duration of droughts since about 850 AD. Events identified using geomorphic (sand dune), archaeological, and historical proxies are marked (Layzell, 2012). Sand-dune reactivation information from 1. Forman et al., 2008; 2. Lepper and Scott, 2005; 3. Hanson et al., 2010; 4. Arbogast, 1996; and 5. Halfen et al., 2012.

their emaciated horses (Stahle et al., 2007). Accounts from early settlers in eastern Kansas Territory also expounded on drought conditions that lasted from at least 1854 into the early 1860s, with only short reprieves. Newspapers reported suffocating dust storms, crop failures, prairie fires, "scorching, withering, blighting" winds, and the outward migrations of many newly arrived settlers (Malin, 1946). By the mid-1890s, locals around Garden City observed that area sand hills were becoming less extensive. Following brief reactivation of sand in small areas during the Dust Bowl years, dunes on the south side of the Arkansas River from just east of Pueblo, Colorado, to near Wichita are now mostly stabilized by vegetation (Muhs and Holliday, 1995).

Drought Risks, Water Resources, and Future Prospects

Paleoclimatic data collected for western Kansas indicate a drought as severe as the Dust Bowl occurs there, on average, three to four times a century. Based on that probability, there is a 35% chance for a severe drought year in any decade, a 70% chance within a 20-year span, and a 100% chance over the estimated 40-year working lifetime of a western Kansas farmer. Eastern Kansas averages about one such drought a century. In terms of duration, western Kansas averages two droughts a century spanning one decade or more.

As groundwater usage in western Kansas escalated, starting in the 1950s, the semi-arid region became even more susceptible to the effects of sustained drought. The High Plains aquifer system, which consists largely of the Ogallala aquifer, is the primary source of municipal, industrial, and irrigation water in western and central Kansas. In drought years, greater than normal amounts of groundwater are withdrawn from the aquifer to compensate for the lack of precipitation, particularly during the growing season. From 1996 to 2012, the overall average water level in the Kansas portion of the High Plains aquifer dropped 14 feet. Southwestern Kansas on its own experienced an average decline of 32.5 feet during that time. Under drought conditions in 2011 and 2012, water levels in southwestern Kansas declined 3.56 feet and 4.26 feet, respectively (Kansas Geological Survey, 2013).

The KGS continuously monitors three wells in the High Plains aquifer—in Thomas, Scott, and Haskell counties—and is correlating groundwater-level data from those wells with values from the PDSI and other drought climatic indices. Based on those correlations, researchers are able to predict how water levels would likely respond to increased pumping for irrigation and other uses under drought conditions similar to or greater than those in the 1930s and 1950s (Butler et al., 2013). (Live water-level readings from the wells can be accessed at http://www.kgs.ku.edu/HighPlains/HPA_Atlas/Index%20Well%20Program/#.)

Eastern Kansas depends mainly on surface water from federal reservoirs, the source of municipal and industrial water for more than two-thirds of the state's population. Sedimentation has diminished storage in most of these lakes over time, and a sustained period of drought could lead to unprecedented water shortages (Kansas Water Office, 2008).

Water systems and management plans are commonly designed to handle the "drought of record," that is, the most severe hydrological event documented in the instrumental record. For the state of Kansas, the drought years from 1952 to 1957 remain the planning

benchmark. Planning for a worst-case scenario of only a five-year duration, however, does not prepare the state for multi-decade megadroughts that modern-day agricultural and water systems—dependent on the state's limited groundwater and surface-water resources—may not have the resilience to withstand. Continued investigations into centuries of past climatic and drought variability will provide a clearer understanding of how climate and global warming affect aridity and will enable scientists and policymakers to better forecast droughts and plan for the sustainability of the state's groundwater and surface-water resources.

Glossary

Little Ice Age—Not a true ice age, this cooling period is loosely defined as lasting from about the 16th to mid-19th century, although its start and end dates are not fully agreed upon and its duration varies from location to location.

Medieval Warm Period—A climatic period lasting from about 900 to 1300 AD when average temperatures in Europe and adjacent regions of the North Atlantic are thought to have been equal to or greater than today's.

Paleoclimates—Climates that occurred before instrumental weather measurements were available and whose occurrence and patterns have been identified with evidence from tree rings, ice cores, and other proxies.

Proxy—Natural and human-made resources—such as tree rings, sedimentary deposits, archaeological artifacts, and historical journals—that have properties that date them to a specific time. Proxies can be used to determine climatic events that occurred before instrumental, direct-measurement records were kept.

References

Arbogast, A. F., 1996, Stratigraphic evidence for late-Holocene aeolian sand mobilization and soil formation in south-central Kansas, USA: Journal of Arid Environments, v. 34, p. 403–414.

Benson, L. V., Berry, M. S., Jolie, E. A., Spangler, J. D., Stahle, D. W., and Hattori, E. M., 2007, Possible impacts of early-11th-, middle-12th-, and late-13th-century droughts on western native Americans and the Mississippian Cahokians: Quaternary Science Reviews, v. 26, p. 336–350.

Butler, J. J., Jr., Whittemore, D. O., Bohling, G. C., Reboulet, E., Stotler, R., and Wilson, B. B., 2013, High Plains aquifer index well program—2012 annual report: Kansas Geological Survey, Open-File Report 2013-1, 127 p., http://www.kgs.ku.edu/Hydro/Publications/2013/OFR13_1/index.html.

Cook, E.R., and Krusic, P.J., 2004, North American Drought Atlas: Lamont-Doherty Earth Observatory and the National Science Foundation, http://iridl.ldeo.columbia.edu/SOURCES/.LDEO/.TRL/.NADA2004/.pdsi-atlas.html.

Cook, E. R., Woodhouse, C., Eakin, C. M., Meko, D. M., and Stahle, D. W., 2004, Long-term aridity changes in the western United States: Science, v. 306, p. 1,015–1,018.

Cook, E. R., Seager, R., Cane, M. A., and Stahle, D. W., 2007, North American drought: reconstructions, causes and consequences: Earth Science Reviews, v. 81, p. 93–134.

Forman, S. L., Marin, L., Gomez, J., and Pierson, J., 2008, Late Quaternary eolian sand depositional record for southwestern Kansas: Landscape sensitivity to droughts: Paleogeography, Paleoclimatology, Paleoecology, v. 265, p. 107–120.

Halfen, A. F., Johnson, W. C., Hanson, P. R., Woodburn, T. L., Young, A. R., and Ludvigson, G. A., 2012, Activation history of the Hutchinson dunes in east-central Kansas, USA, during the past 2200 years: Aeolian Research, v. 5, p. 9–20.

Hanson, P. R., Arbogast, A. F., Johnson, W. C., Joeckel, R. M., and Young, A. R., 2010, Megadroughts and late Holocene dune activation at the eastern margin of the Great Plains, north-central Kansas, USA: Aeolian Research, v. 1, p. 101–110.

High Plains Aquifer Atlas, 2012, Kansas Geological Survey: http://www.kgs.ku.edu/HighPlains/HPA_Atlas/index.html.

Hoerling, M., Quan, X., and Eischeid, J., 2009, Distinct causes for two principal U.S. droughts of the 20th century: Geophysical Research Letters, v. 36, L19708, doi:10.1029/2009GL039860.

Kansas Department of Agriculture, 2011, Kansas drought continues, production losses reach $1.7 billion: http://www.ksda.gov/news/id/405.

Kansas Geological Survey, 2013, Groundwater levels decline in western and central Kansas: http://www.kgs.ku.edu/General/News/2013/2013groundwaterlevels.html.

Kansas Water Office, 2008, Sedimentation in our reservoirs—Causes and solutions: Kansas Water Office, 143 p., http://www.kwo.org/reports_publications/reports/kwri_book.pdf.

Layzell, A. L., 2012, A thousand years of drought and climatic variability in Kansas—Implications for water resources management: Kansas Geological Survey, Open-File Report 2012–18, 23 p., http://www.kgs.ku.edu/Hydro/Publications/2012/OFR12_18/index.html.

Lepper, K., and Scott, G. F., 2005, Late Holocene eolian activity in the Cimarron River valley of west-central Oklahoma: Geomorphology, v. 70, p. 42–52.

Malin, J. C., 1946, Dust storms—Part one, 1850–1860: Kansas Historical Quarterly, v. 14, no. 2, p. 129–133.

Muhs, D. R., and Holliday, V. T., 1995, Evidence of active dune sand on the Great Plains in the 19th century from accounts of early explorers: Quaternary Research, v. 43, p. 198–208.

National Climatic Data Center, 2012, Billion-dollar U.S. weather/climate disasters 1980–2012: National Oceanic and Atmospheric Administration, http://www.ncdc.noaa.gov/billions.

NOAA, 2010, Paleoclimatology: http://www.ncdc.noaa.gov/paleo.

Schubert, S. D., Suarez, M. J., Region, P. J., Koster, R. D., and Bacmeister, J. T., 2004, On the cause of the 1930s Dust Bowl: Science, v. 303, p. 1,855–1,859.

Stahle, D. W., Fye, F. K., Cook, E. R., and Griffin, R. D., 2007, Tree-ring reconstructed megadroughts over North America since A.D. 1300: Climatic Change, v. 83, p. 133–149.

KU
KANSAS GEOLOGICAL SURVEY
The University of Kansas

The mission of the Kansas Geological Survey, operated by the University of Kansas in connection with its research and service program, is to conduct geological studies and research and to collect, correlate, preserve, and disseminate information leading to a better understanding of the geology of Kansas, with special emphasis on natural resources of economic value, water quality and quantity, and geologic hazards.

The Geology Extension program furthers the mission of the KGS by developing materials, projects, and services that communicate information about the geology of Kansas, the state's earth resources, and the products of the Kansas Geological Survey to the people of the state.

Public Information Circular 35
August 2013

Kansas Geological Survey
Geology Extension
The University of Kansas
1930 Constant Avenue
Lawrence, KS 66047-3724
785-864-3965
http://www.kgs.ku.edu

FOULSTON SIEFKIN LLP

Bank of America Tower, Suite 1400
534 South Kansas Ave.
Topeka, Kansas 66603-3436
785.233.3600
Fax 785.233.1610

MEMBER
LEX MUNDI: THE WORLD'S
LEADING ASSOCIATION
OF INDEPENDENT LAW FIRMS

ATTORNEYS AT LAW

1551 N. Waterfront Parkway, Suite 100
Wichita, Kansas 67206-4466
316.267.6371
Fax 316.267.6345
www.foulston.com

32 Corporate Woods, Suite 600
9225 Indian Creek Parkway
Overland Park, Kansas 66210-2000
913.498.2100
Fax 913.498.2101

MEMBER
iag
Integrated Advisory
Group International

WICHITA
CHARLES J. WOODIN
MIKEL L. STOUT
STANLEY G. ANDEEL
DARRELL L. WARTA
HARVEY R. SORENSEN
JAMES M. ARMSTRONG
CHARLES P. EFFLANDT
GARY L. AYERS
LARRY G. RAPP
JAY F. FOWLER
STEPHEN M. KERWICK
CHRISTOPHER M. HURST
TERRY C. CUPPS
JIM H. GOERING
WYATT A. HOCH
AMY S. LEMLEY
DOUGLAS L. HANISCH
TIMOTHY B. MUSTAINE
JEFFERY A. JORDAN
TRISHA A. THELEN
WILLIAM R. WOOD II
KEVIN J. ARNEL
CRAIG W. WEST
ERIC K. KUHN
JAY M. RECTOR
STEWART T. WEAVER
BOYD A. BYERS
DAVID E. ROGERS
TODD N. TEDESCO
HOLLY A. DYER
TIMOTHY P. O'SULLIVAN
DONALD D. BERNER
WILLIAM P. MATTHEWS
SHANNON D. WEAD
KARL N. HESSE
MICHAEL J. NORTON
SCOTT C. PALECKI
PATRICIA VOTH BLANKENSHIP
ANDREW J. NOLAN
FORREST T. RHODES, JR
JASON P. LACEY
KYLE J. STEADMAN
BROOKE BENNETT AZIERE
C. EDWARD WATSON, II
TERESA L. SHULDA
F. ROBERT SMITH
FRANCIS J. BAALMANN
MATTHEW W. BISH
DANIEL J. BULLER
SARAH E. BURCH
DOMINIC L. ECK
JOEL A. GRIFFITHS
CHARLES MCCLELLAN
ERIC M. PAULY
PHILLIP W. PEMBERTON
REBEKAH L. PINKSTON
PAIGE D. PIPPIN
SHARON E. RYE
ALEX W. SCHULTE
BRADLEY D. SERAFINE
JUSTAN R. SHINKLE
LINDSEY A. SMITH
RACHEL WETTA

OF COUNSEL
ROBERT L. HOWARD

SPECIAL COUNSEL
DAVID M. TRASTER
A. JACK FOCHT
GORDON G. KIRSTEN, II
J. STEVEN MASSONI
CYD GILMAN
SHANNON L. BELL

OVERLAND PARK
JAMES D. OLIVER
VAUGHN BURKHOLDER
WILLIAM P. TRENKLE, JR.
SCOTT C. NEHRBASS
WENDELL F. (BUD) COWAN
ISSAKU YAMAASHI
TOBY CROUSE
TARA S. EBERLINE
JOSHUA T. HILL
MATTHEW D. STROMBERG
JOHN C. PECK
JEFFREY B. HURT
JACK M. EPPS
ANTHONY F. RUPP

TOPEKA
JAMES P. RANKIN
THOMAS L. THEIS
CHARLES R. HAY
JEREMY L. GRABER
MARTA FISHER LINENBERGER

RETIRED
MARY KATHLEEN BABCOCK
WILLIAM H. DYE
RICHARD D. EWY
PHILLIP S. FRICK
FREDERICK L. HAAG
RICHARD C. HARRIS
JAMES K. LOGAN
R. DOUGLAS REAGAN
GERALD SAWATZKY

June 25, 2015

David Barfield, Chief Engineer
Brent Turney, Change Applications Supervisor
Division of Water Resources
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502-5000

Re: Hays/Russell Water Transfer – Change applications for water right files numbered: 21,729; 21,730; 21,731; 21,732; 21,733; 21,734; 21,841; 21,842; 22,325; 22,326; 22,327; 22,329; 22,330; 22,331; 22,332; 22,333; 22,334; 22,335; 22,338; 22,339; 22,340; 22,341; 22,342; 22,343; 22,345; 22,346; 27,760; 29,816; 30,083; and 30,084.

Dear David and Brent,

The Cities of Hays and Russell are preparing an application to transfer in excess of 2,000 acre-feet of water per year from the R9 Ranch in Edwards County to Schoenchen, Kansas, and then on to Hays and to Russell to supplement both Cities' inadequate municipal water resources. Water could also be available to other water utilities in the region and along the pipeline route.

A complete transfer application requires "contingently approved" change applications.[1] To that end, change applications and related documents for the water rights on the R9 Ranch listed above are attached. This letter provides substantive explanations for the requested changes and responds to a number of questions on the application that are common to all of the files. The content of this letter is incorporated into each change application.

The Cities respectfully request DWR's contingent approval of these applications.

[1] K.A.R. 5-50-7(b)(1)–(3). *See also* K.A.R. 5-50-2(x)(2)(A)–(C).

Table of Contents

Page

I. Legal and practical prerequisites to contingent approval of these change applications 3
A. Wheatland Elec. Co-op., Inc. v. Polansky 3
II. The Cities' alternative request for partial changes in the type and place of use 4
III. The necessity for an alternative approach to DWR's traditional reasonable-quantity analysis for municipal use 5
IV. Project Timing 7
V. Supplemental information for the Cities' change applications 7
A. Paragraph 2. Name of Applicants 8
B. Paragraph 3. The proposed changes are needed for the following reasons 8
1. Existing sources do not meet present needs—the City of Hays 8
2. Existing sources do not meet present needs—the City of Russell 10
3. Drought and the prospect of long-term mega-droughts 12
4. Reasonable per capita water use 12
5. Proximity to an adequate source matters 12
6. Average annual water use by Kansas municipalities 13
a. Water use is inversely proportional to annual precipitation 14
b. Per capita use by large Kansas utilities is much higher than small utilities 15
c. Other than Hays, larger cities in Region 5 need more water than smaller cities 16
d. Water use depends on access to adequate sources 18
7. Reasonable per capita water use-City of Hays 19
8. Reasonable per capita water use-City of Russell 20
C. Paragraph 5. The proposed place of use and other water rights that cover this place of use 23
D. Paragraph 7. The proposed points of diversion 23
E. Paragraphs 8, 9, and 10. Presently authorized points of diversion 25
F. Paragraph 11. Describe the current condition of and future plans for any point(s) of diversion that will no longer be used 26
G. Paragraph 13. Describe how consumptive use will not be increased 26
H. Paragraph 17. Attach documentation to show the proposed changes will not impair existing water rights and relate to the same local source of supply 27
I. Paragraph 18. Identify the rules and regulations for which you request a waiver 28
VI. Conclusion 29

I. Legal and practical prerequisites to contingent approval of these change applications

Because of the distance from the Ranch and the quantities of water involved, these applications can only become effective upon approval of a transfer pursuant to the Kansas Water Transfer Act.[2] A "complete" transfer application must include copies of the applications to change the place of use, the type of use, and the points of diversion that have been approved "contingent upon receiving a permit to transfer water."[3]

But this project will require much more than merely changing the characteristics of these water rights. Both Cities will invest significant time, resources, and money over several years, making vigilant front-end preparation a prerequisite to success. In addition to obtaining contingently approved change applications with rates, quantities, and terms acceptable to the Cities, numerous additional events must take place before the actual transfer of water from the Ranch can begin. These events include, for example:

- The complete design of required infrastructure, including collection and transmission systems;
- Acquisition of permits and approvals for road, railroad, pipeline, and stream crossings;
- Acquisition of easements and rights-of-way for the transmission pipeline;
- Securing project financing; and
- Construction of Phase 1 municipal wells, the collection system, the pipeline, and related infrastructure.

If a DWR order approving these change applications were to become effective immediately upon approval of the transfer application, several legal and practical problems would arise. Therefore, these and other conditions precedent to the movement of water to Hays and Russell must be included as "contingencies" in the Order approving these change applications.

A. *Wheatland Elec. Co-op., Inc. v. Polansky*

The irrigation rights on the Ranch are valuable and have even greater value to the Cities as municipal water sources. The Cities are committed to transferring water from the Ranch and believe that they can do so within the existing regulatory framework, but they cannot begin construction of a multi-million dollar project without the appropriate change and transfer orders in hand and only when events like those listed above come to fruition.

---

[2] K.S.A. 82a-1501, *et seq*.

[3] K.A.R. 5-50-7(b)(1)–(3). *See also* K.A.R. 5-50-2(x)(2)(A)–(C).

While the circumstances are very different, the Court of Appeal's decision in *Wheatland Elec. Co-op., Inc. v. Polansky*[4] raises a significant concern for the Cities. In that case, the Court affirmed DWR's decision to reject Wheatland's attempted withdrawal of its change application after the Chief Engineer issued an order that was not to Wheatland's liking. The Court recognized the Chief Engineer's authority to deny change applications that materially injure senior water-right holders and to grant applications on terms, conditions, or with limitations that are in the public interest, noting that under the circumstances of that case, "[i]t was not unreasonable or arbitrary for the Division not to allow Wheatland to withdraw its change application."[5]

Unlike the Cities' application, Wheatland's change applications were not contingently approved under the Water Transfer Act and were not contingent on any future events. Wheatland had already entered into a contract to supply water and treatment services to the City of Garden City and constructed its reverse osmosis treatment plant. When Wheatland found DWR's change order unacceptable, withdrawal was both legally and practically problematic.

While an outright denial of a change application or a new permit does not change the *status quo*, under *Wheatland* the approval of a change application for less than the requested amount, or with terms that are not acceptable to the applicant, has the potential to result in the loss of a valuable property interest.

If an order approving these change applications becomes effective as soon as an order approving the transfer is final but Hays determines that it cannot proceed with the project, the value of the Ranch would diminish substantially. In that case, the water rights could not be used for irrigation and there would be no way to get the water from the Ranch to Hays and Russell for municipal use. The water rights would be lost and the value of the Ranch would diminish from irrigated cropland to sand hills. That result would be a patently unfair result to the Cities and their citizens.

The Cities respectfully request a written agreement at the outset that any contingent approval of these change applications will include a provision allowing the Cities to withdraw the changes at any time, including after an order approving the transfer is final.

II. The Cities' alternative request for partial changes in the type and place of use

DWR regulations permit partial changes from irrigation to municipal use.[6] Each of the Cities' change applications requests a change of the total quantity available to municipal use. However, to the extent that the full amount available for municipal use is not converted,[7] the

---

[4] 46 Kan. App. 2d 746, 265 P. 3d 1194 (2011), review denied, 2013 Kan. LEXIS 472 (May 20, 2013) (No. 09-102881-A).

[5] *Wheatland*, 46 Kan. App. 2d at 753, 265 P.3d at 1201. *See also* K.S.A. 82a-708b(a), which makes the provisions and procedures for considering new applications applicable to change-application proceedings.

[6] K.A.R. 5-5-10.

[7] *See, e.g.*, K.A.R. 5-5-9(a)(6).

Cities request that any order approving any of the applications state that any quantity, in whole or in part, that is not made available for municipal use is to remain available for irrigation use.[8]

If DWR determines that some or all of the water otherwise available for municipal use should not be changed, the Cities reserve the right to amend their applications to add new points of diversion for irrigation use, to designate revised places for irrigation use,[9] and to allocate available rate between municipal and irrigation use.[10]

III. The necessity for an alternative approach to DWR's traditional reasonable-quantity analysis for municipal use

This project will provide a long-term supply of water to Hays, Russell, and possibly other communities in the region; is expected to have a design life of at least 50 years and to be productive for even longer; and financing for the project could require amortization over the entire design life of the infrastructure. For any number of reasons, including especially financing the project, DWR's traditional 20-year planning horizon, while workable for most other municipal water projects across the state, is not appropriate for the Cities' water-transfer project.

The Kansas Water Appropriation Act states that "[a]ppropriation rights in excess of the reasonable needs of the appropriators shall not be allowed."[11] And the regulations provide that changes in use are limited to the quantity actually consumed in any one year during the perfection period and, if necessary, further limited to the reasonable quantity needed for the new use.[12] DWR's 20-year planning horizon to establish the "reasonable needs" of municipal users is not mandated by DWR regulations. Indeed, DWR[13]—and Kansas courts[14]—have long recognized that "reasonableness" is fact and situation specific.

DWR's 20-year approach is appropriate for most municipal users across the State, principally because most users are close to sufficient quantities of water to meet their short, medium, and long-term needs.[15] For example, most communities in western Kansas overlie the

---

[8] K.A.R. 5-5-10.

[9] K.A.R. 5-5-10(b).

[10] K.A.R. 5-5-10(c).

[11] K.S.A. 82a-707(e).

[12] K.A.R. 5-5-9(a).

[13] While DWR has set quantity limits on various beneficial purposes including irrigation, K.A.R. 5-3-19, 5-3-20, 5-3-23, and 5-3-24; stockwatering, K.A.R. 5-3-22; and reservoir storage, K.A.R. 5-6-5, the quantities available for municipal use remain flexible.

[14] K.S.A. 82a-707(e) prohibits water rights that exceed the appropriator's "reasonable needs." The term "reasonableness" is not defined by the statute; however, in the context of riparian surface water rights, Kansas courts have long held that "reasonable use" requires a factual inquiry, and can only be "determined in the light of total supply and total need of all riparian proprietors." *State ex rel. Peterson v. Kan. State Bd. Agric.*, 158 Kan. 603, 608, 149 P.2d 604 (1944). The Kansas Supreme Court has also defined "reasonableness," in a different context, to be that which "from the calm sea of level common sense applied to the total situation, is not illegitimate in view of the end attained." *Ernest v. Faler*, 237 Kan. 125, 131, 697 P.2d 870 (1985) (citing *In re Hall*, 195 Pac. 975 (Cal. 1920)).

[15] *See* the Municipal Use Supplemental Sheet found at https://agriculture ks.gov/docs/default-source/dwr-water-appropriation-forms/1_100_24.pdf?sfvrsn=2 and K.A.R. 5-8-6(b).

Ogallala Aquifer, which means that irrigation rights are generally available nearby and can be acquired and converted to municipal use.[16]

In eastern Kansas, a range of possible options are available, including relatively abundant surface water in multiple reservoirs, the acquisition of existing rights, the Water Marketing Program, Water Assurance Districts, and PWWSDs.[17]

But unlike most other Kansas cities, Hays and Russell must look far afield to find a reliable source of water. The Cities have considered numerous alternative water sources, most recently Wilson Reservoir and the Smoky Hill River in eastern Russell County. Extensive hydrology and engineering studies have shown these alternatives are unworkable or too expensive.

As a practical matter, the Cities cannot afford to build a pipeline from Edwards County if it must leave some of the water on the Ranch or risk multiple transfer proceedings. In fact, it is unlikely that they can obtain long-term financing for a project for less than the full quantity of water available from the Ranch.

Moreover, the policy bases for the traditional 20-year limit either no longer exist at all or have significantly eroded—particularly in Groundwater Management District No. 5. The prior appropriation doctrine, adopted in Kansas in 1945,[18] has four key tenets.

- Priority of right—first in time is first in right;[19]
- All water may be appropriated, so long as it is used for beneficial purposes;[20]
- Water rights in excess of reasonable needs are not allowed;[21] and
- Water that is no longer put to the beneficial use must be relinquished to allow reappropriation by others.[22]

Two key developments have eroded the impact of these doctrines. First, DWR has closed many areas of the State, including the Ranch and surrounding areas, to new appropriations.[23]

---

[16] *See* Exhibit A, showing that the Ogallala Aquifer does not extend into either Ellis or Russell Counties. http://www kgs ku.edu/Publications/Bulletins/ED10/04_occur html.

[17] *See* the discussion under the heading "*Water use based on access to adequate sources*," *infra*.

[18] L. 1945, Ch. 390, § 1.

[19] K.S.A. 82a-706, 82a-706b, 82a-706e, 82a-707(b) and (c), 82a-708b, 82a-710, 82a-711, 82a-711a, 82a-715, 82a-716, and 82a-717a.

[20] K.S.A. 82a-703.

[21] K.S.A. 82a-707(e).

[22] As originally enacted and amended in 1957, K.S.A. 82a-718 permitted termination of water rights for non-use. L. 1957, Ch. 539, § 23. "Generally, after reverting to the public, the quantity of water forfeited is available to be reallocated to satisfy other junior water rights in the hydrological basin in order of priority date." Michael Toll, Comment, Reimagining Western Water Law: Time-Limited Water Right Permits Based on a Comprehensive Beneficial Use Doctrine, 82 U. Colo. L. Rev. 595, 626 (Spring 2011) ("The use requirement primarily played a role in reclaiming speculative claims from private ownership and returning them to the pool of unowned property, making them available for new, bona fide claimants."). *See also* David B. Schorr, *Appropriation as Agrarianism: Distributive Justice in the Creation of Property Rights*, 32 Ecology L.Q. 3, 22 (2005).

Second, the forfeiture of groundwater rights in closed areas is no longer authorized.[24] Because the R9 Ranch sits in an area that is closed to new applications, the water rights cannot be lost because of non-use and no new water will be made available for use by others if a portion of the available water is not converted to municipal use.

A longer planning horizon in this case is a practical necessity, is consistent with the overall purposes of Kansas water law and its underlying policies, and is in line with the Cities' reasonable needs. The Cities request an Order approving the change applications with a quantity that will float upwards as needs change and demand increases. These standards must be clear, objective, and not subject to the political or discretionary preferences of future Chief Engineers or Secretaries of Agriculture. They should be based on actual and projected population changes, the reasonable needs of additional users, and other measurable indices. The Cities believe that the details of such standards are best developed through a collaborative effort with DWR.

IV. Project Timing

The Cities currently plan to construct the water-transfer project in phases. Because the north side of the Ranch contains the most productive water rights, the Cities expect to convert those rights from irrigation to municipal use in the first phase. The Cities have already started to phase out irrigation on the Ranch. Many of the wells on the southwest end of the R9 Ranch have been plugged.[25]

The specific water rights and the total number of new municipal wells in the first phase will not be determined until completion of the design of the new collection and transmission system but could include files numbered 21,729; 21,730; 21,731; 21,732; 21,733; 21,734; 21,841; 21,842; and 29,816. *See* Section V.D. for a discussion of the Cities' proposed methods to determine the number and location of proposed wells.

The remaining R-9 Ranch water rights would be held in reserve until the need for water in Hays, Russell, and other potential water suppliers in the region justifies the change. Additional phases of the project will be completed as this demand increases.

Because the Cities anticipate a phased development of the water rights on the Ranch for municipal use, they request that the changes become effective as the need for municipal water increases. Stated another way, the Cities request that the water rights not converted to municipal use in the first phase remain available for irrigation use.

V. Supplemental information for the Cities' change applications

The numbered paragraphs below correspond to the paragraph numbers in DWR's change application form and are incorporated in each of the applications unless otherwise indicated.

---

[23] K.A.R. 5-25-4.

[24] K.S.A. 82a-718(e).

[25] This approach was made possible by the amendment of K.S.A. 82a-718, which removed the threat that these water rights could be lost in a forfeiture proceeding. *See* Section V.F.

A. Paragraph 2. Name of Applicants

Please direct all correspondence to the lawyers for the City of Hays on all issues related to the change applications as follows:

David M. Traster
Daniel J. Buller
Foulston Siefkin LLP
1551 N. Waterfront Parkway, Suite 100
Wichita, Kansas 67206-4466
Phone: 316-291-9725 (David); 316-291-9579 (Daniel)
Fax: 866-347-3138 (David); 866-347-9613 (Daniel)
dtraster@foulston.com; dbuller@foulston.com

In addition, please provide copies of all correspondence to:

Toby Dougherty
City Manager
City of Hays
P.O. Box 490
Hays, KS 67601

and

Jon Quinday
City Manager
City of Russell
133 W. 8th Street
Russell, Kansas 67665

B. Paragraph 3. The proposed changes are needed for the following reasons

1. Existing sources do not meet present needs—the City of Hays

The City of Hays owns water rights in the Smoky Hill River alluvium south of Hays, in the Big Creek alluvium in Hays, in the Dakota formation southwest of Hays, and is currently using water from a KDHE Dry Cleaner Trust Fund remediation project.[26]

Hays has water rights totaling an annual quantity of approximately 3,735[27] acre-feet, limited to no more than 3,675 acre-feet, and further limited by the Smoky Hill IGUCA.[28] But production from the City's wells is decreasing, and in recent years Hays has been unable to produce more than 2,000 to 2,200 acre-feet of water per year because of the significant depletion

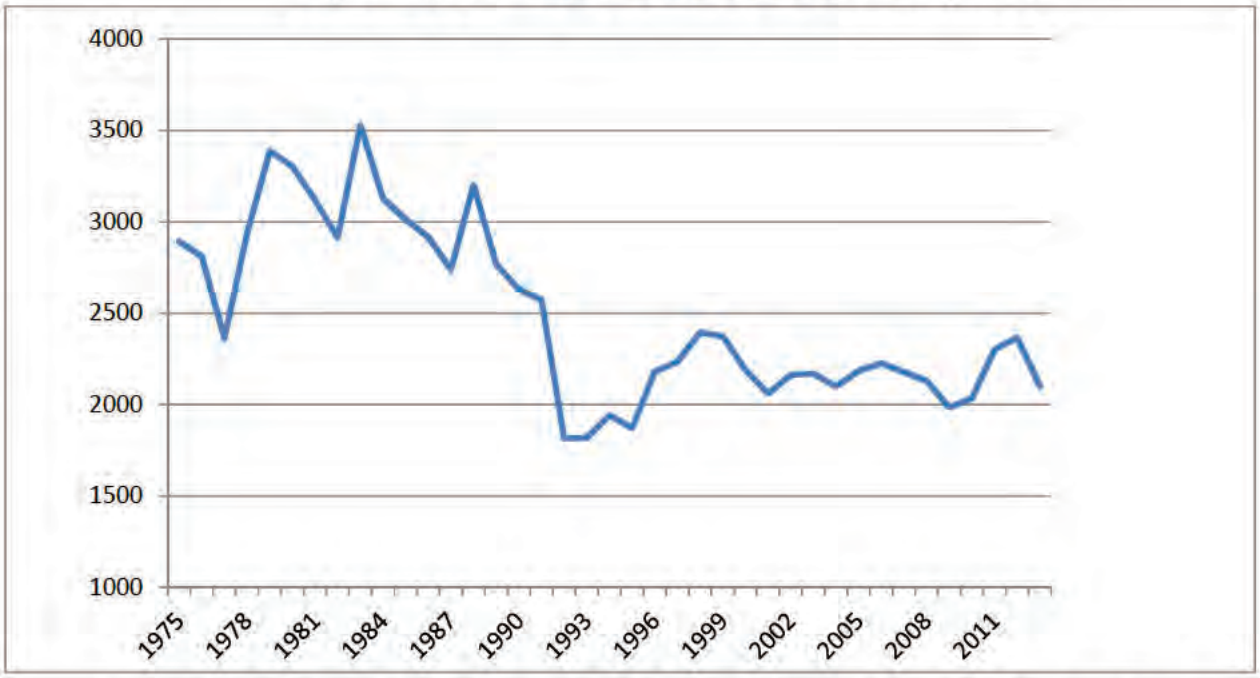
[26] Water from this source is being diverted under a temporary water appropriation right.

[27] Some of the later water appropriation rights held by the City of Hays include a limitation to a total quantity of 3,675 acre-feet when combined with other rights and the Smoky Hill water rights are limited by DWR's IGUCA.

[28] *See* Exhibit B.

of its Big Creek and Smoky Hill alluvial sources. Total municipal water use in Hays is shown in the following graph.

City of Hays Municipal Water Use in Acre-Feet per Year



Construction of Cedar Bluff Reservoir on the Smoky Hill River in Trego County and modern farming practices that significantly reduce runoff in the Smoky Hill basin have each contributed to the depletion of the City's water sources. This forced Hays to implement drought-induced conservation ordinances that drove homeowners to drill thousands of domestic wells in the Big Creek alluvium which, ironically, are now directly competing with Hays for the same water. This direct competition has impaired the City's water rights.

Hays has been the poster child for water conservation in Kansas since the early 1990s, when it imposed significant restrictions on water use. Hays is the only city in Kansas to adopt the green plumbing code and implement landscaping requirements that significantly limit the area and type of vegetation that is routinely grown and irrigated in other Kansas communities. To keep consumption rates low, Hays has enacted stringent water conservation measures, mandated the use of water-saving devices, and implemented a program that pays part of the owners' cost to purchase and install these devices.

In addition, both Hays and Russell have water-rate ordinances with increasing block structures. While the first gallon of water is relatively inexpensive, as consumption increases, so does the incremental rate. This approach has dramatically decreased the per capita water use by residents.

Hays residents have embraced these conservation efforts and taken pride in their accomplishments, but carrying the banner as the statewide leader in conservation has created a widely held perception that Hays lacks water. The City is at the effective limits of conservation for this part of the country. If Hays pushed even harder by adopting some of the draconian tactics

used by cities like Las Vegas and Phoenix, it would be thrust even farther away from its peer communities in Kansas, further repelling private and commercial investment.

Hays is the economic engine of Northwest Kansas; its continued growth and economic viability are crucial to the entire state. This is only possible if Hays has access to a water supply consistent with the reasonable expectations of citizens in other Kansas communities.

While abundant water does not guarantee that economic development will occur, development cannot occur without it. Hays has no interest in reverting to wasteful practices—conservation is, and will always be, a part of the culture in Hays. Instead, Hays is looking for additional water to ensure the long-term viability of the community and the region.

In order to grow, Hays must change the perception that it is short of water, which cannot be done until Hays changes the ***reality*** that it is short of water. Additional water resources will assure current and prospective businesses that water supplies meet and exceed current and long-term needs.

2. Existing sources do not meet present needs—the City of Russell

The discussion about Hays applies to the City of Russell as well. Russell is located in an arid climate where, like Hays, the evaporation rate exceeds the average annual rainfall.

Russell's water rights are designated with the following DWR file numbers: RS008; 1,267; 1,861; 7,628; 17,586; 17,587; and 36,680. These water rights provide Russell with the following quantities:

Cedar Bluff Reservoir	2,000 acre-feet	storage right
Smoky Hill River	1,086 acre-feet	surface water
Smoky Hill River	961 acre-feet	groundwater
Fossil Lake	410 acre-feet	surface water
Big Creek	1,767 acre-feet	surface water

While the City of Russell has water rights totaling an annual quantity of approximately 5,814 acre-feet, it is limited to no more than 1,840 acre-feet per year from all sources combined.

Moreover, these sources are highly susceptible to drought. Big Creek is particularly unreliable because it frequently runs dry during the summer months. The Pfeifer well field is capable of supplying the water demand for a very short duration but could be permanently damaged if demand increases too much.

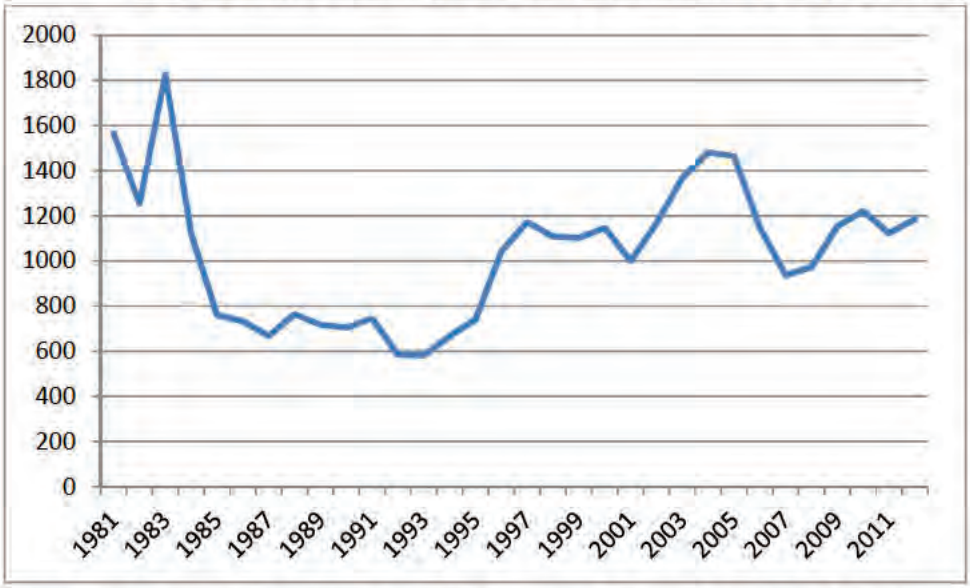
Russell has been able to manage its two main water sources effectively, but water use has been highly restricted over the last 12 years. Russell has been in a Stage 3 Critical Water Stage or Stage 4 Water Emergency for 8 consecutive years.

The City of Russell and its citizens have responded to the City's warnings about their water supply and have significantly reduced their consumption. The industrial sector was able to reduce water consumption by 63% over 10 years. The residential/commercial sector was able to reduce their water consumption by 30% over the same time period. The exemplary conservation

efforts have been well documented in the media.[29] In fact, in 2013, Russell's total water consumption dropped by 22 percent over the previous five years, with more than one-third of its residents using rain barrels to collect and reuse rainwater.[30]

Russell's water use peaked in the early 1980s, then dropped off precipitously in the mid-1980s.

City of Russell Municipal Water Use in Acre-Feet per Year



Russell's governing body recognizes the importance and scarcity of water in this region. In addition to investing in infrastructure, Russell looked to its neighbors to the west and their conservation efforts. In 2013, the City of Russell began offering free low-flow showerheads to its customers and implemented a new water-conservation education program for middle school science classes.[31] In 2014, Russell implemented a water-conservation rebate program, which promoted the purchase and proper installation of high-efficiency toilets.

As with other cities in this region, Russell must change the perception that it is short of water. This cannot be accomplished until it changes the reality that it is short of water. A reliable, sustainable, 100-year water source will assure current and prospective residents and businesses that Russell can sustain current and long-term needs.

---

[29] Rick Montgomery, *Capturing Every Drop: Russell, Kan., Learns to Live with Drought*, The Kansas City Star (June 1, 2014), http://www kansascity.com/news/state/kansas/article446882/Capturing-every-drop-Russell-Kan.-learns-to-live-with-drought html. *See also Kansas Community Launches Educational Campaign to Help Promote Water Conservation*, AM Conservation Group (Jan. 20, 2014), http://www.amconservationgroup.com/blog/kansas-community-launches-educational-campaign-to-help-promote-water-conservation; Associated Press, *Russell seeks to conserve water* (July 11, 2012), http://cjonline.com/news/2012-07-11/russell-seeks-conserve-water.

[30] Montgomery, *Capturing Every Drop*, *supra* note 33.

[31] http://www.amconservationgroup.com/blog/kansas-community-launches-educational-campaign-to-help-promote-water-conservation.

3. Drought and the prospect of long-term mega-droughts

Historically, the water shortages in Hays and Russell have been cyclical. But the drought that started in 2010 has been extremely hard on the Cities' water sources and water shortages are now part of Hays' and Russell's daily life. Though those shortages become extreme during droughts, the Cities have entered a "new norm" that will extend beyond the current situation. In fact, with changing rainfall patterns and new farming practices it is hard to envision a time when the available alluvial aquifers will ever produce the quantities authorized or even sufficient quantities to meet the Cities' existing and future needs.

A recent Kansas Geological Survey ("KGS") article that analyzed paleoclimatological data concluded that "*we should expect decadal droughts on average two times a century in western Kansas*."[32] More severe droughts will tax existing systems beyond their ability to cope; both Cities must take steps to protect their citizens from future droughts.

4. Reasonable per capita water use

Extreme conservation, while laudable, is not the standard on the High Plains and is not conducive to economic-development efforts. Hays and Russell residents have sacrificed in ways that other Kansans have not. The Cities should not have to maintain this strict conservation once a new source of water becomes available. Instead, the communities' reasonable needs must balance the virtues of conservation with the reasonable expectations of other Kansas communities. Moreover, existing and prospective businesses have a legitimate interest in how water is used in their communities. Water use affects lifestyle which, in turn, affects employers' ability to attract new employees and the Cities' efforts to attract new employers.

5. Proximity to an adequate source matters

DWR considers significantly higher per capita water use quantities to be reasonable for municipal use in other areas of the State—in fact, in ***all*** other areas of the State. A reasonable quantity in Hays and Russell should not be different than the reasonable quantities in Dodge City,[33] Pratt,[34] or Larned.[35]

As shown in Table 1, every Kansas county with a population in excess of 15,000 in the 2010 census—except Ellis County—is (a) on or east of U.S. Highway 81, the traditional dividing line between eastern and western Kansas; (b) over or near a major aquifer; or (c) both.

Russell is even more isolated from viable sources. While it has very slightly more annual rainfall than Hays, its smaller size makes the economics of a long-distance pipeline more problematic.

---

[32] Anthony L. Layzell, A thousand years of drought and climatic variability in Kansas: Implications for water resources management, Kansas Geological Survey, 2012, p. 10 (emphasis in original).

[33] Dodge City averaged 199 GPCD during 2007–2011. DWR's 2011 Municipal Water Use Report ("Report"), p. available at: http://agriculture ks.gov/docs/default-source/dwr-water-appropriation-documents/2011_ks_municipal_water_use.pdf ?sfvrsn=2.

[34] Pratt averaged 195 GPCD during 2007-2011. *Id.*, p. 18.

[35] Larned averaged 203 GPCD during 2007-2011. *Id.*, p. 13.

Table 1				
County	Population in 2010 Census	East of Highway 81	On Highway 81	Has access to a major aquifer
Johnson	544,179	X		
Sedgwick	498,365		X	Equus Beds
Shawnee	177,934	X		
Wyandotte	157,505	X		
Douglas	110,826	X		
Leavenworth	76,227	X		
Riley	71,115	X		
Butler	65,880	X		
Reno	64,511			Equus Beds
Saline	55,606		X	
Crawford	39,134	X		
Finney	36,776			Ogallala
Cowley	36,311	X		
Montgomery	35,471	X		
Harvey	34,684		X	Equus Beds
Geary	34,362	X		
Ford	33,848			Ogallala
Lyon	33,690	X		
Miami	32,787	X		
McPherson	29,180		X	Equus Beds
Ellis	28,452			
Barton	27,674			Ogallala
Franklin	25,992	X		
Sumner	24,132		X	
Seward	22,952			Ogallala
Labette	21,607	X		
Pottawatomie	21,604	X		
Cherokee	21,603	X		
Dickinson	19,754	X		
Jefferson	19,126	X		
Atchison	16,924	X		
Neosho	16,512	X		
Osage	16,295	X		
Bourbon	15,173	X		

6. Average annual water use by Kansas municipalities

The reasonable quantity of water needed for municipal use in Kansas is dependent on average annual rainfall, proximity to a source, and population. More rainfall reduces water needs, and larger cities use more water per capita than smaller cities. DWR has deemed larger quantities to be "reasonable" in communities that have abundant supplies.

The following analysis demonstrates that a reasonable quantity of water for municipal use in Hays is about 200 gallons per capita per day ("GPCD").

DWR publishes an annual report on municipal water use in Kansas. The report divides the state into eight separate water-use "regions."[36] Based on average annual precipitation and on per capita use, the report compares average use by water utilities in each of these similar geographic areas.[37]

Region 1 is the western-most tier of counties and Region 8 is the two eastern-most tier.[38] Hays is located in Region 5; Russell is in Region 6.[39]

Regions 7 and 8 are subdivided into small, medium, and large utilities with large utilities serving more than 10,000 people.[40] Hays would fit in the "large" category if Region 5 were so divided but would be the only such utility in that group.[41] Region 6 is divided into small and medium-large cities; Russell is in the medium-large category.[42]

a. Water use is inversely proportional to annual precipitation

The Report asserts that GPCD use is much higher in the west than in the east "primarily due to differences in precipitation."[43] Average annual precipitation in Region 1 (the far western tier of counties) ranges from below 18 inches to 21 inches.[44] Average annual precipitation in Region 8 (the two eastern tiers) is roughly double the rainfall in Region 1, ranging from 36 inches to over 45 inches.[45]

The following Table 2 is taken from the 2011 Report.[46] The fact that per capita water use declines from west to east is the most-apparent conclusion from this data.

---

[36] *Id.*, p. 38.

[37] *Id.*, p. 3.

[38] *Id.*, p. 38.

[39] *Id.*

[40] *Id.*, p. 4.

[41] *Id.*

[42] *Id.*

[43] *Id.*, p. 3.

[44] *Annual Normal Precipitation, 1971–2000*, prepared by the Kansas Department of Agriculture, Administrative Services, October 30, 2009. http://agriculture ks.gov/docs/default-source/dwr-water-appropriation-documents/precip7100_3in.pdf.

[45] *Id.* There are two small areas, one in northwest Brown County and the other in eastern Doniphan County, that dip below 36 inches per year.

[46] 2011 Report, p. 4.

Table 2 AVERAGE GPCD USE FOR KANSAS PUBLIC WATER SUPPLIERS BY REGION AND SIZE, 2007–2011						
Region	Year					Average
	2007	2008	2009	2010	2011	
1	272	273	228	259	282	263
2	245	241	199	224	237	229
3	241	229	195	223	229	223
4	170	168	156	168	196	172
5	149	142	139	137	149	143
6-ML	135	133	131	139	151	138
6-S	126	121	117	114	134	122
7-L	135	128	124	134	140	132
7-M	101	96	94	98	103	98
7-S	92	89	87	87	93	90
8-L	130	123	122	125	130	126
8-M	98	92	89	93	94	93
8-S	82	81	78	79	81	80
Kansas	119	115	109	114	122	116

b. Per capita use by large Kansas utilities is much higher than small utilities

For the period 2007–2011, large water utilities in Region 8 used 135% of the quantities used by medium utilities in that Region and 158% of the quantity used by small utilities. In Region 7, large utilities needed between 135% and 147% as much water as medium and small utilities.

Table 3		
Region	Average GPCD from Table 1	Percent of 7-L and 8-L
7-Large	132	132 GPCD is 135% of use in 7-Medium and 147% of use in 7-Small Communities
7-Medium	98	
7-Small	90	
8-Large	126	126 GPCD is 136% of use in 8-Medium and 158% of use in 8-Small Communities
8-Medium	93	
8-Small	80	

Table 4 summarizes the comparison of water use in Hays from 1993 through 2012 to the average use in Regions 5, 6-ML, 7-L, and 8-L for that same period.[47] Conservation measures enacted by the City of Hays resulted in average water use that is 14.9%–42.7% lower than large users in all of the Regions to the east even though that per capita water needs decline as average rainfall increases from west to east.

[47] Data was extracted from several Annual Reports that were provided by DWR.

Table 4									
	Hays GPCD 1993–2012	Region 5 Average GPCD 1993–2012	Percent Below Regional Average	Region 6-ML Average GPCD 1993–2012	Percent Below Region 6- ML Average	Region 7-L Average GPCD 1993–2012	Percent Below Region 7-L Average	Region 8-L Average GPCD 1993-2012	Percent Below Region 8-L Average
Highest	112		-26.0%		-24.5%		-20.8%		-14.9%
Lowest	85	151.35	-43.8%	148.35	-42.7%	141.4	-39.9%	131.65	-35.4%
Average	97		-35.7%		-34.4%		-31.2%		-26.1%

c. Other than Hays, larger cities in Region 5 need more water than smaller cities

Even though Hays is the only "large" user in Region 5 and "large" utilities need between 135% and 158% more water than medium and small users, its average use is far lower than the average water use in its own Region 5. In fact, as shown in Tables 5, 6, and 7, the average GPCD water use in Hays from 2007 through 2011 is lower than any of the Region 5 utilities that would be considered "medium" and lower than all but 5 of the 23 "small" providers.

The following tables show the GPCD for all cities in Region 5 for which 2010 population figures were available, sorted by size.[48] Average need during 2007–2011 for "medium" sized cities was 153.5 GPCD; "small" cities averaged 128.5 GPCD. In Regions 7 and 8, large utilities need 135% of the water used by medium utilities and 152% of the water needed by small utilities. If Hays had access to plentiful water, it would normally use in the range of 200 GPCD instead of just 93 GPCD.[49]

[48] *See* http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml#none. Data were not available for the Rural Water Districts, the City of Belvidere, or "Hays City Suburban."

[49] 153.5 GPCD used by medium sized utilities in Region 5 times 135% equals 207 GPCD; 128.5 GPCD used by small utilities in Region 5 times 152% equals 195 GPCD.

Table 5								
	2010 Population	Region	2007	2008	2009	2010	2011	Average
Hays	**20,510**	**5**	**96**	**92**	**85**	**91**	**99**	**93**

Table 6								
Cities with population between 500 and 9,999								
	2010 Population	Region	2007	2008	2009	2010	2011	Average
Larned	4054	5	211	203	176	200	225	203
Phillipsburg	2581	5	195	130	121	114	139	140
Ellis	2062	5	90	93	91	97	101	94
Plainville	1903	5	134	123	130	146	149	136
Kinsley	1457	5	119	128	121	118	126	122
La Crosse	1342	5	127	123	125	139	145	132
Stockton	1329	5	149	114	98	101	115	115
Victoria	1214	5	107	107	95	105	110	105
Coldwater	828	5	178	165	189	208	226	193
Greensburg	777	5	223	173	242	259	309	241
Haviland	701	5	169	185	154	154	174	167
Logan	589	5	172	173	134	167	174	164
Protection	514	5	176	180	194	175	196	184
Average Annual GPCD			**157.7**	**145.9**	**143.8**	**152.5**	**168.4**	**153.5**

Table 7								
Region 5 Cities with population below 500								
	2010 Population	Region	2007	2008	2009	2010	2011	Average
Lewis	451	5	117	138	114	136	154	132
Otis	282	5	204	184	136	152	268	189
Palco	277	5	140	118	106	126	111	120
Agra	267	5	103	89	91	101	115	100
Bison	255	5	0	78	94	89	74	84
Mullinville	255	5	211	266	206	242	266	238
Burdett	247	5	151	191	134	169	178	165
Schoenchen	207	5	0	0	0	0	72	72
Offerle	199	5	152	101	135	158	183	146
McCracken	190	5	72	78	77	82	67	75
Kirwin	171	5	98	90	82	146	125	108
Rush Center	170	5	110	116	135	140	155	131
Rozel	156	5	156	161	150	230	238	187
Woodston	136	5	222	255	250	157	92	195
Long Island	134	5	196	180	210	193	202	196
Prairie View	134	5	144	159	123	107	133	133
Damar	132	5	0	0	0	119	100	110
Liebenthal	103	5	75	78	66	63	78	72
Glade	96	5	123	106	99	124	69	104
Belpre	84	5	110	109	107	130	174	126
Timken	76	5	125	69	47	59	67	73
Alexander	65	5	100	78	93	114	99	97
Speed	37	5	99	89	129	87	109	103
Average Annual GPCD			**117.7**	**118.8**	**112.3**	**127.1**	**136.0**	**128.5**

d. Water use depends on access to adequate sources

One cause of the disparity in water use in Region 5 is distance from the water source. Utilities in Region 5 that use the most water are located near sources that are adequate for the population served. The following table shows the average GPCD for 2007 through 2011 for the 12 communities in Region 5 that use the most water. In each case, there is an abundant supply of water nearby.

Table 8			
City	Average GCPD 2007–2011	2010 Population	Assumed Source
Greensburg	241	777	High Plains Aquifer
Mullinville	238	255	High Plains Aquifer
Larned	203	4054	High Plains Aquifer and the Arkansas River alluvium
Long Island	196	134	Prairie Dog Creek alluvium and High Plains Aquifer
Woodston	195	136	Alluvium of the South Fork of the Solomon River
Coldwater	193	828	High Plains Aquifer and the Calvary Creek alluvium
Otis	189	282	Walnut Creek alluvium
Rozel	187	156	Alluvia of the Pawnee River and Sawmill Creek and the High Plains Aquifer
Protection	184	514	Alluvia of the Cimarron River and Kiowa Creek
Haviland	167	701	High Plains Aquifer
Burdett	165	247	Pawnee River alluvium and possibly the High Plains Aquifer
Logan	164	589	Alluvium of the North Fork of the Solomon River

At the other end of the spectrum are the 12 communities in Region 5 that use the least amount of water. They are all in Ellis, Phillips, or Rush Counties, where both surface and groundwater are scarce.

Table 9			
City	County	Average GCPD 2007–2011	2010 Population
Victoria	Ellis	105	1214
Glade	Phillips	104	96
Speed	Phillips	103	37
Agra	Phillips	100	267
Alexander	Rush	97	65
Ellis	Ellis	94	2,062
Hays	Ellis	93	20,510
Bison	Rush	84	255
McCracken	Rush	75	190
Timken	Rush	73	76
Schoenchen	Ellis	72	207
Liebenthal	Rush	72	103

7. Reasonable per capita water use-City of Hays

At a minimum, Hays is entitled to plan future water use based on the Region 5 average of 143 GPCD; but in fairness, the average should be increased because with populations below 500 are included in the average. When those small communities are excluded from the calculation, Hays should be able to plan based on at least 153.5 GPCD.

Hays' estimated cost to produce from current sources 1,000 gallons of water is about $1.60. Water transferred from the Ranch will cost more, and could approach $5.00 per 1,000 gallons. This high cost will undoubtedly deter waste by water consumers in Hays.

8. Reasonable per capita water use-City of Russell

Russell's reported per capita water use falls near the middle of medium-large cities in Region 6. But this presents an inaccurate picture of water use in Russell.

The City of Russell has two principle sources of water: Big Creek surface water and groundwater from the Pfeifer well field. Big Creek surface water is transported in a 16-inch line from the Big Creek pump station to a surface water treatment plant in Russell 22 miles away. Water from each of several wells in the Pfeifer well field flows into a common "collector well."[50] Water is then pumped out of the collector well and transported in an 18-inch line to an electrodialysis reversal water treatment plant ("EDR plant") in Russell. Both lines are shown on Exhibit C.

Each of the Pfeifer wells is metered, as is the water withdrawn from the collector well and pumped to Russell. There are significant losses from the collector well but that water is not lost. All of the wells are located near the Smoky Hill River as shown on Exhibit C. They draw water from the alluvium, and losses from the collector well return to the alluvial aquifer.

The following table shows the actual GPCD for the City of Russell from 2007–2014. After removing the quantity of water lost in the collector well, the average water use in Russell for this period was just 102.8 GPCD. At the depth of the drought in 2013, usage dipped to 78.6 GPCD.

[50] The "collector well" was originally designed as a Ranney collector well. It is now used to collect water from the well field and as a pump station.

Table 10 (1000s)								
	2007	2008	2009	2010	2011	2012	2013	2014
Raw Surface Water from Big Creek	233,585	151,361	233,548	235,666	186,446	119,504	125,836	173,561
Raw Groundwater from Pfeiffer Wells	71,747	172,019	142,242	162,334	179,291	267,262	119,129	153,728
Total Raw Water Diverted	305,331	323,380	375,790	398,000	365,737	386,766	244,965	327,288
Metered Quantity Diverted from Pfeiffer Collector Well	57,002	122,335	97,797	115,894	127,695	180,049	87,758	109,662
Raw Surface Water from Big Creek	233,585	151,361	233,548	235,666	186,446	119,504	125,836	173,561
Untreated Water Delivered to Russell Treatment Plants	290,587	273,696	331,345	351,560	314,141	299,553	213,594	283,223
Difference between Pfeifer Wells and Quantity from Pfeifer Collector Well	14,745	49,684	44,445	46,440	51,596	87,213	31,371	44,066
Water Sold to Industrial, Stock, and Bulk Customers	138,500	115,315	144,277	147,069	133,661	138,513	85,176	105,295
Water Sold to Residential and Commercial Customers	127,625	122,388	123,343	124,806	131,012	119,999	108,382	108,743
Other Metered Water	18,710	19,189	18,907	19,786	22,150	23,421	17,677	19,944
Total Metered Water	284,835	256,892	286,527	291,661	286,823	281,933	211,235	233,982
Total Quantity Not Accounted For	20,496	66,488	89,263	106,339	78,914	104,833	33,730	93,306
Water Loss in Collector Well	14,745	49,684	44,445	46,440	51,596	87,213	31,371	44,066
Actual Quantity Not Accounted For	5,752	16,804	44,818	59,899	27,318	17,620	2,359	49,241
Percent Total Raw Water Diverted Not Accounted For	1.9%	5.2%	11.9%	15.1%	7.5%	4.6%	1.0%	15.0%
Population	4522	4514	4506	4498	4490	4482	4474	4475
Residential, Commercial, Other Metered, and Unaccounted for Water	152,087	158,381	187,068	204,491	180,480	161,040	128,418	177,928
GPCD	92.14	96.13	113.74	124.56	110.13	98.44	78.64	108.93

As shown in Table 11, the actual per capita water use places Russell very near the bottom of the list for medium to large cities in Region 6ML.

Table 11							
		2007	2008	2009	2010	2011	Ave.
Attica	6ML	179	215	200	245	272	222
Mitchell Co. RWD #02	6ML	215	190	193	197	193	198
Pratt	6ML	184	192	187	203	210	195
Lyons	6ML	189	180	161	173	253	191
Medicine Lodge	6ML	201	199	164	179	180	185
Mankato	6ML	171	170	205	189	184	184
Kiowa	6ML	166	184	172	163	157	168
Downs	6ML	141	160	166	160	149	155
Smith Center	6ML	138	146	162	158	168	154
South Hutchinson	6ML	156	130	155	151	173	153
Osborne	6ML	157	159	136	124	144	144
St. John	6ML	136	135	123	154	166	143
Little River	6ML	136	119	142	158	149	141
Russell (reported)	6ML	107	133	151	166	146	141
Russell Co. RWD #03	6ML	130	127	121	162	153	139
Anthony	6ML	156	128	130	131	139	137
Harper	6ML	129	119	121	139	165	135
Lincoln Center	6ML	141	138	142	136	114	134
Claflin	6ML	131	117	123	134	158	133
Hutchinson	6ML	126	110	111	165	155	133
Rice Co. RWD #01	6ML	122	168	na	109	133	133
Macksville	6ML	122	132	133	140	135	132
Pretty Prairie	6ML	130	125	136	129	142	132
Haven	6ML	137	120	119	124	140	128
Ellsworth	6ML	132	128	130	127	117	127
Stafford	6ML	133	118	114	121	151	127
Buhler	6ML	117	111	120	130	143	124
Great Bend	6ML	131	130	120	117	122	124
Kingman	6ML	114	108	114	129	131	119
Wilson	6ML	108	104	106	110	109	107
Russell (actual)		92	96	114	125	110	107
Ellinwood	6ML	101	100	97	108	125	106
Hoisington	6ML	97	98	94	98	113	100
Beloit	6ML	90	80	84	84	126	93
Sterling	6ML	92	82	82	95	107	92
Nickerson	6ML	67	86	69	68	84	75
Barton Co. RWD #02	6ML	47	57	37	45	60	49

At a minimum, Russell is entitled to plan future water use based on the Region 6ML average of 138 GPCD excluding any quantity lost to the aquifer in the Pfeifer collector well.[51]

C. Paragraph 5. The proposed place of use and other water rights that cover this place of use

Subject to the discussion in Section 1, *supra*, the Cities request that the places of use for these water rights be changed to correspond with the currently authorized places of use for their existing municipal rights. Maps showing the Hays and Russell corporate city limits are attached to the change applications.

Water rights owned by the City of Hays: EL 002; 1,248; 5,757; 18,857; 18,858; 33,296; 33,548; 36,519; 36,520; 36,804; 40,367; 40,368; 40,702; 40,703; 40,704; 40,705; 40,706; and 40,707.

Exhibit B provides an overview of the authorized quantities of water for each of the City's existing municipal wells. Many of the wells are not capable of producing the authorized quantities.

Water rights owned by the City of Russell: RS008; 206; 1,267; 1,861; 7,628; 17,586; 17,587; 36,680; and 20139006.

R9 Ranch water rights owned by the Cities of Hays and Russell: 21,729; 21,730; 21,731; 21,732; 21,733; 21,734; 21,841; 21,842; 22,325; 22,326; 22,327; 22,329; 22,330; 22,331; 22,332; 22,333; 22,334; 22,335; 22,338; 22,339; 22,340; 22,341; 22,342; 22,343; 22,345; 22,346; 27,760; 29,816; 30,083; and 30,084.

While these water rights do not presently cover the authorized places of use for Hays and Russell, approval of the attached applications, the transfer application, and the construction of a collection and distribution system will eventually cause these water rights to completely overlap with each of the Cities' existing municipal rights.

D. Paragraph 7. The proposed points of diversion

As discussed above, the Cities' applications are filed in order to comply with DWR regulations requiring contingently approved change applications before a transfer application will be deemed complete.[52] Moreover, the statute and the regulations require that a transfer applicant provide a "proposed plan of design, construction, and operation" of the collection and transmission system that is in "sufficient detail to enable all parties to understand the impacts of the proposed water transfer."[53]

While the Cities will comply with the requirement to provide their plans to design, construct, and operate the system, neither the statute nor the regulation require a full set of detailed plans and specifications at this stage of the proceedings.

---

[51] *See* Table 2, *supra*.

[52] K.A.R. 5-50-2(x)(2) and 5-50-7(b).

[53] K.S.A. 82a-1502(c)(6) and K.A.R. 5-50-2(g).

Nor does the transfer act require that the Cities specifically identify the precise points of diversion.[54] Instead, it only requires sufficient detail to enable the parties to determine the "impact" of the transfer, which means the "impact" to the State as a whole. The statute states:

> (c) To determine whether the benefits to the state for approving the transfer outweigh the benefits to the state for not approving the transfer, the presiding officer shall consider all matters pertaining thereto, including specifically:
>
> . . .
>
> (6) the proposed plan of design, construction and operation of any works or facilities used in conjunction with carrying the water from the point of diversion, which plan shall be in sufficient detail to enable all parties to understand the impacts of the proposed water transfer."[55]

Transfer act regulations require the same information in the transfer application.[56] In addition, "to be complete," the transfer application must show "the location of the proposed point or points of diversion."[57] However, the regulations go on to allow the Chief Engineer to waive the requirement that a "complete" application include the precise point of diversion. The regulation states:

> Unless this requirement is waived by the chief engineer for good cause, a water transfer application shall not be considered complete until one of the following has been approved contingent upon receiving a permit to transfer water: . . .
>
> (b) an application for a change in any or all of the following:
>
> (1) point of diversion;
>
> (2) place of use; or
>
> (3) use made of water filed pursuant to the KWAA . . ..[58]

The Cities are preparing studies and preliminary plans. The Cities will be consolidating wells but need to make sure that there is sufficient well capacity to divert the full quantity available from each water right on the Ranch. Without further investigation and more detailed design work, the Cities cannot be certain of either the location or the number of wells needed to support the transfer of water from each water right. Because developing detailed construction drawings and specifications will be expensive, prospective municipal wells will not be designed before receiving permission to transfer water from the Ranch.

Nevertheless, prospective well locations have been selected based on available information. Additional design work will be needed to narrow these preliminary placements to the ultimate well locations.[59]

---

[54] Precision might be required if there was a question about whether the Transfer Act applied.

[55] K.S.A. 82a-1502(c)(6).

[56] K.A.R. 5-50-2(g).

[57] K.A.R. 5-50-2(c).

[58] K.A.R. 5-50-7.

The maps attached as Exhibits D and E show the proposed well locations based on the information available at this time, the proposed moves of each of the irrigation wells, and those portions of the Ranch that are within one-half mile of existing wells owned by others. The Cities will not place any new wells within one-half mile of wells owned by others.

The Cities request that the orders approving changes in points of diversion allow new wells to be drilled within a 1,000 foot radius of the proposed points of diversion but not closer than one-half mile from permitted wells owned by the Cities' neighbors.

In the alternative, the Cities request that the orders granting the change applications without specific well locations and instead set out provisions establishing well-location methodologies and parameters as provided in the Burns and McDonnell memorandum attached as Exhibit F. Stated another way, an alternative to designating specific points of diversion before the transfer proceeding is complete is to establish a process and criteria that will be used to establish well locations in the future.

These alternative approaches provide DWR, the Executive Director of the Kansas Water Office, the Secretary of Health and Environment, and neighboring landowners with information about prospective well locations while delaying the expense required to locate wells with precision and the uncertainty of waiting to establish new well locations until after the transfer is approved.

In the alternative, the Cities request a prospective waiver of the requirement that they obtain contingently approved orders identifying the number, locations, rates, and quantities of the specific authorized points of diversion before their transfer application will be deemed complete.[60]

E. Paragraphs 8, 9, and 10. Presently authorized points of diversion

Paragraph 8 of DWR's change application form, and where applicable paragraphs 9 and 10, requests the "Authorized Quantity" for each water right. The Cities interpret this as a request for quantity that may lawfully be used for irrigation before any changes are made.

However, DWR's regulation states that the actual perfected quantities are used to determine the extent of "consumptive use from the local source of water supply . . . by the original irrigation use"[61] during "any one calendar year during the perfection period."[62]

As discussed in the attachments to the change applications, many of the water rights had permitted and perfected quantities in excess of 1.5 acre-feet per acre. The certificates nevertheless reduced quantities to 1.5 acre-feet per acre without providing the then-owners with

---

[59] We find no regulation that requires that wells drilled pursuant to a change application be placed within 300 feet of the approved location. K.A.R. 5-5-6(a) only applies to new applications to appropriate water. That said, the Cities assume that DWR imposes a 300-foot limitation in orders approving change applications by using the phrase defined in K.A.R. 5-1-1(q) but not otherwise used in the regulations.

[60] *See* K.A.R. 5-50-2(x)(2)(C) and K.A.R. 5-50-7(b)(1).

[61] K.A.R. 5-5-9(a).

[62] K.A.R. 5-5-9(a)(1).

notice or an opportunity for a hearing regarding the reduction of the quantities of their water rights.

For example, the permit for File No. 22,339 was issued on March 19, 1976, granting the right to divert up to 198 acre-feet annually at a rate not to exceed 1,000 gallons per minute for irrigation use[63] on 110 acres in Section 10-T26S-R20W.[64] DWR's Field Inspection Report indicates that 218 acre-feet were applied to 110 approved acres so that all of the 198 acre-feet authorized by the permit were lawfully perfected.[65] But the subsequently issued certificate impermissibly limited the quantity to 165 acre-feet based on DWR's after-the-fact determination that 1.5 acre-feet per acre was a reasonable quantity for irrigation use.[66]

The actual perfected quantities are used to determine consumptive use.

F. Paragraph 11. Describe the current condition of and future plans for any point(s) of diversion that will no longer be used

Currently authorized well locations are shown on the maps attached to each application and on Exhibits D and E. .

The Cities are engaged in a phased well-plugging program beginning with the wells on the south end of the Ranch, moving north. The Cities expect that all of the irrigation wells on the Ranch, including wells associated with water rights that will not be physically converted to municipal use during the first phase, will be plugged by the time the transfer is approved. The current status of each of the wells on the Ranch is shown on Exhibits G and H.

3. Proposed rate

The proposed rate for each new point of diversion is the sum of the certified rates from each of the existing points of diversion that are being consolidated into a single new point of diversion, taking into account any overall limitations to those rates. The Cities do not expect new municipal wells to produce at a rate equal to the sum of the rates of all of the wells being consolidated but cannot establish reasonable rates until the new wells are designed. Actual rates of diversion will be based on aquifer characteristics and on well and system design parameters.

G. Paragraph 13. Describe how consumptive use will not be increased

The consumptive-use analysis for each water right is attached to each of the change applications.

DWR's regulation limits the quantity that can be changed to a new type of use to the "maximum annual quantity authorized by the water right."[67] The term "maximum annual quantity authorized by the water right" is not defined; however, subsection (b) of the same

---

[63] File No. 23,339 Permit, HAYS003317.

[64] File No. 23,339 Application, HAYS003310.

[65] File No. 23,339 FIR, HAYS003302.

[66] *Clawson v. Kansas Dept. of Agriculture, Div. of Water Resources*, 49 Kan. App. 2d 789, 315 P.3d 896 (2013).

[67] K.A.R. 5-5-9(a)(4).

regulation specifically provides that consumptive use can be based on the historic net consumptive use "actually made during the perfection period."[68]

As discussed in Section V.E., above, some of the R9 permits "authorized" in excess of 1.5 acre-feet per acre and in most of those instances, the then-owners perfected the full permitted quantity. But when certificates were issued, DWR reduced the permitted quantities to 1.5 acre-feet per acre even though greater quantities were lawfully perfected and even though there was no substantive or procedural justification for those reductions.

The quantities requested by the Cities are based on the net consumptive use actually and lawfully made during any one year during the perfection period, limited by the quantity authorized in the permits, not the improper quantity limitation imposed in some of the certificates.

In our July 2014 meeting, Brent Turney stated that if alfalfa was grown during the perfection period, the Net Irrigation Requirement ("NIR") for alfalfa, rather than the NIR for corn, would be used to determine consumptive use.[69]

Information in the DWR files and in other locations shows that alfalfa was grown on a number of circles during the perfection period.[70] The relevant documents are attached to the applications. The Cities have provided information on consumptive use for the locations where alfalfa is known to have been grown. The Cities believe that alfalfa was grown on most, if not all of the circles but have not yet found evidence to support that belief for some circles on the Ranch. The Cities reserve the right to provide DWR with additional information on crops grown during the perfection period.

H. Paragraph 17. Attach documentation to show the proposed changes will not impair existing water rights and relate to the same local source of supply

The attached map shows the location of proposed municipal wells, the presently authorized points of diversion, and neighboring wells. The Cities own all of the irrigation and domestic wells within one-half mile of all of the proposed points of diversion.

Exhibit I shows the location of all permitted wells in the proximity of the R9 Ranch. There are no permitted wells within one-half mile of any of the proposed points of diversion. The Cities will not move their wells to locations within one-half mile of any permitted well. *See* the shaded areas on Exhibits D and E.

Exhibit J shows the locations of all non-permitted wells within one-half mile of the proposed locations. Because the Cities have requested the ability to move up to 1,000 feet, Exhibit K shows the neighboring wells that are within 3,640 feet of the proposed well locations.

---

[68] *See, e.g.*, K.A.R. 5-5-9(b).

[69] K.A.R. 5-5-12 provides the NIR for corn.

[70] The R-9 Ranch has had several names over the years including "Lucerne Farms." Alfalfa, also called lucerne, is a perennial forage legume in the pea family *Fabaceae* that normally lives four to eight years but can live more than 20 years, depending on variety and climate.

The names and addresses of the owners of wells shown on Exhibits J and K are attached as Exhibit L.

I. Paragraph 18. Identify the rules and regulations for which you request a waiver

When well locations are consolidated, some new wells will be closer to the Arkansas River while others will be farther away. If, for example, the five wells associated with File 21,731 are consolidated as shown in Exhibit D and E, two of the wells will move closer to the River and two will move away from the River. To the extent it is applicable, a waiver of K.A.R. 5-5-13 may be required.

We find no regulation that requires that wells drilled pursuant to a change application be placed within 300 feet of the approved location. K.A.R. 5-5-6(a) only applies to new applications to appropriate water. That said, the Cities assume that DWR imposes a 300-foot limitation in orders approving change applications by using the phrase "completed substantially as shown on aerial photograph, topographic map, or plat," defined but not used in DWR's regulations.[71] While a waiver of a regulation is not required, as discussed in Section V.D., *supra*, the Cities request orders that provide greater flexibility regarding ultimate well placement.

In Section V.D. the Cities have requested, in the alternative, a prospective waiver of the requirement that they obtain contingently approved orders identifying the number, locations, rates, and quantities of the specific authorized points of diversion before their transfer application will be deemed complete.[72]

---

[71] K.A.R. 5-1-1(q).

[72] *See* K.A.R. 5-50-2(x)(2)(C) and K.A.R. 5-50-7(b)(1).

VI. Conclusion

The following table sets out the quantity requested for each water right.

Table 12

File No.	Circle[73]	Quantity Requested in Acre-Feet	Rate in Gallons Per Minute	Proposed Municipal Well		File No.	Circle	Quantity Requested in Acre-Feet	Rate in Gallons Per Minute	Proposed Municipal Well
21,729	7, 8, 9, 10	870.8	2900.0	A		22,333	39	57.5	520.0	K
21,730	1	203.8	795.0	G		22,334	27	162.9	890.0	K
21,731	2	222.9	1075.0	G		22,335	26	171.4	1000.0	K
21,731	3, 4, 5	768.1	2490.0	H		22,338	28	141.1	950.0	L
21,732	6, 11, 12	688.0	2380.0	B		22,339	27	142.6	680.0	L
21,733	13	219.5	915.0	C		22,340	31	140.4	950.0	M
21,734	16	226.4	861.0	E		22,341	30	190.4	920.0	M
21,734	18	148.0	777.8	C		22,342	36	100.8	630.0	M
21,734	14, 15, 17	522.5	3161.2	D		22,343	35	146.2	810.0	N
21,841	8A	195.0	890.0	F		22,345	38	184.6	820.0	N
21,842	11A	195.0	900.0	E		22,346	37	146.1	600.0	N
22,325	19	216.0	1000.0	I		27,760	32	142.6	800.0	L
22,326	20	196.7	1000.0	I		27,760	33	141.5	970.0	K
22,327	21	175.1	950.0	I		29,816	10A	97.5	800.0	E
22,329	24	150.5	570.0	J		29,816	9A	90.0	750.0	F
22,330	25	152.6	620.0	J		30,083	36	43.9	1000.0	M
22,331	22	209.0	1000.0	J		30,084	24	0.0	0.0	J
22,332	23	166.3	980.0	J		**Total Quantity**		**7625.50**		

The following table summarizes the quantity and rate requested for each proposed municipal well.

Table 13

Proposed Municipal Well	Quantity Requested in Acre-Feet	Rate in Gallons Per Minute		Proposed Municipal Well	Quantity Requested in Acre-Feet	Rate in Gallons Per Minute
A	870.8	2900.0		H	768.1	2490.0
B	688.0	2380.0		I	587.8	2950.0
C	367.5	1692.8		J	678.4	3170.0
D	522.5	3161.2		K	533.2	3380.0
E	518.9	2561.0		L	426.2	2430.0
F	285.0	1640.0		M	475.5	3500.0
G	426.7	1870.0		N	476.9	2230.0
				Total	**7625.5**	

[73] See Exhibit M, a map showing the circle numbers and water right file numbers on the R9 Ranch.

The Cities of Hays and Russell respectfully ask DWR to contingently approve the change applications on the terms and conditions requested in the applications and this letter.

Very truly yours,

FOULSTON SIEFKIN LLP

David M. Traster

C: John T. Bird, Hays City Attorney
Ken Cole, Russell City Attorney
Toby Dougherty, City of Hays
Orrin Feril, GMD5 Manager
Bernie Kitten, Hays Director of Utilities
Jeff Lanterman, DWR Stafford Field Office Water Commissioner
Robert Large, Dept. of Agriculture Attorney
Brian Meier, Burns and McDonnell
John Mitchell, KDHE
Lynn Preheim, GMD5 Attorney
Jon Quinday, City of Russell
Tracy Streeter, Kansas Water Office
Arlyn Unrein, Russell Director of Public Works

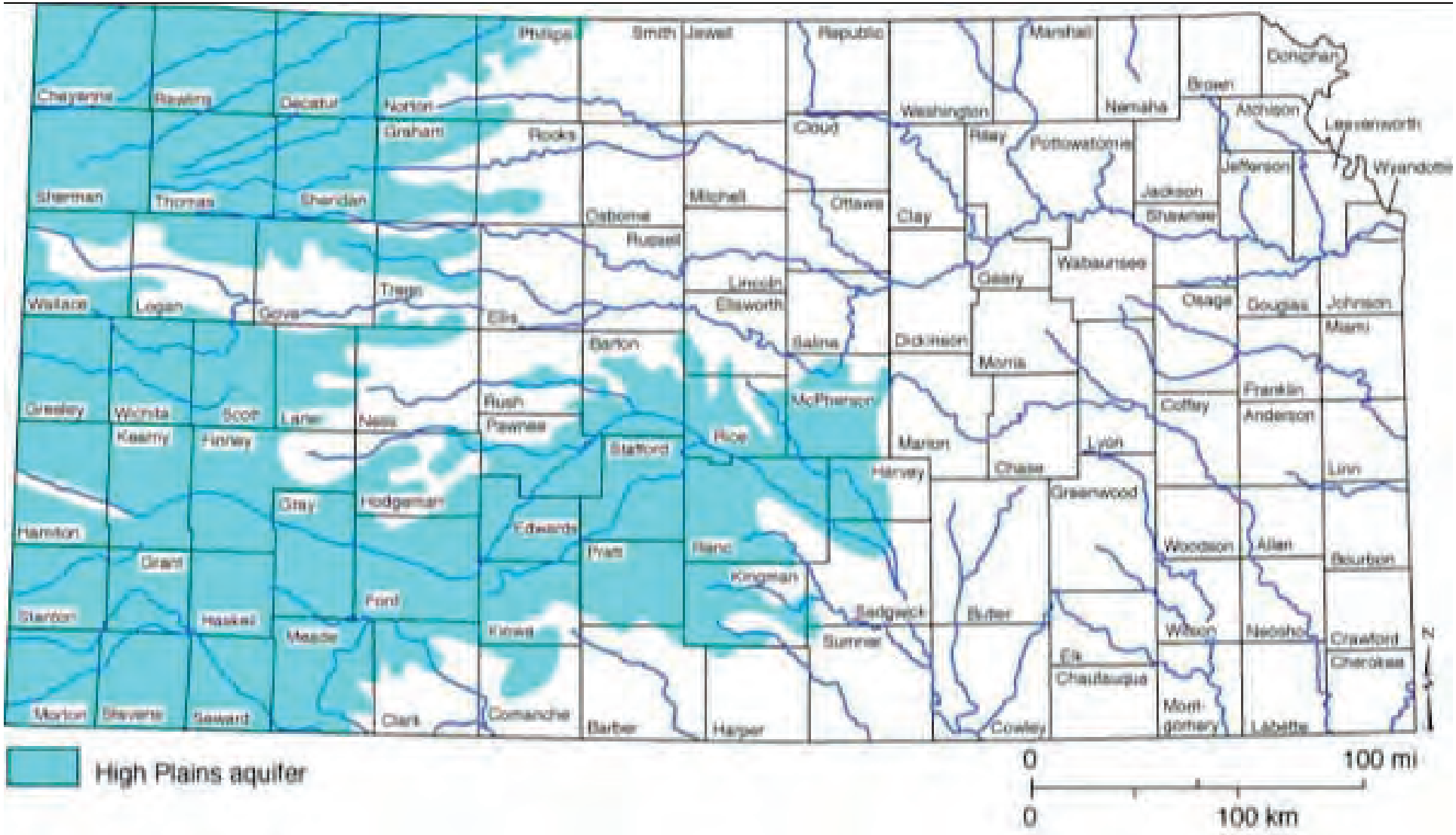

Phillips
Smith
Jewell
Republic
Marshall
Doniphan
Brown
Nemaha
Atchison
Leavenworth
Wyandotte
Washington
Riley
Pottawatomie
Jefferson
Jackson
Shawnee
Cheyenne
Rawlins
Decatur
Norton
Graham
Rooks
Cloud
Sherman
Thomas
Sheridan
Mitchell
Ottawa
Clay
Osborne
Russell
Wabaunsee
Geary
Wallace
Logan
Gove
Trego
Lincoln
Ellsworth
Ellis
Osage
Douglas
Johnson
Miami
Barton
Saline
Dickinson
Morris
Greeley
Wichita
Scott
Lane
Ness
Rush
Pawnee
McPherson
Coffey
Franklin
Anderson
Kearny
Finney
Rice
Stafford
Marion
Lyon
Chase
Linn
Harvey
Greenwood
Gray
Hodgeman
Hamilton
Edwards
Pratt
Reno
Woodson
Allen
Bourbon
Grant
Kingman
Ford
Stanton
Haskell
Meade
Kiowa
Sedgwick
Butler
Wilson
Neosho
Crawford
Sumner
Cherokee
Elk
Chautauqua
Morton
Stevens
Seaward
Clark
Comanche
Barber
Harper
Cowley
Montgomery
Labette
N
High Plains aquifer
0
100 mi
0
100 km

EXHIBIT
A

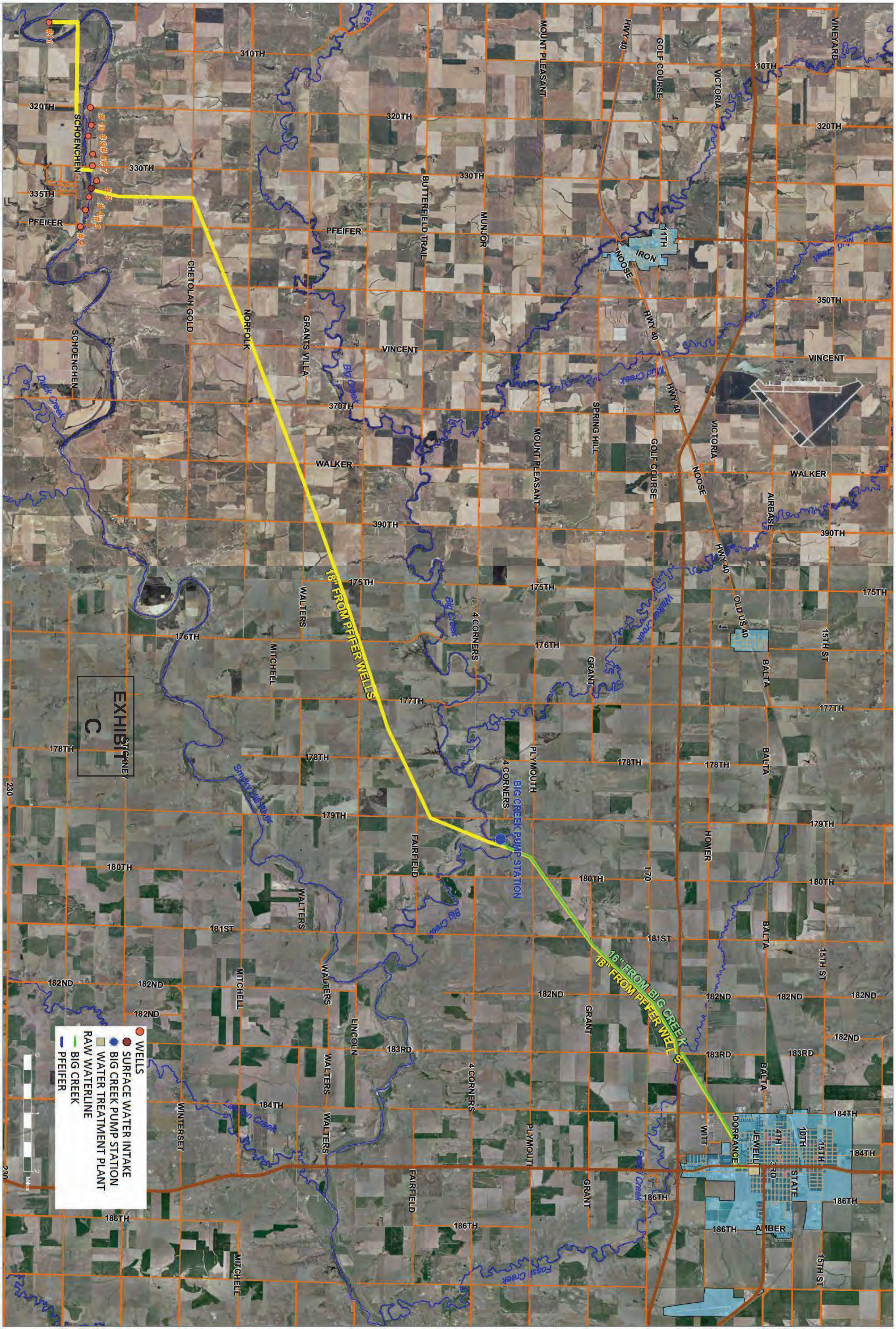
Exhibit B

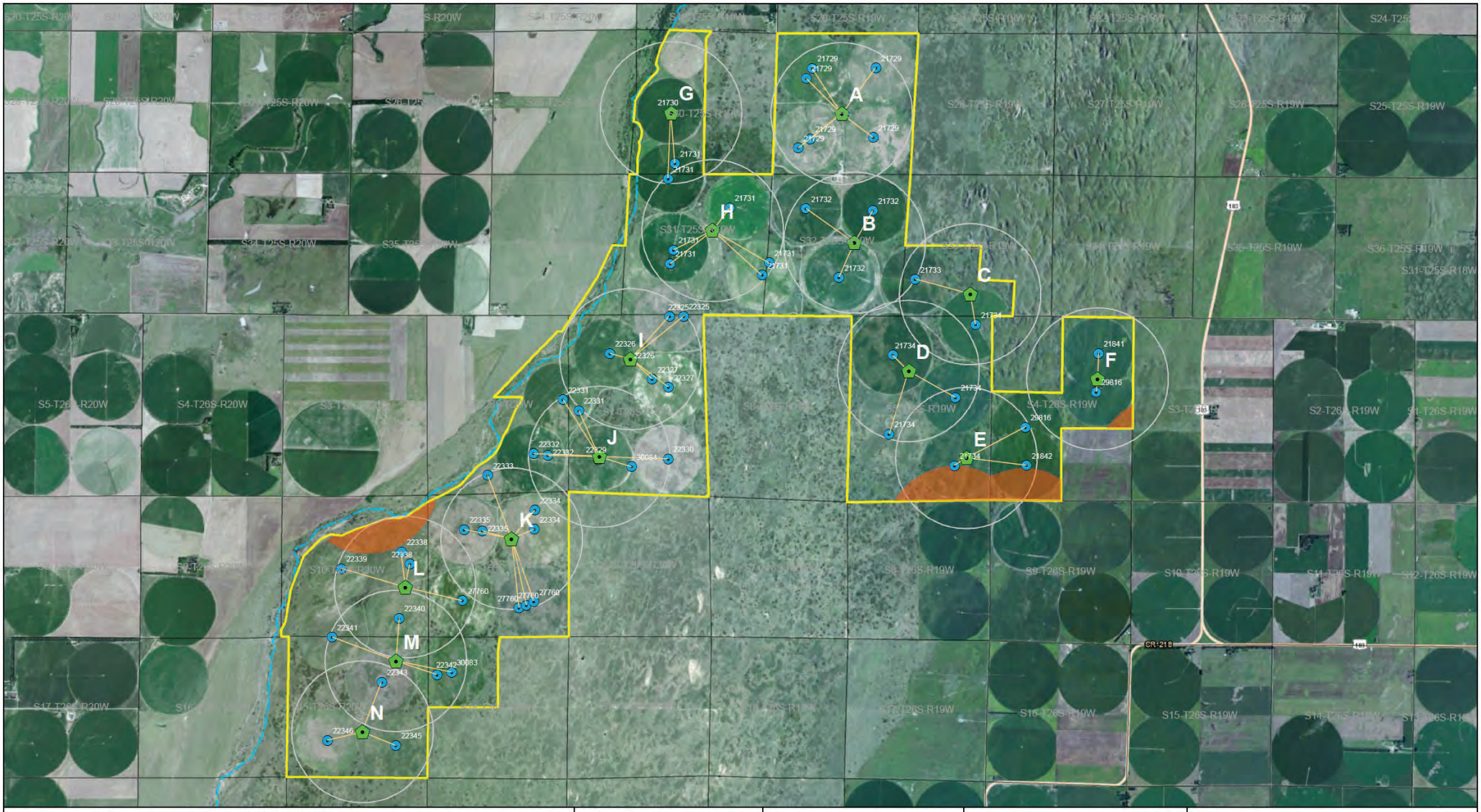
DWR File No. (All quantities are in acre-feet per year)	Well number	Gross quantity	Limitations on quantities in DWR Permits and Orders	Limitations on quantities in DWR Permits and Orders	Net quantities after DWR ordered limitations	Limitations imposed by the Smoky Hill River IGUCA	Net quantities after IGUCA and DWR ordered limitations	Net quantities after all limitations
Big Creek Wells								
40,367	C-33	314.00	314.00	1,227.55	1,227.55		1,429.46	3,675
40,368	C-32	314.00						
EL 002	C-29	1,227.55	102.99					
EL 002	C-30	1,227.55	102.99					
EL 002	C-20	1,227.55	0.00					
EL 002	C-17	1,227.55	1,021.57					
EL 002	C-21	1,227.55						
EL 002	C-24	1,227.55						
EL 002	C-27	1,227.55						
EL 002	C-28A	1,227.55						
EL 002	C-31	1,227.55						
EL 002	C-19	1,227.55						
18,857		10.74	10.74					
18,858		10.74	10.74					
36,519		34.42	34.42					
36,520		9.20	9.20					
36,804		3.81	3.81					
Yuasa Wells*								
33,548	YE-1	61.00	61.00					
33,548	YE-2	72.00	72.00					
Smoky Hill Wells								
1,248 / 5,757	S-8	2,500.00		2,500.00	2,500.00	2,085.58	2,285.83	
1,248 / 5,757	S-10	2,500.00						
1,248 / 5,757	S-11	2,500.00						
1,248 / 5,757	S-13	2,500.00						
1,248 / 5,757	S-14	2,500.00						
1,248 / 5,757	S-16	2,500.00						
1,248 / 5,757	S-18	2,500.00						
1,248 / 5,757	S-21	2,500.00						
1,248 / 5,757	S-19	2,500.00	968.00					
1,248 / 5,757	S-20	2,500.00						
33,296	S-22	155.20		300.00	300.00	200.25		
33,296	S-23	176.96						
Dakota Wells*								
40,702	D-6	121.00	121.00				882.00	
40,703	D-3	160.00	160.00					
40,704	D-5	160.00	160.00					
40,705	D-4	160.00	160.00					
40,706	D-1	121.00	121.00					
40,707	D-2	160.00	160.00					

* The Yuasa and Dakota wells are limited to a total annual capacity of 3,675 af/y when combined with other water rights.

EXHIBIT B

CITY OF RUSSELL WATER SOURCE





Legend

- Proposed Municipal Wells (A-N)
- Existing R9 Ranch Points of Diversion
- 1/2 Mile Buffer Around Proposed Wells
- Water Rights Consolidation Lines
- Area Excluded From Proposed Wells
- River Centerline
- R9 Ranch Property Boundary
- PLSS Sections

1:40,000

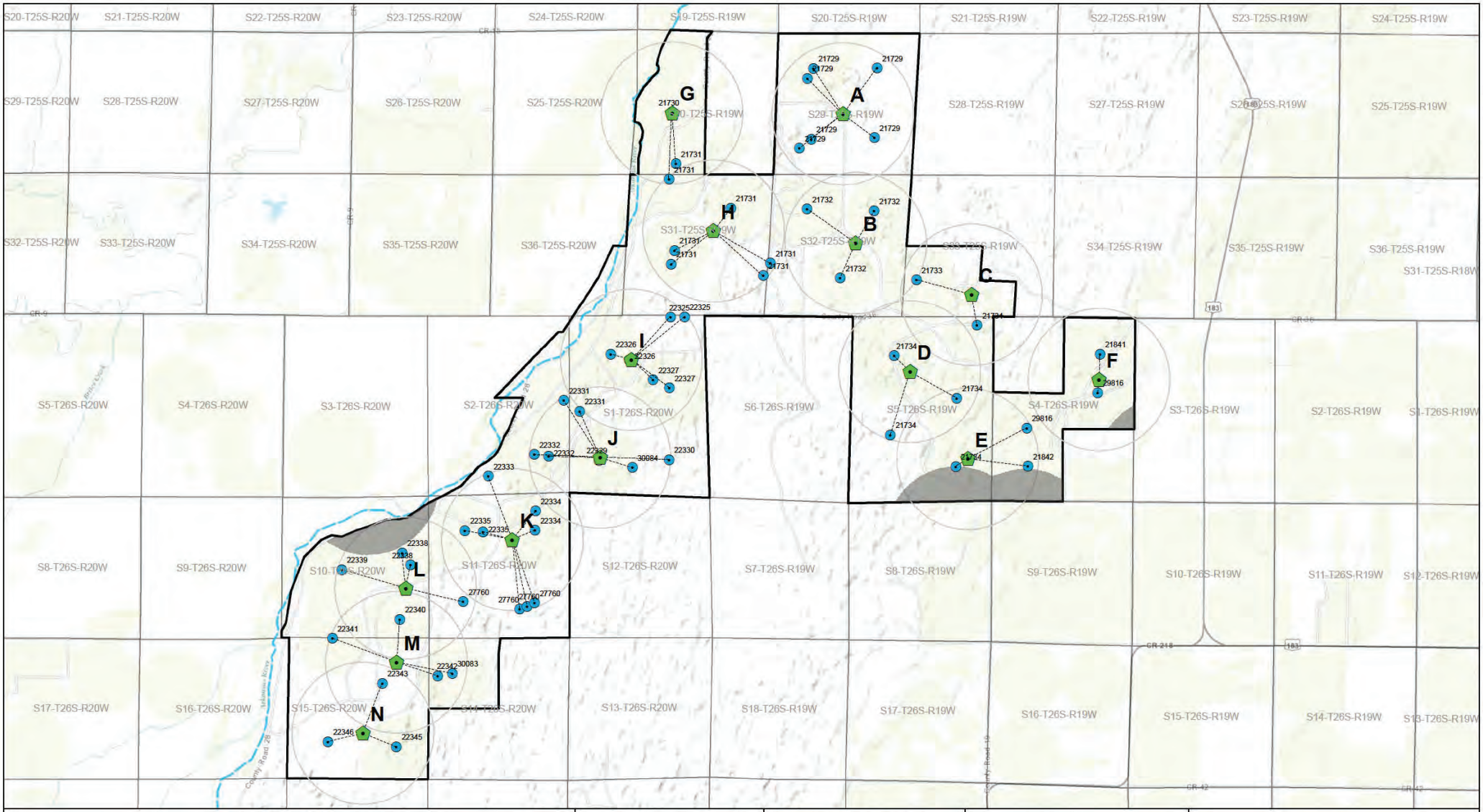
N

0 0.25 0.5 1 Miles

HAYS KANSAS

BURNS McDONNELL

EXHIBIT D



Legend

- Proposed Municipal Wells (A-N)
- Existing R9 Ranch Points of Diversion
- 1/2 Mile Buffer Around Proposed Wells
- Water Rights Consolidation Lines
- Area Excluded From Proposed Wells
- River Centerline
- R9 Ranch Property Boundary
- PLSS Sections

1:40,000

N

0 0.25 0.5 1 Miles

HAYS KANSAS

BURNS McDONNELL

EXHIBIT E

Memorandum

BURNS McDONNELL

Date: June 16, 2015

To: Kansas Department of Agriculture – Division of Water Resources

From: Paul McCormick
Daniel Clement

Subject: R9 Ranch Conversion to Municipal Water Supply
Methodologies for Well Site Selection and Design

In 1994 the cities of Hays and Russell purchased roughly 6,700 acres of farmland south of Kinsley in Edwards County, Kansas, now known as the R9 Ranch. The cities of Hays and Russell purchased the Ranch intending to convert existing irrigation water rights to municipal water supply. This memo describes the process and methodology the Cities will use to refine the proposed well locations set out in the change applications.

The approach and methods discussed below were specifically developed to address the unique geographical and physical necessities of each proposed well location, to satisfy regulatory standards, and to prevent impairment of other water rights.

I. Regulatory Considerations

First consideration will be given to the regulatory constraints imposed on changes in points of diversion, such as:

- The new municipal points of diversion will remain in the same source of supply and are proposed at no more than one-half mile from the originally authorized irrigation well locations.
- As discussed below, the proposed rates of the new municipal wells will not exceed the combined rate of the original irrigation wells and are likely be much lower.
- The quantities for each new municipal well will not exceed the combined quantity authorized by associated change applications.
- The location of the proposed municipal wells will either maintain or increase well spacing between third-party irrigation wells, in addition consideration will be given to anticipated changes in pumping patterns.
- Well spacing between the new municipal wells will be specifically designed to minimize interference and aquifer stress.

II. Aquifer Properties

Using existing data, the Cities anticipate further refining the new municipal well locations by locating the highest yielding portions of the aquifer with acceptable water quality. For example, groundwater modeling, well logs, bedrock elevations, water level measurements, and water

EXHIBIT
F

quality analyses will be utilized to focus development on areas with the maximum saturated thickness and the highest aquifer hydraulic conductivity.

Locating wells in portions of the aquifer with lower levels of impurities will prolong pumping and transmission equipment, reduce equipment and pipeline maintenance, and lower treatment costs. In general, the water throughout the Ranch is fresh and usable with some areas containing elevated nitrates and sulfates. Lab results from several rounds of water quality testing from both irrigation and monitoring wells will identify areas with lower nitrate, sulfate, iron, and manganese levels.

III. Physical Limitations and Infrastructure Considerations

Well locations will be further refined by identifying physical and infrastructure limitations such as topography, erosion potential, accessibility, and proximity to the collection pipeline.

- *Topography* – Well sites will be located in areas of stable ground and avoid both topographic highs and lows, which are susceptible to erosion or burial. The Ranch is located in an area of sandy soils that are highly susceptible to wind erosion and quickly create undulating sand-dune topography. Adequate vegetative cover is needed to stabilize the soil. Infrastructure design will consider the geomorphology of each proposed well site and surrounding land management practices to mitigate erosion.
- *Well Site Access* – Access roads will be maintained during seasonal extremes and avoid existing sand dune topography.
- *Power Access* – Potential well sites will be within a reasonable proximity to power distribution lines.
- *Proximity to the Collection Pipeline* – Well sites need to be within a reasonable proximity to a raw water collection system.

IV. Aquifer Testing Program

Areas identified as viable after consideration of regulatory, aquifer capacity, and infrastructure limitations will be further evaluated using physical and geophysical methods that may include:

- Test holes, collection of geologic samples, and creation of lithological logs;
- GeoProbe direct push sampling;
- Geophysical logging;
- Test well construction;
- Monitoring well installation;
- Water quality sampling; and
- Aquifer pump testing.

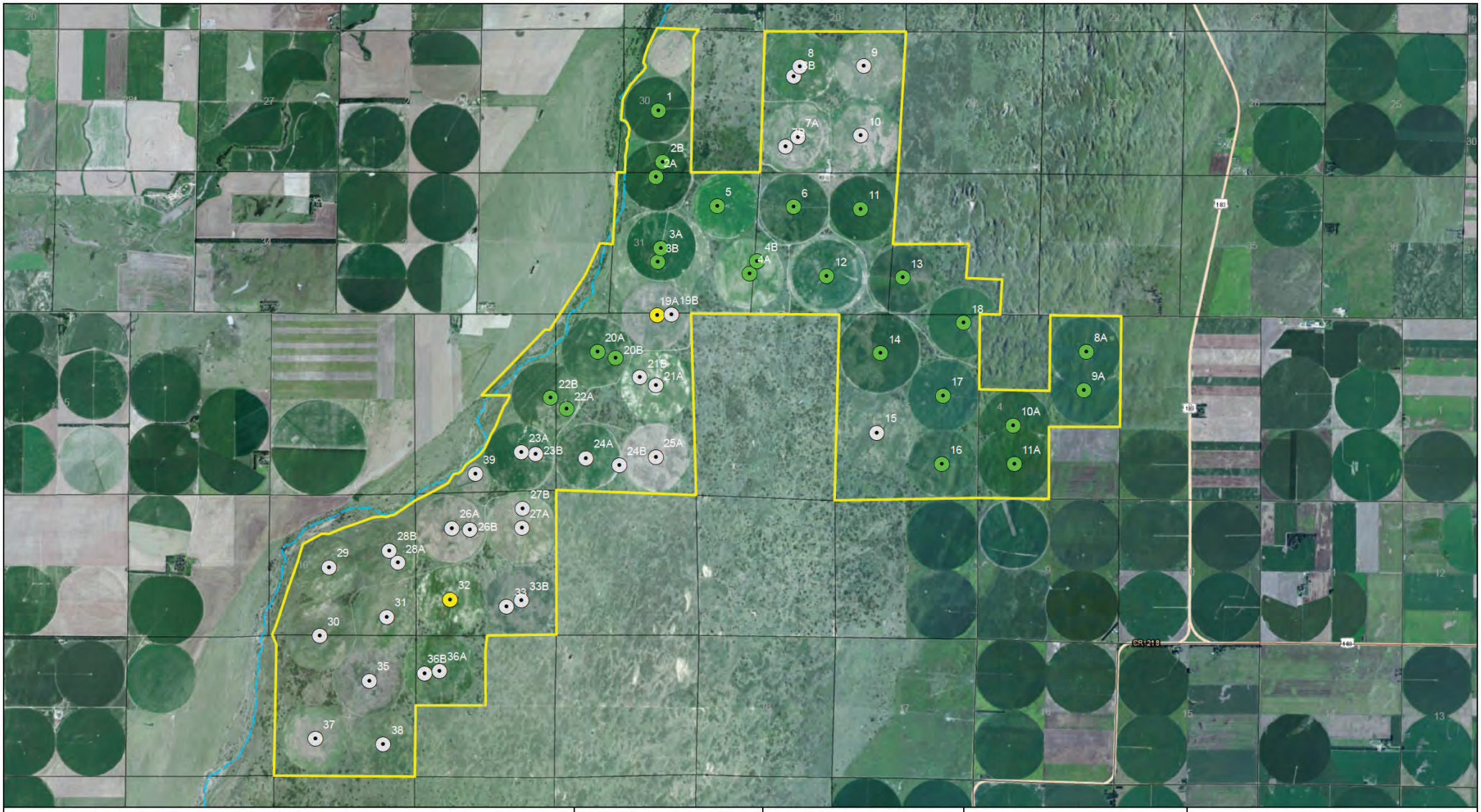
V. Final Well Design

Final well placement and design will utilize the information described above. Final well design will include the following:

- Design production rate;
- Surface completion infrastructure and site footprint;
- Borehole diameter and depth;
- Surface casing diameter and length;
- Screen diameter, length, and placement;
- Screen material and slot sizing;
- Gravel pack specifications; and
- Grouting intervals

The phasing and selection of final well locations will be closely coordinated with DWR staff in conjunction with the completion of change applications.

PAM/DWC



Legend

R9 Ranch Irr. Well Status

- Active
- Inactive
- Plugged

- R9 Ranch Property Boundary
- River Centerline

1:40,000

N

0 0.25 0.5 1 Miles

HAYS KANSAS

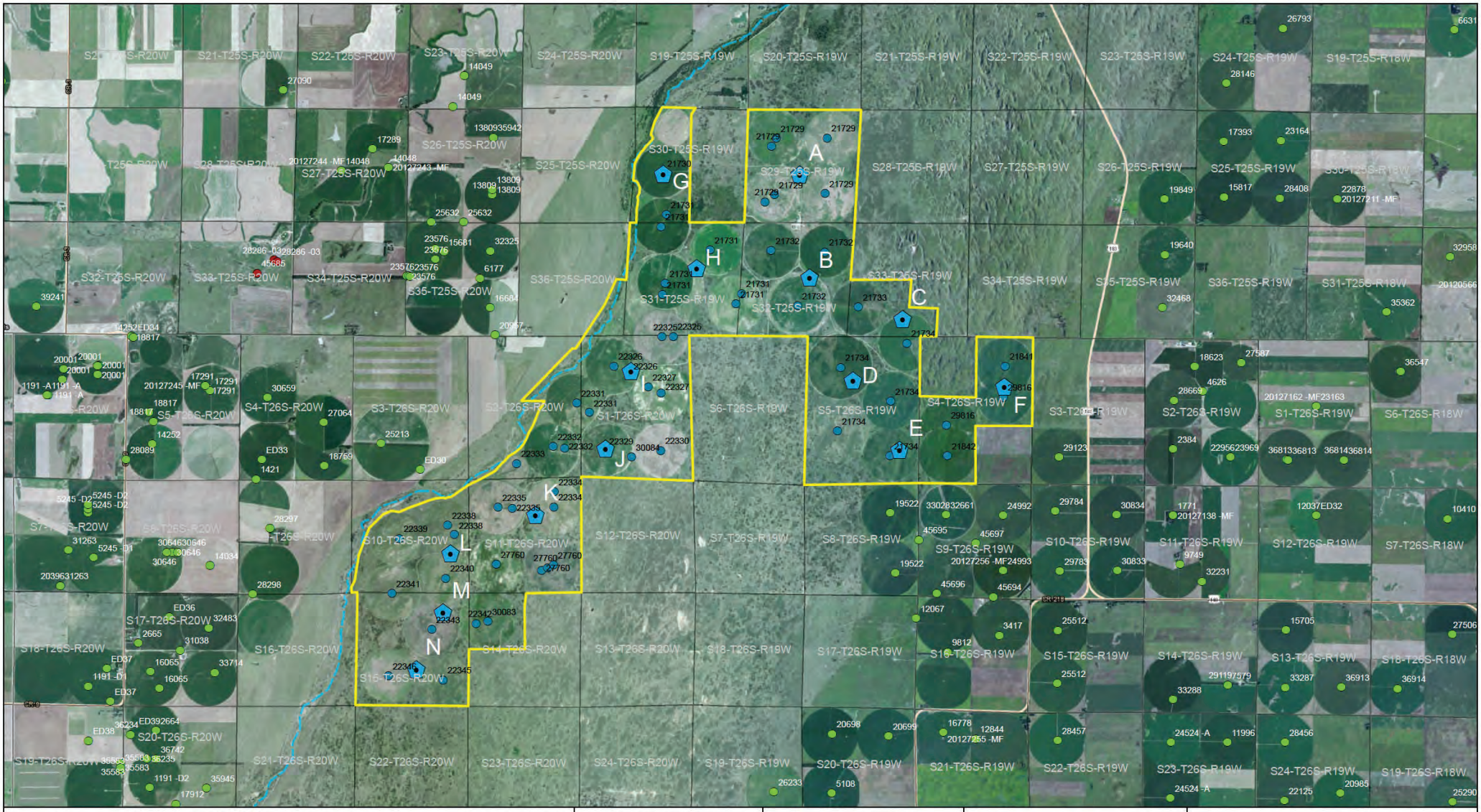
BURNS McDONNELL

EXHIBIT G

Site Name	Well Status	Water Right	Longitude	Latitude	Township	Range	Section	Feet North	Feet West	Qual 3	Qual 2	Qual 1
1	Active	21730	-99.45506	37.84661	25S	19W	30	2330	3937	NW	NE	SW
5	Active	21731	-99.44736	37.836813	25S	19W	31	3975	1270		NC	NE
2A	Active	21731	-99.45535	37.83976	25S	19W	31	5125	3920	NW	NE	NW
2B	Active	21731	-99.45447	37.84132	25S	19W	30	380	3785	SW	SE	SW
3A	Active	21731	-99.45461	37.83246	25S	19W	31	2460	3660	NW	NE	SW
3B	Active	21731	-99.45503	37.83104	25S	19W	31	1925	3810	CW	NE	SW
4A	Active	21731	-99.44313	37.82993	25S	19W	31	1448	187	SE	NE	SE
4B	Active	21731	-99.44223	37.83121	25S	19W	32	1931	4960	SW	NW	SW
6	Active	21732	-99.43752	37.83678	25S	19W	32	4026	3966		NC	NW
11	Active	21732	-99.42885	37.8366	25S	19W	32	4019	1358		NC	NE
12	Active	21732	-99.43319	37.82971	25S	19W	32	1441	2632		NC	S2
13	Active	21733	-99.423352	37.829567	25S	19W	33	1356	5021	SW	NW	SW
14	Active	21734	-99.426174	37.821805	26S	19W	5	5394	3640			
16	Active	21734	-99.418161	37.810491	26S	19W	5	1274	1325	NE	SW	SE
17	Active	21734	-99.41807	37.81747	26S	19W	5	3776	1306			
18	Active	21734	-99.41549	37.82495	26S	19W	5	6538	525			
8A	Active	21841	-99.3996	37.82206	26S	19W	4	5378	1340	NE	NW	NE
11A	Active	21842	-99.408866	37.810535	26S	19W	4	1301	3910		NC	SW
20A	Active	22326	-99.462799	37.821811	26S	20W	1	5373	3779			
20B	Active	22326	-99.460376	37.82121	26S	20W	1	5128	3066			
22A	Active	22331	-99.46676	37.815936	26S	20W	1	3240	4875	NC	SW	NW
22B	Active	22331	-99.468785	37.817062	26S	20W	2	3460	235			
10A	Active	29816	-99.409033	37.814461	26S	19W	4	2731	3960		CS	NW
9A	Active	29816	-99.399893	37.818095	26S	19W	4	4056	1320	CN	S2	NE
19A	Inactive	22325	-99.455084	37.825625	26S	20W	1	6673	1535	NE	NW	NE
32	Inactive	27760	-99.481654	37.796366	26S	20W	11	1298	4002	NE	SW	SW
8	Plugged	21729	-99.4368	37.85115	25S	19W	29	3982	3603		NC	NW
9	Plugged	21729	-99.428547	37.851219	25S	19W	29	3968	1312		NC	NE
10	Plugged	21729	-99.428857	37.8441	25S	19W	29	1377	1415		NC	SE
7A	Plugged	21729	-99.43703	37.84393	25S	19W	29	1416	4000		NC	SW
7B	Plugged	21729	-99.43854	37.84299	25S	19W	29	1043	4370	NE	SW	SW
8B	Plugged	21729	-99.43755	37.85015	25S	19W	29	3607	4167	NE	SW	NW
15	Plugged	21734	-99.42663	37.81366	26S	19W	5	2348	3773	NW	NE	SW
19B	Plugged	22325	-99.453255	37.82568	26S	20W	1	6669	996	NW	NE	NE
21A	Plugged	22327	-99.455179	37.818406	26S	20W	1	4062	1539		NC	NE
21B	Plugged	22327	-99.457286	37.819214	26S	20W	1	4372	2154			
24A	Plugged	22329	-99.464197	37.810926	26S	20W	1	1380	4090		NC	SW
25A	Plugged	22330	-99.455179	37.811038	26S	20W	1	1397	1515		NC	SE
23A	Plugged	22332	-99.472559	37.811492	26S	20W	2	1407	1330		NC	SE
23B	Plugged	22332	-99.47072	37.811307	26S	20W	2	1342	797	NC	E2	SE
39	Plugged	22333	-99.478486	37.80927	26S	20W	2	590	3053	SE	SE	SW
27A	Plugged	22334	-99.472428	37.803728	26S	20W	11	3960	1335		NC	NE
27B	Plugged	22334	-99.472378	37.805716	26S	20W	11	4680	1320	NC	N2	N2
26A	Plugged	22335	-99.481468	37.803649	26S	20W	11	3970	3945		NC	NW
26B	Plugged	22335	-99.47913	37.80354	26S	20W	11	3920	3270	NC	E2	NW
28A	Plugged	22338	-99.488459	37.800114	26S	20W	10	2705	730			

EXHIBIT H

Site Name	Well Status	Water Right	Longitude	Latitude	Township	Range	Section	Feet North	Feet West	Qual 3	Qual 2	Qual 1
28B	Plugged	22338	-99.489555	37.801341	26S	20W	10	3152	1043			
29	Plugged	22339	-99.497344	37.799599	26S	20W	10	2535	3300			
31	Plugged	22340	-99.489807	37.794551	26S	20W	10	690	1136	NW	SE	SE
30	Plugged	22341	-99.498505	37.792555	26S	20W	15	5240	3600	NW	NE	NW
36B	Plugged	22342	-99.48489	37.78877	26S	20W	14	3906	4878	NW	SW	NW
35	Plugged	22343	-99.491831	37.78796	26S	20W	15	3565	1670	NE	SW	NE
38	Plugged	22345	-99.490224	37.781395	26S	20W	15	1175	1205		NC	SE
37	Plugged	22346	-99.498997	37.781998	26S	20W	15	1395	3740	SW	NE	SW
33	Plugged	27760	-99.474345	37.795657	26S	20W	11	1040	1890	NE	SW	SE
33B	Plugged	27760	-99.472441	37.796316	26S	20W	11	1280	1340	NE	SW	SE
36A	Plugged	30083	-99.483	37.78904	26S	20W	14	3994	4328	E2	W2	NW
24B	Plugged	30084	-99.459906	37.810203	26S	20W	1	1105	2860		NC	S2



Legend

- Proposed Municipal Wells
- R9 Ranch Property Boundary
- PLSS Sections
- River Centerline
- Existing R9 Ranch Irrigation Wells
- Irrigation Wells (File No.)
- Stockwater Wells (File No.)

1:50,000

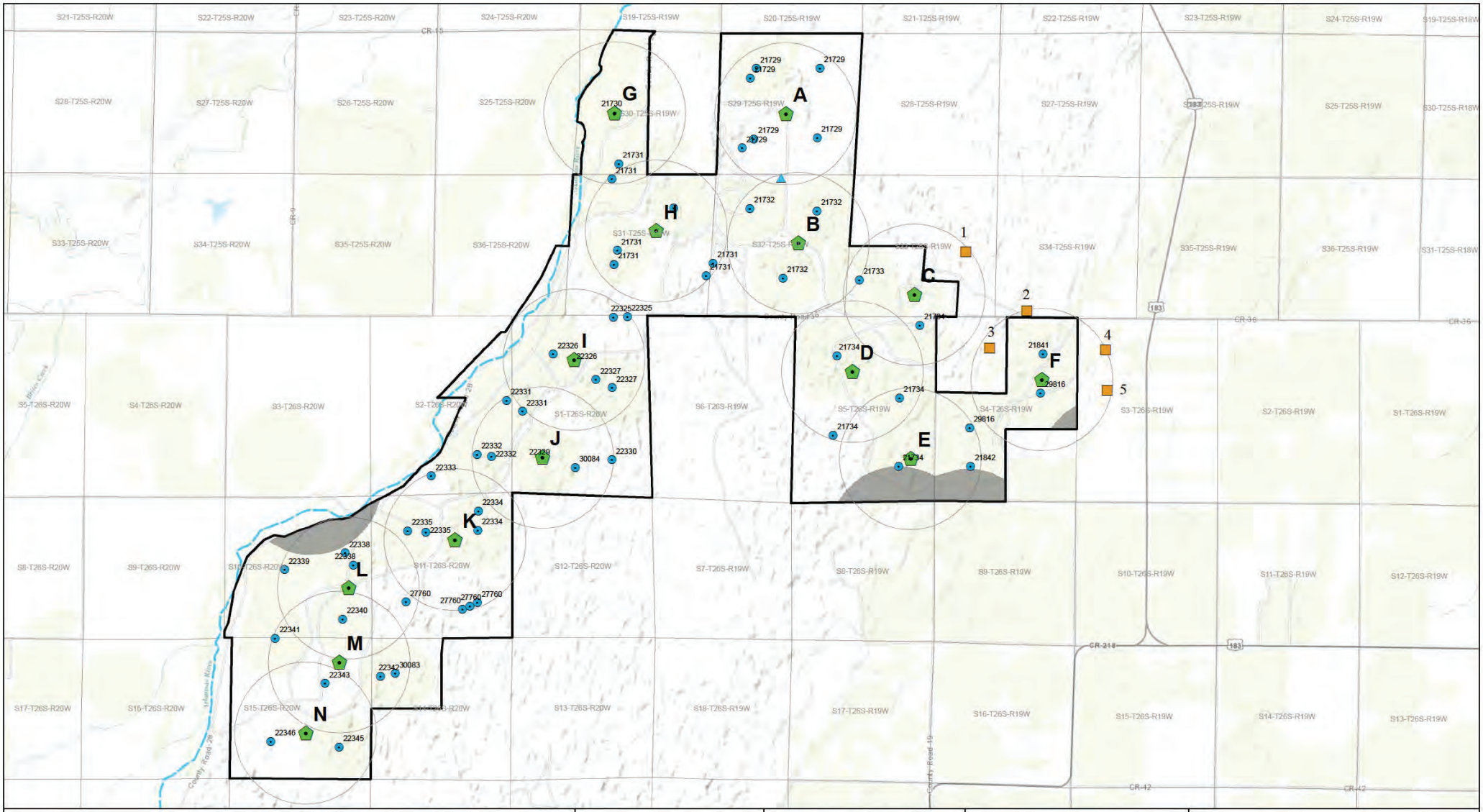
N

0 0.25 0.5 1 Miles

HAYS KANSAS

BURNS McDONNELL

EXHIBIT I



Legend

- Proposed Municipal Wells (A-N)
- Existing R9 Ranch Points of Diversion
- 1/2 Mile Buffer Around Proposed Wells
- PLSS Sections
- Area Excluded From Proposed Wells
- R9 Ranch Property Boundary
- Domestic Well (Non-Permitted)
- Stock Well (Non-Permitted)

1:40,000

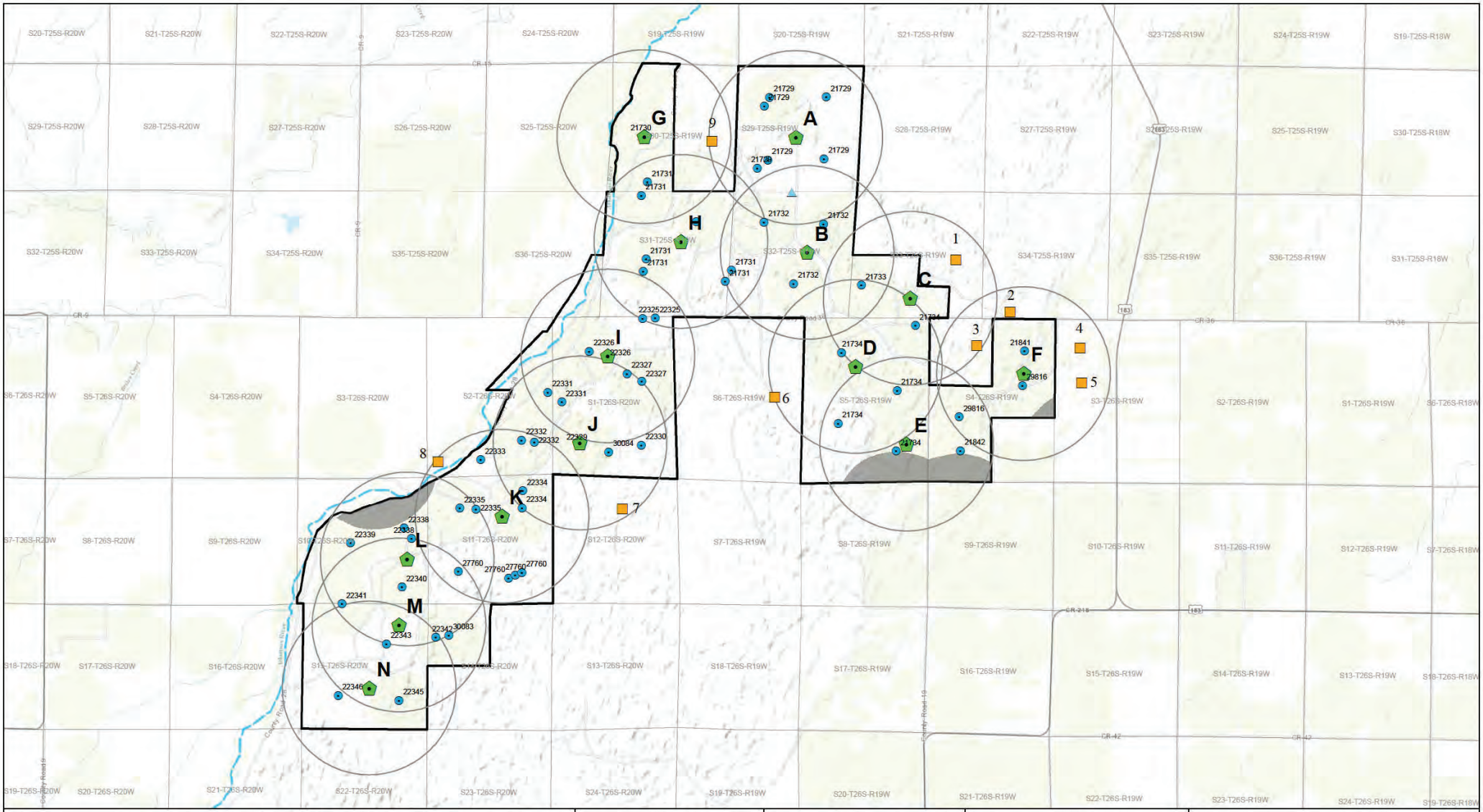
N

0 0.25 0.5 1 Miles

HAYS KANSAS

BURNS McDONNELL

EXHIBIT J



Legend

- Proposed Municipal Wells (A-N)
- Existing R9 Ranch Points of Diversion
- 3,640 Feet Buffer Around Proposed Wells
- PLSS Sections
- Area Excluded From Proposed Wells
- R9 Ranch Property Boundary
- Domestic Well (Non-Permitted)
- Stock Well (Non-Permitted)

1:45,000

N

0 0.25 0.5 1 Miles

HAYS KANSAS

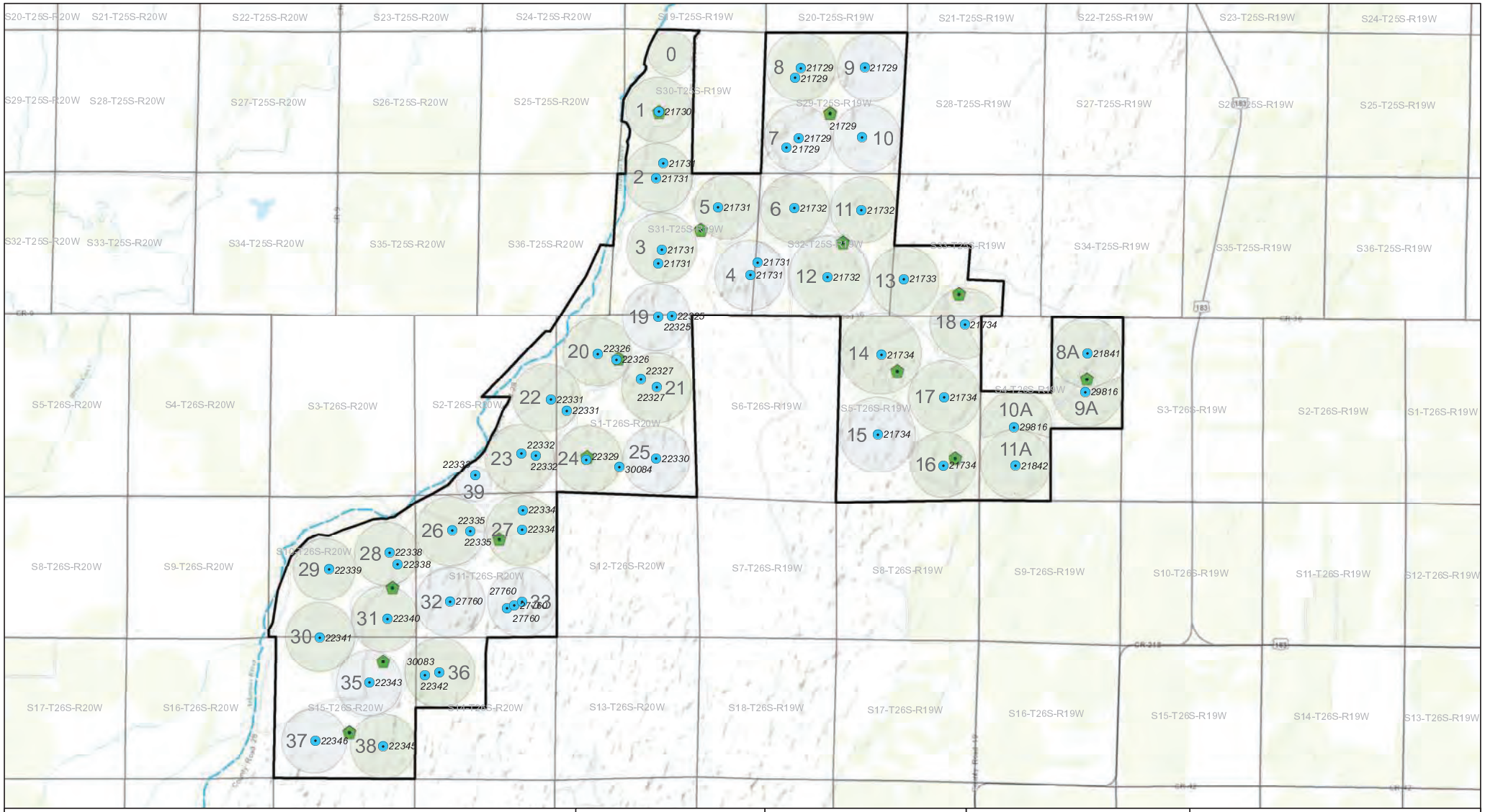
BURNS McDONNELL

EXHIBIT K

Exhibit L

1. Gregory C. & Lisa J.T. Ebert, P.O. Box 242, Kinsley, KS 67547
2. Kevin R. Schultz & Vera M. Rev Trust, 2048 280th Ave., Haviland, KS 67059
3. Gregory Ebert, P.O. Box 242, Kinsley, KS 67547
4. Monte L. & Douglas D. Hirsh, 103 Capital, Kinsley, KS 67547
5. Monte L. & Douglas D. Hirsh, 103 Capital, Kinsley, KS 67547
6. Tom Hammond, P.O. Box 3278, Viero Beach, FL 32964
7. Jennifer & Amy Mull, Attn: Glenn Mull, Pawnee Rock, KS 67567
8. Leroy A. & Steven D. Wetzel, 2167 20th Ave., Offerle, KS 67563
9. Randy A. & Tammie S. Schmidt, 905 Marsh Kinsley, KS 67547

EXHIBIT
L


S20-T25S-R20W
S21-T25S-R20W
S22-T25S-R20W
S23-T25S-R20W
S24-T25S-R20W
S19-T25S-R19W
S20-T25S-R19W
S21-T25S-R19W
S22-T25S-R19W
S23-T25S-R19W
S24-T25S-R19W
S29-T25S-R20W
S28-T25S-R20W
S27-T25S-R20W
S26-T25S-R20W
S25-T25S-R20W
S30-T25S-R19W
S29-T25S-R19W
S28-T25S-R19W
S27-T25S-R19W
S26-T25S-R19W
S25-T25S-R19W
S32-T25S-R20W
S33-T25S-R20W
S34-T25S-R20W
S35-T25S-R20W
S36-T25S-R20W
S31-T25S-R19W
S32-T25S-R19W
S33-T25S-R19W
S34-T25S-R19W
S35-T25S-R19W
S36-T25S-R19W
S5-T26S-R20W
S4-T26S-R20W
S3-T26S-R20W
S2-T26S-R20W
S1-T26S-R20W
S6-T26S-R19W
S5-T26S-R19W
S4-T26S-R19W
S3-T26S-R19W
S2-T26S-R19W
S1-T26S-R19W
S8-T26S-R20W
S9-T26S-R20W
S10-T26S-R20W
S11-T26S-R20W
S12-T26S-R20W
S7-T26S-R19W
S8-T26S-R19W
S9-T26S-R19W
S10-T26S-R19W
S11-T26S-R19W
S12-T26S-R19W
S17-T26S-R20W
S16-T26S-R20W
S15-T26S-R20W
S14-T26S-R20W
S13-T26S-R20W
S18-T26S-R19W
S17-T26S-R19W
S16-T26S-R19W
S15-T26S-R19W
S14-T26S-R19W
S13-T26S-R19W
0
1 21730
2 21731
3 21731 21731
4 21731 21731
5 21731
6 21732
7 21729 21729
8 21729 21729
9 21729
10
11 21732
12 21732
13 21733
14 21734
15 21734
16 21734
17 21734
18 21734
19 22325 22325
20 22326 22326
21 22327 22327
22 22331 22331
23 22332 22332
24 22329
25 22330 30084
26 22335 22335
27 22334 22334
28 22338 22338
29 22339
30 22341
31 22340
32 27760
33 27760 27760 27760
35 22343
36 30083 22342
37 22346
38 22345
39 22333
8A 21841
9A 29816
10A 29816
11A 21842
Legend
Proposed Municipal Wells (A-N)
Existing R9 Ranch Points of Diversion
Center Pivots - Approximate (0-39)
River Centerline
R9 Ranch Property Boundary
PLSS Sections
1:40,000
N
0 0.25 0.5 1
Miles
HAYS
KANSAS
BURNS McDONNELL
EXHIBIT
M