

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

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PUBLIC SERVICE
COMMISSION

In the Matter of:

APPLICATION OF NORTHERN KENTUCKY
WATER DISTRICT FOR APPROVAL OF
CONSTRUCTION OF STANDBY POWER
GENERATORS AND ISSUANCE OF A
CERTIFICATE OF CONVENIENCE
AND NECESSITY

)
) CASE NO. 2006-00506
)
)
)
)

APPLICATION FOR APPROVAL OF CONSTRUCTION

Northern Kentucky Water District (NKWD), by counsel, petitions for an order approving the construction of standby power generators at the Dudley Pump Station pursuant to KRS 278.020.

In support of the application, the following information is provided:

1. NKWD's office address is 2835 Crescent Springs Rd., Erlanger, KY 41018-0640. Its principal officers are listed in its current Annual Report on page 6, which is filed with the Commission as are its prior years Reports;
2. NKWD is a non-profit water district organized under Chapter 74 and has no separate articles of incorporation;
3. A description of NKWD's water system and its property stated at original cost by accounts is contained in its Annual Report, which is attached as Exhibit E.
4. NKWD serves retail customers in Kenton, Boone and Campbell Counties and

sells water at wholesale to non-affiliated water distribution systems in Kenton, Boone, Pendleton and Campbell Counties.

5. It proposes to construct standby power generators at its Dudley Pump Station as described in Exhibit A (Two copies of the Maps, Plans, Specifications and Bid Documents are provided as a separate bound document). The District is financing the project with \$1,500,000 of Bond Anticipation Notes (BAN) to be issued in 2007.

6. The construction is in the public interest and is required to allow NKWD to continue to provide adequate service to its customers. As a result of a Vulnerability Assessment in May, 2004, it was determined that a power failure at the Pump Station would disrupt water service to customers. The generators will allow pumps to operate during times of power failure. The project, its cost, need and other details are contained in Exhibit A.

7. The total project cost is approximately \$1,500,000 see Exhibits B and D.

8. Easements and rights of way are not required, see Exhibit B.

9. This service will not compete with any other utility in the area.

10. The proposed project, identified in Exhibit A, is scheduled to begin construction in February, 2007 and be completed by December, 2007. Board approval of the project was given on November 17, 2006, attached as Exhibit C. Bid information is included with Exhibit B. Bids expire on January 29, 2007.

11. No new franchises are required. No DOW or other permits are required. See Exhibit B.

12. Construction descriptions are in Exhibit A and Bid Documents. Facts relied on to justify the public need are included in the project descriptions in Exhibit A.

13. Maps of the area showing location of the proposed facilities are in Exhibit A.

14. The construction costs will be funded by the issuance of \$1,500,000 BANS.

15. Estimated operating costs for operation and maintenance, depreciation and debt service after construction to the extent that there are any are shown in Exhibit D.

16. A description of the facilities and operation of the system are in Exhibit A.

17. A full description of the route, location of the project, description of construction and related information is in Exhibit A.

18. The start date for construction; proposed in-service date; and total estimated cost of construction at completion are included in Exhibits A and B.

19. CWIP at end of test year is listed in Exhibit E.

20. Plant retirements are listed in Exhibit B and E. No salvage values are included as booked.

21. The use of the funds and need for the facilities is justified based on a the engineering report included as Exhibit A

22. No rate adjustment is being proposed.

23. The following information is provided in response to 807 KAR 5:001 (8):

a. Articles of Incorporation – None. NKWD is a statutorily created water district under KRS Chapter 74;

24. The following information is supplied pursuant to 807 KAR 5:001(9):

a. Facts relied upon to show that the application is in the public interest:
See Exhibit A.

25. The following information is provided as required by 807 KAR 5:001 (11):

a. A general description of the property is contained in the Annual Report, Exhibit E.

b. No stock is to be issued; No bonds are to be issued in this case;

c. There is no refunding or refinancing;

d. The proceeds of the financing are to construct the property described in

Exhibit A

e. The par value, expenses, use of proceeds, interest rates and other information is not applicable because no bonds are being issued at this time.

26. The following exhibits are provided pursuant to 807 KAR 5:001 (11)(2):

a. There are no trust deeds. All notes, indebtedness and mortgages are included in Exhibits E and F.

b. Property is to be constructed is described in Exhibit A.

27. The following information is provided pursuant to 807 KAR 5:001(6):

a. No stock is authorized.

b. No stock is issued.

c. There are no stock preferences.

d. Mortgages are listed in Exhibit F.

e. Bonds are listed in Exhibit F.

f. Notes are listed in Exhibit F.

g. Other indebtedness is listed in Exhibit F.

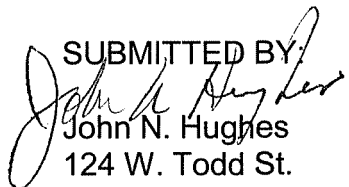
h. No dividends have been paid.

i. Current balance sheet; income statement and debt schedule are attached as Exhibits F and G.

k. The facilities being constructed will be reflected in USoA Account 310, Power Generating Equipment: \$1,500,000.

For these reasons, the District requests authorization to construct the facilities and

any other order or authorization that may be necessary to obtain Commission approval for construction.

SUBMITTED BY:

John N. Hughes
124 W. Todd St.
Frankfort, KY 40601

Attorney for Northern
Kentucky Water District

NORTHERN KENTUCKY WATER DISTRICT
CASE 2006 - 20526
DUDLEY PUMP STATION GENERATOR

NORTHERN KENTUCKY
WATER DISTRICT

RECEIVED

NOV 30 2006

PUBLIC SERVICE
COMMISSION

Project
Dudley Pump Station Generator

Kenton County
184-0445

NORTHERN KENTUCKY WATER DISTRICT
Dudley Pump Station Generator
184-0445

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<u>EXHIBIT</u>	<u>TITLE</u>
A	ENGINEERING REPORTS AND INFORMATION Copy of project map, Preliminary engineering report; Engineer's opinion of probable total construction cost; GRW plans titled "Dudley Pump Station Generator" dated October, 2006, sealed by a P.E.; GRW specifications titled "Dudley Pump Station Generator" dated October, 2006 and sealed by a P.E.
B	Certified statement from an authorized utility Official confirming: (1) Affidavit (2) Franchises (3) Plan review and permit status (4) Easements and Right-Of-Way status (5) Construction dates and proposed date in service (6) Plant retirements
C	BID INFORMATION AND BOARD RESOLUTION Bid tabulation, Engineer's recommendation of award, Board resolution. (Will be forwarded after Board motion)
D	PROJECT FINANCE INFORMATION Customers added and revenue effect, Debt issuance and source of debt, Additional costs and operating and maintenance, Depreciation cost and debt service after construction.
E	PSC ANNUAL REPORT - 2005
F	SCHEDULE OF MORTGAGES, BONDS, NOTES, AND OTHER INDEBTEDNESS
G	CURRENT BALANCE SHEET AND INCOME STATEMENT

Dudley Pump Station Generator

Project 184-0445

Project Description:

The proposed project involves the construction of two 1000 KW parallel standby generators at the Dudley Pump Station. The Dudley 1040 Pumping Station was constructed in 1965 and the Dudley 1080 Pumping Station was constructed in 1990. The pump station supplies water to the majority of Kenton County. The original design of the Dudley Pump Station did not include backup power capabilities. If a power outage is experienced, no water can be pumped to the service area. In May 2004, a Vulnerability Assessment was performed for the District which ranked the Dudley Pump Stations as critical assets. The assessment highly recommended that the District install backup power generators to its most critical facilities, including this facility. The generators will prevent interruptions to the water supply that may be experienced during a power grid failure.

The estimated cost of the total project is \$1,500,000.

Bids were opened on October 31, 2006. The bids will expire on January 29, 2007.

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

ENGINEERING REPORTS AND INFORMATION

Project Map

Preliminary Design Memorandum

Engineer's Opinion of Probable Total Construction Cost

Plans prepared by GRW titled "Dudley Pump Station Generator" dated June, 2006

Specifications prepared by GRW titled "Dudley Pump Station Generator" dated
June, 2006

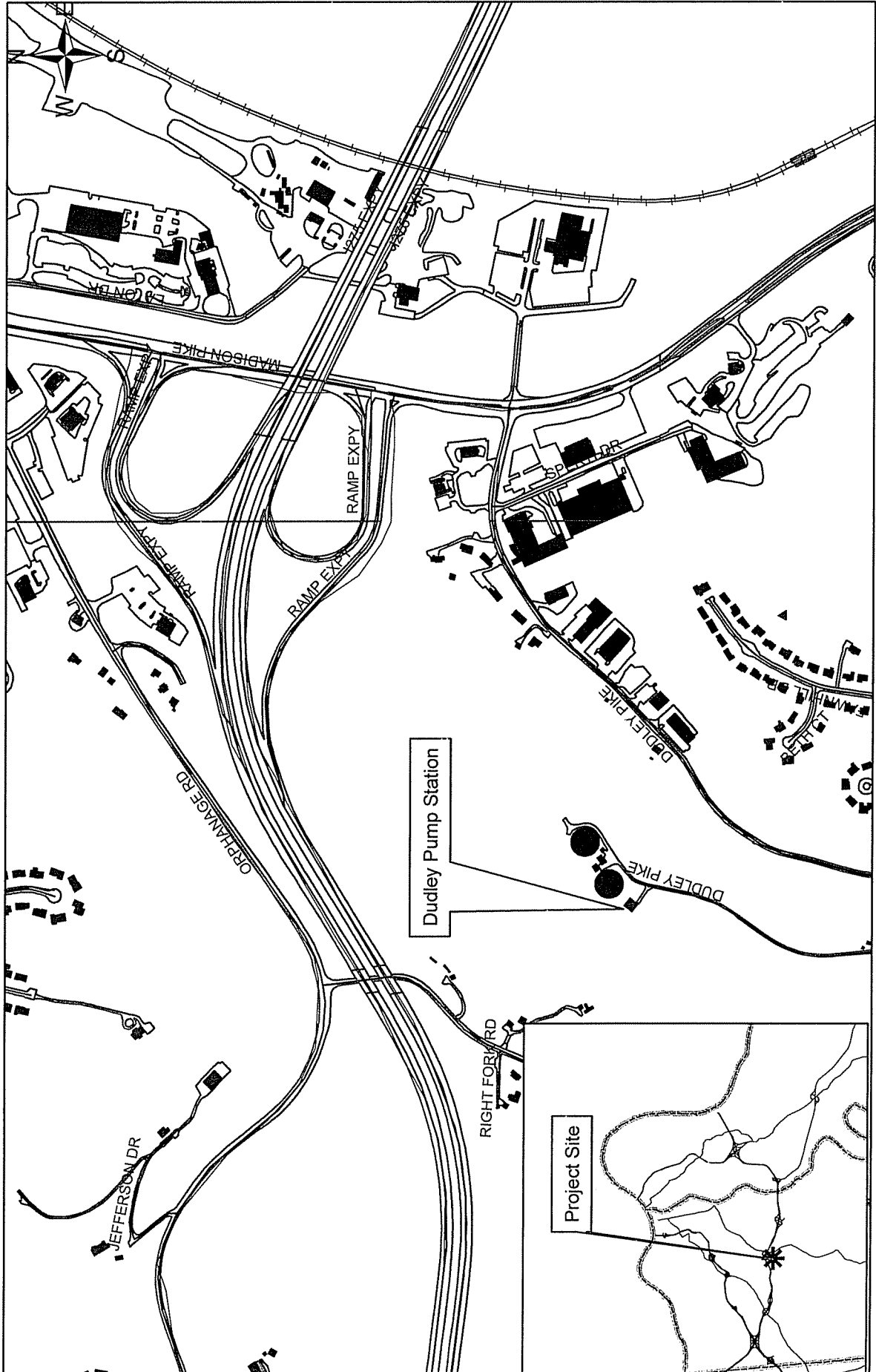
Case No. 2006-____
Exhibit _____ A _____

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

Project Map



Dudley Pump Station Standby Generator

Case No. 2006-_____
Exhibit A

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

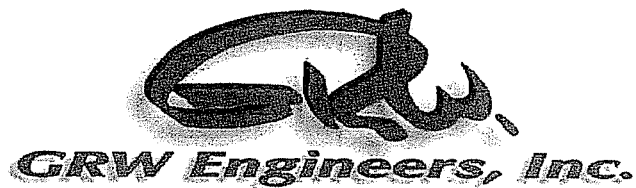
Kenton County
184-0445

Preliminary Design Memorandum

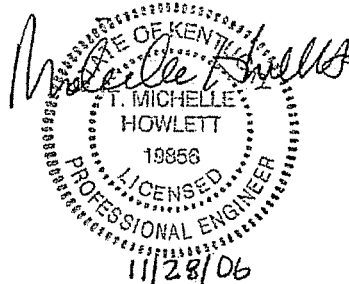
PRELIMINARY ENGINEERING REPORT

STANDBY EMERGENCY GENERATOR
DUDLEY PUMP STATION
FOR
NORTHERN KENTUCKY WATER DISTRICT

PREPARED BY



801 CORPORATE DRIVE
LEXINGTON, KY 40503
(859) 223-3999
www.grwinc.com



GRW PROJECT NO. 3462
Rev. 6/29/06

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INTRODUCTION

The Dudley Pump Station is located on Winding Trails Lane, off Dudley Pike in Edgewood, Kentucky. The site accommodates two 5M gallon ground storage tanks and two water booster pump stations. The facilities were originally constructed in the 1960's with additions in the 1980's. The pump stations are located in separate buildings between the storage tanks.

The first pump station is referred to as the "1040 Pump Station" and has four 250 horsepower pumps. The second pump station is referred to as the "1080 Pump Station" and has four 600 horsepower pumps.

EXISTING POWER SYSTEM

Power enters the site on the north side from a utility riser pole. The three-phase service is primary metered at 12,470 volts. The service enters underground to a substation on the site which is owned by Northern Kentucky Water District. The main disconnect is a 15KV, 600 Amp switch, with a primary feed to a 2500 KVA pad mounted transformer. The transformer secondary is bussed to a 4000 Amp switchboard located in a walk-in prefabricated housing within the substation fence.

The main switchboard includes a 4000 Amp main circuit breaker, and feeders to the pump stations. The main switchboard includes a 1600 Amp feeder breaker for the 1040 pump station which is connected to a motor control center within the 1040 pump station building. The main switchboard includes multiple feeder breakers for the 1080 pump station. Four individual 800 Amp feeder breakers serve the pump starters within the 1080 pump station building. In addition, a 600 Amp feeder breaker serves a separate motor control center within the 1080 pump station building. The 600 Amp MCC provides power to all other loads in the 1080 pump station in addition to the pumps.

The 1040 pumps are started via autotransformer, reduced voltage starters. The 1080 pumps are started via solid state, reduced voltage starters, which appear to have been installed fairly recently. All of these starters are designed to reduce inrush current during starting.

PROJECT SCOPE OF WORK

The scope of this project is to provide alternate power to both pump stations using standby generators. The generator sizing requirement shall provide adequate capacity to serve two pumps in each station, plus other loads associated with the pump stations including chemical feed equipment. The purpose of this report is to present various alternatives to accomplish this task, and to outline the proposed approach for design.

After the Preliminary Report has been reviewed and evaluated, detailed design will proceed. A geotechnical survey will be performed upon agreement to the location of the proposed equipment, and underground utilities located to verify new facilities locations and avoid potential field installation conflict.

The detailed design will include site plans, one line diagrams, control drawings, floorplans, details, and other information necessary for bidding purposes. Detailed specifications will include front-end and technical requirements for the project. Review of the detailed design will occur at 50% and 90% completion levels.

TECHNICAL APPROACH AND DESIGN ALTERNATIVES

There are multiple alternatives available for generator fuel sources, which include diesel, natural gas, and LP gas. It is proposed to provide standby power to the pump station using one or more diesel generator sets. This is the most cost effective alternative given the size required and available utilities.

Given the load characteristics, a total of 2000 KW generating capacity is required, which would serve two pumps in each station, plus all other loads in each station (lights, heat, controls, chemical feed, etc.) The generator is sized primarily for large motor starting requirements, so the size required for these stations does not change with the addition of small motors and non-motor loads.

Standby power can be accomplished by using a single generator, or multiple units in parallel. This report evaluates the use of a single 2000 KW unit, and two 1000 KW units in parallel.

With the single generator set, transfer of the load would be accomplished using an automatic transfer switch which senses incoming normal power, and upon loss of normal power, signals the generator to start. The switch transfers to the alternate source once emergency power is brought up to required voltage and frequency. With the two generator sets, paralleling switchgear is connected to both generator sources, and the emergency side of the transfer switch. Upon loss of normal power, both generators are signaled to start. The transfer switch transfers the load to emergency feed from the paralleling switchgear once both generator outputs are synchronized, and at required voltage and frequency. Under both scenarios, the transfer would be open-transition, meaning the load would be completely disconnected from the utility before transferring to the alternate source. This is in lieu of closed-transition, in which the generator(s) parallel the utility, which is generally prohibited by most electric utilities.

It is proposed that the generator(s) be located in a pre-fabricated housing furnished with the generator. For the single unit alternative, we have examined two types of enclosures. The first option includes a walk-in housing with space around the generator for a person to maneuver. The walk-in enclosure includes lighting, heat, panelboard, etc. The other option examined for both the single unit and the parallel unit includes an enclosure with removable panels which provide access to the generator and accessories, but the maintenance personnel would be outside the enclosure.

STANDBY EMERGENCY GENERATOR
DUDLEY PUMP STATION
NORTHERN KENTUCKY WATER DISTRICT

Both types of enclosures are available with various sound attenuation characteristics. For purposes of this report, we have included a level 2 sound rating both for the walk-in enclosure and non-walk-in enclosures, which provides for a maximum of 83 dBA noise generation above ambient at a distance 23 feet from the enclosure. We did not examine the option for the walk-in enclosures with multiple generator sets.

NKWD advised that the fuel storage requirements for this site would be 48 hours. A 6000 gallon fuel storage tank is required to meet this criteria. It is proposed that a separately mounted double-wall, above grade tank be provided, with a day tank at the generator. This arrangement is proposed for several reasons. The proposed generator location would not provide easy access to fueling trucks. In addition, a separately mounted tank allows for maintenance of either the generator or the fuel tank without disturbing the other.

Standby power will be connected such that any of the pumps can be operated during emergency mode, although only a maximum of two at each station. This means that the transfer switch or paralleling gear must be connected to all of the existing power system bussing. The easiest way to accomplish this is by connecting the transfer switch or paralleling gear ahead of the existing main switchboard bussing. It is proposed to disconnect the transformer secondary from the line side of the existing main breaker, and re-connect the transformer secondary to a new main circuit breaker. The new main circuit breaker is proposed for two reasons. First, the existing main circuit breaker is mounted integrally with the main switchboard and bussed together, making it difficult or impossible to connect the transfer equipment between the load side of the existing main breaker and the load. Second, current National Electrical Code requirements include ground fault protection for main circuit breakers of this size, which the existing main circuit breaker does not have.

Each pump can be operated locally in the hand mode, or in automatic mode with a start/stop signal from the station's telemetry equipment. It is proposed that the control system require manual re-start when the system has been transferred to standby power, either locally or through the SCADA system. This is easy to accomplish in the auto mode; a contact from the transfer switch can be provided to the SCADA system to indicate standby power, and the system can be programmed to require manual re-start under those conditions. Some hardwired modifications may be required to prevent automatic restart in the hand mode when the load is transferred to emergency.

In addition to transfer to standby power, it is proposed that low fuel, generator running, and general alarm signals be provided to the station RTU's. Low fuel measurement is proposed to be accomplished by the use of a discrete level device, but not with continuous fuel tank level measurement.

Each station has it's own RTU, each with an Allen-Bradley MicroLogix 555 PLC. There is space in each rack for three additional cards. There does not appear to be spare digital I/O available, therefore, it is planned that an additional DIO card will be added to each RTU.

In the auto mode, the SCADA system would be programmed to prevent simultaneous operation of more than two pumps at each station on standby power. It was discussed at the initial meeting that hardwired lockouts to prevent more than two pumps operational in the hand mode would not be required, as only qualified personnel would operate the pumps

STANDBY EMERGENCY GENERATOR
DUDLEY PUMP STATION
NORTHERN KENTUCKY WATER DISTRICT

during standby power. Signage will be added to each station to instruct operators not to start more than two pumps when the generator is running.

The new main circuit breaker and transfer switch or paralleling gear would be located in a pre-fabricated enclosure next to the existing switchboard housing. The existing fencing around the substation would require modification to accommodate the additional housing.

The generator is proposed to be located in the yard area between the two tanks. Location must be coordinated with existing water line piping through the area. The fuel tank is proposed to be located at the end of the drive on the north end of the site.

Tab 4 of this report includes preliminary one-line diagrams for proposed power system connections, and a site plan indicating proposed equipment locations. The as-built site plan does not appear to be completely accurate in comparisons with field measurements. The attached Drawing makes some corrections to the locations of structures as they relate to placement of proposed equipment. A more detailed site survey and site plan will be created for the Contract Documents.

As mentioned above, this report evaluates several alternatives for generator arrangement, and possible enclosure types. Another criteria for comparison is the lead time for a single unit versus multiple units. We have been advised by generator representatives that the lead time for 2000 KW and larger units is 16-20 weeks if ordered after November, 2006. We were not provided with information about lead times for large units if ordered prior to November, other than the delivery may be the same as if ordered in November. We were advised smaller units have a 3-4 week shorter delivery if ordered during the same time frame.

The following describes each option evaluated, and the estimated cost for each:

OPTION	DESCRIPTION	EST. COST	LEAD TIME
1	1-2000 KW Diesel Generator, 4000 Amp Automatic Transfer Switch, Walk-In Level 2 Sound Attenuated Enclosure	\$888,580	16-20 weeks
2	1-2000 KW Diesel Generator, 4000 Amp Automatic Transfer Switch, Non-Walk-In Level 2 Sound Attenuated Enclosure	\$833,580	16-20 weeks
3	2-1000 KW Diesel Generators, 4000 Amp Paralleling Switchgear, Separate Non-Walk-In Level 2 Sound Attenuated Enclosures	\$983,180	12-16 weeks

Note that Tab 2 of this report includes a more detailed cost estimate breakdown for each option.

EVALUATION OF OPTIONS

Each option above includes advantages and disadvantages which require consideration based on the needs and priorities of Northern Kentucky Water District.

The primary advantage of Option 1 is to the maintenance personnel. The enclosure with Option 1 includes a walk-in housing which has lighting and heat. The generator is more accessible, and the environment is one that is more user-friendly. In addition, there is a lesser requirement for engine coolant heating, and easier starting with the batteries in above-freezing temperatures. The disadvantages include additional cost, and substantial increase in footprint to the non-walk-in enclosure. In addition, Option 1 has the longest lead time.

The primary advantage of Option 2 is that it is the lowest cost option, and the smallest footprint. The disadvantages include long lead time, and less favorable access to the generator.

Option 3 has the advantage of generator redundancy. If one generator is out of service, the remaining unit can be used to operate half the emergency load. There is also the benefit of a shorter lead time with the smaller units. Option 3, however, has the highest cost, and there are two units to maintain. For this option, the two generators have relatively small non-walk-in enclosures, but the added footprint of another unit. The switchgear housing is required to be larger with this option to accommodate additional paralleling switchgear.

CODE AND REGULATORY CONSIDERATIONS

While there are many codes and requirements that apply to this project, there are a few particular items that warrant specific discussion.

As mentioned above, the existing main circuit breaker does not meet current National Electrical Code requirements for ground fault protection. This requirement likely did not exist when the service was constructed, but will be corrected as part of this project.

This size fuel tank is required by NFPA 30, Flammable and Combustible Liquids Code, to be located at least 15 feet from the property line, and at least 5 feet from the nearest side of any public way or "important building." It is our understanding that the property line on the north side of the site is the outside security fence.

The Environmental Protection Agency regulates emissions requirements for non-road diesel engines, which includes standby generators. The requirements are designated by "tier" levels, with Tier 1 being the least stringent, and Tier 4 being the most stringent. Currently, the requirements mandate that all engines over 560 KW be Tier 2 compliant by 2006. Tier 4 compliance is required by 2011. It is our understanding that the requirement applies to the date that the generator was manufactured, which may not necessarily coincide or relate to dates associated with this project. Given that it cannot be verified when the generator used for this project was manufactured, nor would we want to limit

suppliers to a window of manufacture, we plan to specify that the generator furnished must meet the EPA requirements that apply to the generator at the time the unit was manufactured.

CONSTRUCTION BUDGET VS. ESTIMATE

The total project budget is \$1.5 million. We assume the construction costs estimated and included in this report are within the amounts designated for construction.

SCHEDULE

The 50% design review is scheduled for August 8, 2006. The 90% schedule has not been discussed specifically, and we are unsure of the time required between design completion and advertisement. Given the equipment lead time, construction schedule recommended would be nine months to substantial completion. Below is a suggested schedule for design, bidding, and construction.

50% Design Review	August 8, 2006
90% Design Review	September 19, 2006
Bidding Documents	October 6, 2006
Advertisement	October 10, 2006
Project Bid	October 31, 2006
Award	mid-November, 2006
Substantial Completion	mid-August, 2007
Final Completion	September, 2007

QuickSize Generator Set Sizing

Project NKWD Dudley Pump Station
Customer

Generator Set

Model No. 1820REOZDB *Round up to 2000 kW*
Engine 16V4000 (Diesel) Gensets 1
Alternator 7M4052

Performance Summary

LN / LL Voltage	277/480	volts	Altitude	500	feet
Frequency	60	hertz	Ambient Temp.	70	F
Phase(s)	3	phase			

Genset Rating @ 130C Rise	1820.00 kW
Genset Derated Rating	1820.00 kW
Total Running Power	1452.40 kW
Percent of Available kW Used	79.80 %

Alternator Starting kVA	3142.86 kVA @ 20% dip
Peak Starting kVA	2135.58 kVA
Percent of Available kVA Used	67.95 %

Maximum Voltage Dip	10.89 %
Maximum Frequency Dip	0.46 % (no restriction)
Voltage THD	0.00 % (no restriction)

Informational

Program Version	8.2.0
Database Version	1.18

Project Created	June 4, 2006; 02:40:48 PM
Project Last Saved	June 4, 2006; 02:51:11 PM
Report Created	June 18, 2006; 06:00:11 PM

Project Created By

QuickSize Generator Load Profile

Project NKWD Dudley Pump Station
Customer

Generator Set

Model No. 1820REOZDB **Gensets** 1
Engine 16V4000 (Diesel)
Alternator 7M4052

Load Profile

	Qty	Run kW	Run kVA	Run pF	Start kW	Start kVA	Volt Dip	Freq Dip	Volt (L-N) THD
Step #1 Load Step #1									
Miscellaneous loads (20.00 kW misc. load)									
	1	20.00	20.00	1.00	20.00	20.00			
Electric heaters (54.00 kW misc. load)									
	1	54.00	54.00	1.00	54.00	54.00			
Exhaust fan (5.00 HP, 3 phase, code H, loaded motor, w/ A.T.L. starting)									
Rated motor torque from full voltage starting = 79.4%									
	1	4.80	5.40	0.89	20.10	33.50			
Exhaust fan (5.00 HP, 3 phase, code H, loaded motor, w/ A.T.L. starting)									
Rated motor torque from full voltage starting = 79.4%									
	1	4.80	5.40	0.89	20.10	33.50			
Exhaust fan (5.00 HP, 3 phase, code H, loaded motor, w/ A.T.L. starting)									
Rated motor torque from full voltage starting = 79.4%									
	1	4.80	5.40	0.89	20.10	33.50			
1080 Pump (600.00 HP, 3 phase, code F, loaded motor, w/ 300% solid start starting)									
Rated motor torque from full voltage starting = 19.8%									
	1	480.00	526.00	0.91	252.48	1578.00			
Step Totals		568.40	610.41	0.93	386.78	1683.11	10.89	0.46	0.0%/0.0%/0.0%
Cum. Totals		568.40	610.41	0.93					
Step #2 Load Step #2									
1040 Pump (250.00 HP, 3 phase, code F, loaded motor, w/ 65% Autotransformer starting)									
Rated motor torque from full voltage starting = 39.0%									
	1	202.00	223.00	0.91	137.14	596.25			
Step Totals		202.00	223.00	0.91	137.14	596.25	3.90	0.06	0.0%/0.0%/0.0%
Cum. Totals		770.40	833.41	0.92					
Step #3 Load Step #3									
1080 Pump (600.00 HP, 3 phase, code F, loaded motor, w/ 300% solid start starting)									
Rated motor torque from full voltage starting = 20.1%									
	1	480.00	526.00	0.91	252.48	1578.00			
Step Totals		480.00	526.00	0.91	252.48	1578.00	10.43	0.20	0.0%/0.0%/0.0%
Cum. Totals		1250.40	1359.41	0.92					
Step #4 Load Step #4									
1040 Pump (250.00 HP, 3 phase, code F, loaded motor, w/ 65% Autotransformer starting)									
Rated motor torque from full voltage starting = 38.9%									
	1	202.00	223.00	0.91	137.14	596.25			

Step Totals	202.00	223.00	0.91	137.14	596.25	4.01	0.06	0.0%/0.0%/0.0%
Cum. Totals	1452.40	1582.41	0.92					

nd Totals	1452.40	1582.41	0.92					0.0%/0.0%/0.0%
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Informational

Program Version 8.2.0

Database Version 1.18

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Report Created June 18, 2006; 06:00:29 PM

Project Created By

Model: **2000REOZDB**

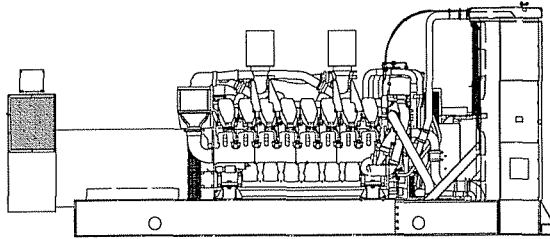
KOHLER POWER SYSTEMS

380-4160 V
4-Cycle Diesel



Ratings Range

	60 Hz	50 Hz
Standby:	kW 1590-2000	1496-1760
	kVA 1988-2500	1870-2200
Prime:	kW 1440-1820	1376-1600
	kVA 1800-2275	1720-2000



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- At 60 Hz, the generator set accepts rated load in one step.
- The generator set complies with ISO 8528-5, Class G3 requirements for transient performance.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA).
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator features:
 - The brushless, rotating-field alternator has broadrange reconnectability.
 - The pilot-excited, permanent-magnet (PM) alternator provides superior short-circuit capability.
- Other features:
 - Controllers are available for all applications. See controller features inside.
 - The generator set-to-skid mounting on 60 Hz models is direct mounting. The 50 Hz model mounting options include integral vibration isolation or direct mounting with spring isolators.
 - Electronic engine controls manage the engine.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	150°C Rise Standby Rating		130°C Rise Standby Rating		125°C Rise Prime Rating		105°C Rise Prime Rating	
				kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps
7M4054	220/380	3	60	1590/1988	3020	1590/1988	3020	1440/1800	2735	1440/1800	2735
	240/416	3	60	1840/2300	3192	1840/2300	3192	1800/2250	3123	1680/2100	2915
	277/480	3	60	2000/2500	3007	2000/2500	3007	1820/2275	2736	1820/2275	2736
	220/380	3	50	1584/1980	3008	1528/1910	2902	1496/1870	2841	1400/1750	2659
	230/400	3	50	1624/2030	2930	1536/1920	2771	1536/1920	2771	1424/1780	2569
	240/416	3	50	1608/2010	2790	1496/1870	2595	1496/1870	2595	1376/1720	2387
7M4056	220/380	3	60	1850/2313	3513	1790/2238	3400	1680/2100	3191	1630/2038	3096
	240/416	3	60	2000/2500	3470	1950/2438	3383	1820/2275	3157	1780/2225	3088
	277/480	3	60	2000/2500	3007	2000/2500	3007	1820/2275	2736	1820/2275	2736
	220/380	3	50	1760/2200	3343	1760/2200	3343	1600/2000	3039	1600/2000	3039
	230/400	3	50	1760/2200	3175	1760/2200	3175	1600/2000	2887	1600/2000	2887
	240/416	3	50	1760/2200	3053	1736/2170	3012	1600/2000	2776	1568/1960	2720
7M4058	220/380	3	60	2000/2500	3798	1950/2438	3703	1820/2275	3457	1790/2238	3400
	240/416	3	60	2000/2500	3470	2000/2500	3470	1820/2275	3157	1820/2275	3157
	277/480	3	60	2000/2500	3007	2000/2500	3007	1820/2275	2736	1820/2275	2736
	220/380	3	50	1760/2200	3343	1744/2180	3312	1600/2000	3039	1600/2000	3039
	230/400	3	50	1760/2200	3175	1760/2200	3175	1600/2000	2887	1600/2000	2887
	240/416	3	50	1760/2200	3053	1760/2200	3053	1600/2000	2776	1600/2000	2776
7M4176	220/380	3	60	2000/2500	3798	2000/2500	3798	1820/2275	3457	1820/2275	3457
7M4292	347/600	3	60	2000/2500	2406	2000/2500	2406	1820/2275	2189	1820/2275	2189
7M4374	2400/4160	3	60	2000/2500	347	2000/2500	347	1820/2275	316	1820/2275	316
	1905/3300	3	50	1744/2180	381	1600/2000	350	1600/2000	350	1448/1810	317

RATINGS: All three-phase units are rated at 0.8 power factor. **Standby Ratings:** Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3048/1, BS 5514, AS 2789, and DIN 6271. **Prime Power Ratings:** Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3048/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. **GENERAL GUIDELINES FOR DERATION:** ALTITUDE: Derate 1% per 100 m (328 ft.) elevation above 400 m (1312 ft.). TEMPERATURE: Derate 2.0% per 5°C (9°F) temperature above 40°C (104°F).

Alternator Specifications

Specifications	Alternator
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H, Synthetic, Nonhygroscopic
Temperature rise	130°C, 150°C Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Rotor balancing	125% 60 Hz, 150% 50 Hz
Voltage regulation, no-load to full-load (with <0.5% drift due to temp. variation)	3-phase sensing, ±0.25%
One-step load acceptance at 60 Hz	100% of Rating
Unbalanced load capability	100% of Rated Standby Current
Peak motor starting kVA:	(35% dip for voltages below)
380 V	7M4176 (4 bus bar) .. 5400 (60 Hz)
480 V, 380 V	7M4054 (4 bus bar) .. 7000 (60 Hz), 4800 (50 Hz)
480 V, 380 V	7M4056 (4 bus bar) .. 7200 (60 Hz), 5200 (50 Hz)
480 V, 380 V	7M4058 (4 bus bar) .. 11000 (60 Hz), 6600 (50 Hz)
600 V	7M4292 (4 bus bar) .. 4250 (60 Hz)
4160 V, 3300 V	7M4374 (6 lead) 6200 (60 Hz), 3750 (50 Hz)

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	Detroit Diesel/MTU	
Engine: model	16V4000 (T163-7M36)	16V4000 (T163-7M35)
Engine: type	4-Cycle, Turbocharged, Intercooled	
Cylinder arrangement	16V	
Displacement, L (cu. in.)	65 (3967)	
Bore and stroke, mm (in.)	165 (6.5) x 190 (7.5)	
Compression ratio	15.5:1	
Piston speed, m/min. (ft./min.)	684 (2244)	570 (1870)
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	2190 (2936)	1940 (2600)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve (exhaust) material	High Alloy Steel	
Governor: type, make/model	MDEC Electronic Control	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±0.25%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Exhaust flow at rated kW, m ³ /min. (cfm)	426 (15044)	354 (12501)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	450 (842)	490 (914)
Maximum allowable back pressure, kPa (in. Hg)	5.1 (1.5)	
Exhaust outlet size at engine hookup, mm (in.)	2 @ 254 (10)	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)		Negative
Volts (DC)		24
Ampere rating		70
Starter motor rated voltage (DC)		Dual, 24
Battery, recommended cold cranking amps (CCA):		
Quantity, CCA rating each		Four, 1150
Battery voltage (DC)		12

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, mm (in.)	20 (0.79)	
Fuel return line, min. ID, mm (in.)	20 (0.79)	
Max. fuel flow, Lph (gph)	1380 (364)	1260 (332)
Min./max. fuel pressure at engine supply connection, kPa (in. Hg)	10 (3)/150(44)	
Fuel filter	One, Secondary	
Recommended fuel	#2 Diesel	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, dipstick mark max., L (qt.)	230 (243)	
Engine oil capacity, initial filling, L (qt.)	290 (306)	
Oil filter: quantity, type	4, Spin-On	
Oil cooler	Water-Cooled	

Application Data

Cooling

Radiator System	60 Hz	50 Hz
Ambient temp., standby rating, °C (°F)	40 (104)	45 (113)
Ambient temp., prime rating, °C (°F)	45 (113)	50 (122)
Engine water capacity, L (gal.)	227 (60)	
Radiator system capacity, including engine, L (gal.)	625 (165)	
Engine jacket water flow, Lpm (gpm)	1268 (335)	1033 (273)
Charge cooler water flow, Lpm (gpm)	647 (171)	485 (128)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	991 (56350)	790 (44450)
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	560 (31850)	331 (18800)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	2057 (81)	
Fan, kWm (HP)	86 (115)	68 (91)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)	

High Ambient Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)	50 (122)	—
Engine water capacity, L (gal.)	227 (60)	—
Radiator system capacity, including engine, L (gal.)	719 (190)	—
Engine jacket water flow, Lpm (gpm)	1268 (335)	—
Charge cooler water flow, Lpm (gpm)	647 (171)	—
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	991 (56350)	—
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	560 (31850)	—
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	2362 (93)	—
Fan, kWm (HP)	86 (115)	—
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)	—

Remote Radiator System*	60 Hz	50 Hz
Connection sizes:	Class 150 ANSI Flange	
Water inlet, mm (in.)	191 (7.5) Bolt Circle	—
Water outlet, mm (in.)	191 (7.5) Bolt Circle	—
Intercooler inlet/outlet, mm (in.)	152 (6.0) Bolt Circle	—
Static head allowable above engine, kPa (ft. H ₂ O)	149 (50)	—

* Contact your local distributor for cooling system options and specifications based on your specific requirements.

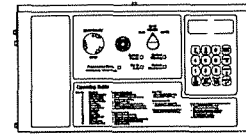
Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m ³ /min. (scfm)†	2132 (75300)	1889 (66700)
High ambient radiator-cooled cooling air, m ³ /min. (scfm)†	3047 (107600)	—
Cooling air required for generator set when equipped with CWC or remote radiator, based on 14°C (25°F) rise, m ³ /min. (scfm)†	668 (23600)	—
Combustion air, m ³ /min. (cfm)	174 (6145)	132 (4662)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	90 (5100)	—
Alternator, kW (Btu/min.)	97 (5516)	—

† Air density = 1.20 kg/m³ (0.075 lbm/ft³)

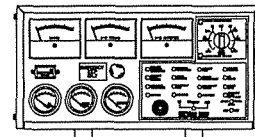
Fuel Consumption	60 Hz	50 Hz
Diesel, Lph (gph) at % load	Standby Rating	
100%	520.0 (137.4)	446.9 (118.1)
75%	395.8 (104.6)	328.4 (86.7)
50%	274.1 (72.4)	226.9 (59.9)
25%	154.4 (40.8)	127.7 (33.7)
Diesel, Lph (gph) at % load	Prime Rating	
100%	451.4 (119.3)	401.3 (106.0)
75%	342.1 (90.4)	299.4 (79.1)
50%	238.6 (63.0)	207.9 (54.9)
25%	135.1 (35.7)	117.4 (31.0)

Controllers



Decision-Maker™ 550 Controller

Audiovisual annunciation with NFPA 110 Level 1 capability. Programmable microprocessor logic and digital display features. Alternator safeguard circuit protection. 12- or 24-volt engine electrical system capability. Remote start, remote annunciation, and remote communication options. Refer to G6-46 for additional controller features and accessories.



Decision-Maker™ 3+, 16-Light Controller

Audiovisual annunciation with NFPA 110 Level 1 capability. Microprocessor logic, AC meters, and engine gauge features. 12- or 24-volt engine electrical system capability. Remote start, prime power, and remote annunciation options. Refer to G6-30 for additional controller features and accessories.

Operating @ roughly 75%
Capacity:
tank size:
104.6 galle/hr X 48 hrs
= 5020 galle
↓
use 6000 gallon tank

Standard Features and Accessories

Additional Standard Features

- Alternator Protection (standard with 550 controller)
- Oil Drain Extension
- Operation and Installation Literature

Accessories

Enclosed Unit

- Sound Enclosure and Subbase Fuel Tank Packages
- Weather Enclosure and Subbase Fuel Tank Packages

Open Unit

- Exhaust Silencer, Critical
60 Hz Kit: PA-361625
50 Hz Kit: PA-361617
- Exhaust Silencer, Hospital
60 Hz Kit: PA-361627
50 Hz Kit: PA-361626
- Flexible Exhaust Connector, Stainless Steel

Cooling System

- Block Heater; Recommended for Ambient Temperatures Below 10°C (50°F)
- City Water Cooling
- High Ambient Radiator
- Remote Radiator Cooling

Fuel System

- Flexible Fuel Lines
- Fuel/Water Separator
- Subbase Fuel Tank with Day Tank

Electrical System

- Battery
- Battery Charger, Equalize/Float Type
- Battery Charger, Equalize/Float Type Installed
- Battery Heater
- Battery Rack and Cables

Engine and Alternator

- Air Cleaner, Heavy Duty
- Air Cleaner Restriction Indicator
- Bus Bar Kits (standard on 7M alternators, 380-600 volt only)
- Closed Crankcase Breather
- Direct Mounting (50 Hz)
- Engine Fluids (oil and coolant) Added
- Alternator Strip Heater
- Integral Vibration Isolation Mounting (50 Hz)
- Line Circuit Breaker (NEMA type 1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)
- Optional Alternators
- Rated Power Factor Testing
- Safeguard Breaker (not available with 550 controller)
- Spring Isolators (50/60 Hz)

Paralleling System

- Load-Sharing Module
- Voltage Adjust Control

Maintenance and Literature

- General Maintenance Literature Kit
- Maintenance Kit
- NFPA 110 Literature
- Overhaul Literature Kit
- Production Literature Kit

Controller

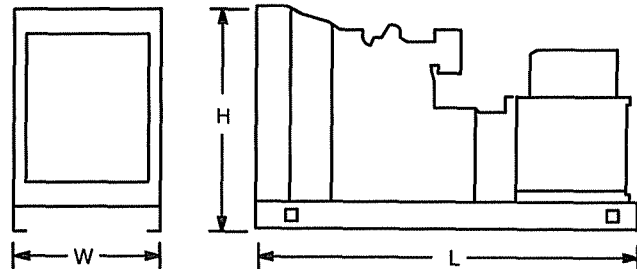
- Common Failure Relay Kit
- Communication Products and PC Software (550 controller only)
- Customer Connection Kit
- Dry Contact Kit (isolated alarm)
- Prime Power Switch (550 controller only)
- Remote Annunciator Panel
- Remote Audiovisual Alarm Panel
- Remote Emergency Stop Kit
- Remote Mounting Cable
- Run Relay Kit

Miscellaneous Accessories

- _____
- _____
- _____
- _____

Dimensions and Weights

Overall Size, L x W x H, max., mm (in.): 6235 x 2232 x 2513
 (245.46 x 87.88 x 98.94)
 Weight (radiator model), wet, max., kg (lb.): 15876 (35000)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

QuickSize Generator Set Sizing

Project NKWD Dudley Pump Station
Customer

Generator Sets

Model No. 900ROZD4 *Round up to 1000 kW* Gensets 2
Engine 16V2000 G80 (Diesel)
Alternator 5M4038

Performance Summary

LN / LL Voltage	277/480	volts	Altitude	500	feet
Frequency	60	hertz	Ambient Temp.	70	F
Phase(s)	3	phase			

Genset Rating @ 130C Rise	910.00 kW
Genset Derated Rating	910.00 kW
Total Running Power	726.20 kW per set
Percent of Available kW Used	79.80 %

Alternator Starting kVA	1742.86 kVA per set @ 20% dip
Peak Starting kVA	1067.79 kVA per set
Percent of Available kVA Used	61.27 %

Maximum Voltage Dip	9.94 %
Maximum Frequency Dip	0.69 % (no restriction)
Voltage THD	0.00 % (no restriction)

Informational

Program Version	8.2.0
Database Version	1.18

Project Created	June 4, 2006; 02:40:48 PM
Project Last Saved	June 18, 2006; 03:05:06 PM
Report Created	June 18, 2006; 06:00:54 PM

Project Created By

Step Totals	202.00	223.00	0.91	137.14	596.25	3.62	0.09	0.0%/0.0%/0.0%
Cum. Totals	1452.40	1582.41	0.92					

nd Totals	1452.40	1582.41	0.92					0.0%/0.0%/0.0%
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Informational

Program Version 8.2.0
Database Version 1.18

Project Created June 4, 2006; 02:40:48 PM
Project Last Saved June 18, 2006; 03:05:06 PM
Report Created June 18, 2006; 06:00:49 PM

Project Created By

Model: **1000REOZDB**

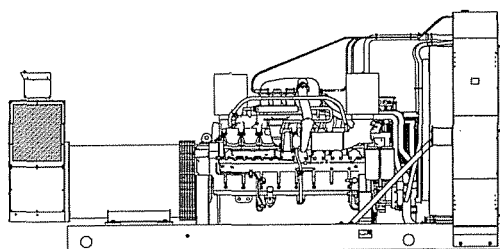
KOHLER POWER SYSTEMS

380-600 V
4-Cycle Diesel



Ratings Range

		60 Hz	50 Hz
Standby:	kW	945-1000	800
	kVA	1181-1250	1000
Prime:	kW	860-910	728-732
	kVA	1075-1138	910-915



Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- At 60 Hz the generator set accepts rated load in one step.
- The generator set complies with ISO 8528-5, Class G3 requirements for transient performance.
- The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA).
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are also available.
- Alternator features:
 - The pilot-excited, permanent-magnet (PM) alternator provides superior short-circuit capability.
 - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
 - Controllers are available for all applications. See controller features inside.
 - The low coolant level shutdown prevents overheating (standard on radiator models only).
 - The generator set-to-skid mounting options are either integral vibration isolation or direct mounting with spring isolators.
 - An electronic, isochronous governor delivers precise frequency regulation.
 - Electronic engine controls and a generator set microprocessor controller combine to deliver one of the most advanced control systems in today's market.

Generator Set Ratings

Alternator	Voltage	Ph	Hz	150°C Rise Standby Rating		130°C Rise Standby Rating		125°C Rise Prime Rating		105°C Rise Prime Rating	
				kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps
5M4044	240/416	3	60	1000/1250	1735	975/1219	1691	910/1138	1579	890/1113	1544
	277/480	3	60	1000/1250	1504	1000/1250	1504	910/1138	1368	910/1138	1368
	220/380	3	50	800/1000	1519	800/1000	1519	728/910	1383	728/910	1383
	230/400	3	50	800/1000	1443	800/1000	1443	728/910	1313	728/910	1313
	240/416	3	50	800/1000	1388	800/1000	1388	728/910	1263	728/910	1263
7M4046	220/380	3	60	945/1181	1795	945/1181	1795	860/1075	1633	860/1075	1633
	240/416	3	60	1000/1250	1735	1000/1250	1735	910/1138	1579	910/1138	1579
	222/480	3	60	1000/1250	1504	1000/1250	1504	910/1138	1368	910/1138	1368
	220/380	3	50	800/1000	1519	800/1000	1519	728/910	1383	728/910	1383
	230/400	3	50	800/1000	1443	800/1000	1443	728/910	1313	732/915	1321
240/416	3	50	800/1000	1388	800/1000	1388	728/910	1263	728/910	1263	
7M4170	220/380	3	60	1000/1250	1899	1000/1250	1899	910/1138	1728	910/1138	1728
7M4282	347/600	3	60	1000/1250	1203	1000/1250	1203	910/1138	1095	910/1138	1095
7M4284	347/600	3	60	1000/1250	1203	1000/1250	1203	910/1138	1095	910/1138	1095

RATINGS: All three-phase units are rated at 0.8 power factor. **Standby Ratings:** Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. **Prime Power Ratings:** Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. Obtain the technical information bulletin (TIB-101) on ratings guidelines for the complete ratings definitions. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. **GENERAL GUIDELINES FOR DERATION:** *Altitude:* Derate 1.0% per 100 m (328 ft.) elevation above 400 m (1312 ft.). *Temperature:* Derate 3.0% per 5.0°C (9°F) temperature above 40°C (104°F).

Alternator Specifications

Specifications	Alternator
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet Pilot Exciter
Voltage regulator	Solid-State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H, Synthetic, Nonhygroscopic
Temperature rise	130°C, 150°C Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Rotor balancing	125% 60 Hz, 150% 50 Hz
Voltage regulation, no-load to full-load (with < 0.5% drift due to temp. variation)	3-Phase Sensing, ±0.25%
One-step load acceptance	100% of Rating
Unbalanced load capability	100% of Rated Standby Current
Peak motor starting kVA:	(35% dip for voltages below)
480 V, 416 V 5M4044 (4 bus bar) ..	3900 (60 Hz), 3100 (50 Hz)
480 V, 416 V 7M4046 (4 bus bar) ..	3900 (60 Hz), 3050 (50 Hz)
380 V 7M4170 (4 bus bar) ..	2600 (60 Hz)
600 V 7M4282 (4 bus bar) ..	1850 (60 Hz)
600 V 7M4284 (4 bus bar) ..	3200 (60 Hz)

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- Digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- Brushless alternator with brushless pilot exciter for excellent load response.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	Detroit Diesel/MTU	
Engine: model	16V2000 G83 R163-7M36	16V2000 G63 R163-7M38
Engine: type	4-Cycle, Turbocharged, Intercooled	
Cylinder arrangement	16-V	
Displacement, L (cu. in.)	31.84 (1943)	
Bore and stroke, mm (in.)	130 (5.12) x 150 (5.91)	
Compression ratio	14.0:1	16.0:1
Piston speed, m/min. (ft./min.)	540 (1772)	450 (1476)
Main bearings: quantity, type	9, Precision Half Shells	
Rated rpm	1800	1500
Max. power at rated rpm, kWm (BHP)	1115 (1495)	895 (1200)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve (exhaust) material	Austenitic Steel	
Governor: type, make/model	MDEC Electronic Control	
Frequency regulation, no-load to-full load	Isochronous	
Frequency regulation, steady state	±0.25%	
Frequency	Fixed	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust flow at rated kW, m ³ /min. (cfm)	240 (8475)	180 (6357)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	590 (1094)	570 (1058)
Maximum allowable back pressure, kPa (in. Hg)	5.1 (1.5)	
Exh. outlet size at eng. hookup, mm (in.)	See ADV drawing	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)		Negative
Volts (DC)		24
Ampere rating		70
Starter motor rated voltage (DC)		24
Battery, recommended cold cranking amps (CCA):		
Qty., CCA rating each		Two, 1150
Battery voltage (DC)		12

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, mm (in.)		12 (0.5)
Fuel return line, min. ID, mm (in.)		6 (0.25)
Max. fuel flow, Lph (gph)		450 (119)
Min./max. fuel pressure at engine supply connection, kPa (in. Hg)		-30 (-8.8) / 50 (14.8)
Fuel filter: quantity, type		1, Secondary
Recommended fuel		#2 Diesel

Lubrication

Lubricating System	60 Hz	50 Hz
Type		Full Pressure
Oil pan capacity dipstick mark max., L (qt.)		92 (97.2)
Oil pan capacity, initial filling, L (qt.)		102 (108)
Oil filter: quantity, type		2, Cartridge
Oil cooler		Water-Cooled

Application Data

Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, standby rating, °C (°F)	40 (104)	45 (113)
Ambient temperature, prime rating, °C (°F)	45 (113)	50 (122)
Engine water capacity, L (gal.)	130 (34)	
Radiator system capacity, including engine, L (gal.)	257 (68)	
Engine jacket water flow, Lpm (gpm)	967 (255)	817 (216)
Charge cooler water flow, Lpm (gpm)	283 (75)	233 (62)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	480 (27297)	370 (21041)
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	290 (16492)	200 (11374)
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1372 (54)	
Fan, kWm (HP)	51 (68)	44 (59)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)	

High Ambient Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)	50 (122)	—
Engine water capacity, L (gal.)	130 (34)	—
Radiator system capacity, including engine, L (gal.)	322 (85)	—
Engine jacket water flow, Lpm (gpm)	967 (255)	—
Charge cooler water flow, Lpm (gpm)	283 (75)	—
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	480 (27297)	—
Heat rejected to charge cooling water at rated kW, dry exhaust, kW (Btu/min.)	290 (16492)	—
Water pump type	Centrifugal	
Fan diameter, including blades, mm (in.)	1524 (60)	
Fan, kWm (HP)	70 (94)	—
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)	

Remote Radiator System*	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes:		
Water inlet/outlet, mm (in.)	77 (3)	
Intercooler inlet/outlet, mm (in.)	51 (2)	
Static head allowable above engine, kPa (ft. H ₂ O)	149 (50)	

* Contact your local distributor for cooling system options and specifications based on your specific requirements.

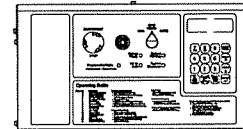
Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m ³ /min. (scfm)†	1161 (41000)	991 (35000)
High ambient radiator-cooled cooling air, m ³ /min. (scfm)†	1404 (49600)	—
Cooling air required for generator set when equipped with city water cooling or remote radiator, based on 14°C (25°F) rise, m ³ /min. (scfm)†	391 (13800)	340 (12000)
Combustion air, m ³ /min. (cfm)	87 (3072)	67 (2366)
Heat rejected to ambient air:		
Engine, kW (Btu/min.)	45 (2559)	50 (2843)
Alternator, kW (Btu/min.)	64 (3640)	45 (2560)

† Air density = 1.20 kg/m³ (0.075 lbm/ft³)

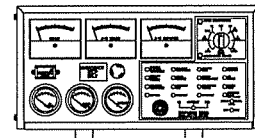
Fuel Consumption	60 Hz	50 Hz
Diesel, Lph (gph) at % load	Standby Rating	
100%	267.2 (70.6)	205.0 (54.2)
75%	202.4 (53.5)	153.7 (40.6)
50%	138.2 (36.5)	104.6 (27.6)
25%	75.7 (20.0)	57.6 (15.2)
Diesel, Lph (gph) at % load	Prime Rating	
100%	247.6 (65.4)	185.3 (49.0)
75%	189.3 (50.0)	139.7 (36.9)
50%	128.6 (33.9)	95.0 (25.1)
25%	71.5 (18.9)	53.0 (14.0)

Controllers



Decision-Maker™ 550 Controller

Audiovisual annunciation with NFPA 110 Level 1 capability. Programmable microprocessor logic and digital display features. Alternator safeguard circuit protection. 12- or 24-volt engine electrical system capability. Remote start, remote annunciation, and remote communication options. Refer to G6-46 for additional controller features and accessories.



Decision-Maker™ 3+, 16-Light Controller

Audiovisual annunciation with NFPA 110 Level 1 capability. Microprocessor logic, AC meters, and engine gauge features. 12- or 24-volt engine electrical system capability. Remote start, prime power, and remote annunciation options. Refer to G6-30 for additional controller features and accessories.

Standard Features and Accessories

Additional Standard Features

- Alternator Protection (standard with 550 controller)
- Oil Drain Extension
- Operation and Installation Literature
- Radiator Duct Flange

Accessories

Open Unit

- Exhaust Silencer, Critical, Kit: PA-354880
- Exhaust Silencer, Hospital, Kit: PA-354905
- Flexible Exhaust Connector, Stainless Steel
- Sound Enclosure (with roof-mounted hospital silencer)
- Weather Enclosure (with roof-mounted critical silencer)

Cooling System

- Block Heater
- High Ambient Radiator
- Remote Radiator Cooling

Fuel System

- Flexible Fuel Lines
- Fuel Filter
- Fuel Pressure Gauge
- Subbase Fuel Tank with Day Tank

Electrical System

- Battery
- Battery Charger, Equalize/Float Type
- Battery Heater
- Battery Rack and Cables

Engine and Alternator

- Air Cleaner, Heavy Duty
- Air Cleaner Restriction Indicator
- Bus Bar Kits (standard on 7M alternators, 380-600 volt only)
- Alternator Strip Heater
- Line Circuit Breaker (NEMA type 1 enclosure)
- Line Circuit Breaker with Shunt Trip (NEMA type 1 enclosure)
- NFPA 110 Literature
- Optional Alternators
- Rated Power Factor Testing
- Safeguard Breaker (not available with 550 controller)
- Integral Vibration Isolation Mounting
- Direct Mounting
- Spring Isolators

Paralleling System

- Load-Sharing Module
- Reactive Droop Compensator
- Remote Speed Adjust Control/Electronic Governor (550 controller only)
- Voltage Adjust Control
- Voltage Regulator Relocation Kit

Maintenance

- General Maintenance Literature Kit
- Maintenance Kit (includes air, oil, and fuel filters)
- Overhaul Literature Kit
- Production Literature Kit

Controller

- Common Failure Relay Kit
- Communication Products and PC Software (550 controller only)
- Customer Connection Kit
- Dry Contact Kit (isolated alarm)
- Prime Power Switch (550 controller only)
- Remote Annunciator Panel
- Remote Audiovisual Alarm Panel
- Remote Emergency Stop Kit
- Remote Mounting Cable
- Run Relay Kit

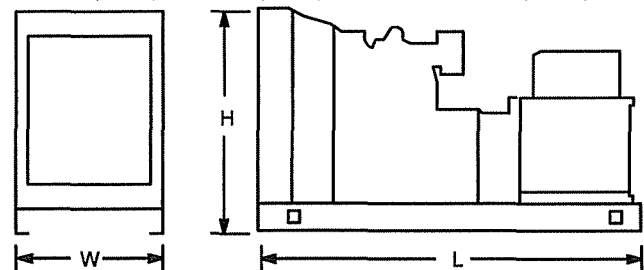
Miscellaneous Accessories

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Dimensions and Weights

Overall Size, max., L x W x H, mm (in.): 4863 x 1659 x 2326
(191.5 x 65.3 x 91.6)

Weight, radiator model, max. wet, kg (lb.):
 40°C (60 Hz) and 45°C (50 Hz) radiator 7200 (15873)
 45°C (60 Hz) and 50°C (50 Hz) radiator 7610 (16773)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

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ConVault Size	Weight (Empty)	Length	Width	Height
Gallons	Pounds	ft. & In.	ft. & In.	ft. & In.
125*	6,000	4' 0.5"	4' 0.5"	3' 11"
250	8,000	7' 8"	3' 9.5"	3' 3"
500	12,000	11' 0"	4' 6"	3' 4"
1,000	18,000	11' 0"	5' 8"	4' 4"
2,000	30,000	11' 3"	8' 0"	5' 6"
3,000 LP*	35,500 ⁺	11' 3"	8' 0"	7' 3.5"
4,000 LP*	45,000 ⁺	17' 7"	8' 0"	6' 5.25"
5,200 HP*	47,000 ⁺	15' 6"	8' 0"	8' 9"
6,000 HP	59,000 ⁺	17' 7"	8' 0"	8' 9.25"
8,000 HP	72,000 ⁺	23' 1"	8' 0"	8' 9.25"
10,000 HP	87,500 ⁺	28' 7"	8' 0"	8' 9.25"
12,000 HP	101,000 ⁺	34' 1"	8' 0"	8' 9.25"
Multi-Compartment Tank Sizes				
Double 125* (250 Split)	8,000	7' 8"	3' 9"	3' 3"
Double 250 (500 Split)	12,000	11' 0"	4' 6"	3' 4"
Double 500 (1000 Split)	18,000	11' 0"	5' 8"	4' 4"
Double 1,000 (2000 Split)	30,000	11' 3"	8' 0"	5' 6"
Double 1,500* (3000 Split)	35,500 ⁺	11' 3"	8' 0"	7' 3.5"
Double 2,000* (4000 Split)	45,000 ⁺	17' 7"	8' 0"	6' 5.25"
Double 2,600* (5200 Split)	47,000 ⁺	15' 6"	8' 0"	8' 9"
Double 3,000 (6000 Split)	59,000 ⁺	17' 7"	8' 0"	8' 9.25"
Double 4,000 (8000 Split)	72,000 ⁺	23' 1"	8' 0"	8' 9.25"
Double 5,000 (10,000 Split)	87,500 ⁺	28' 7"	8' 0"	8' 9.25"
Double 6,000 (12,000 Split)	101,000 ⁺	34' 1"	8' 0"	8' 9.25"
* This size is not available from all plants. †Unit weight will vary from plant to plant. Please check with your				



local representative for actual weight and availability.

Cylindrical (available only from Florida)

ConVault Size	Weight (Empty)	Length	Diameter
Gallons	Pounds	ft. & In.	ft. & In.
4,000 Cylindrical	46,000	11' 11"	9' 4.5"
5,200 Cylindrical	52,000	15' 1.5"	9' 4.5"
6,000 Cylindrical	60,000	17' 3"	9' 4.5"
8,000 Cylindrical	74,000	22' 7"	9' 4.5"
10,000 Cylindrical	80,000**	27' 11"	9' 4.5"
12,000 Cylindrical	93,000**	33' 3"	9' 4.5"

** If lightweight Concrete is used.

Metric Sizes (only available outside North America)

ConVault Size	Weight (Empty)	Length	Width	Height
Liters	kg	mm	mm	mm
1 000	4 000	2 350	1 150	1 100
2 000	6 000	3 300	1 450	1 100
4 000	9 000	3 300	1 750	1 450
6 000	12 000	3 400	2 400	1 500
8 000	13 500	3 400	2 400	1 800
12 000	18 000	4 900	2 400	1 800
16 000 LP	22 000	5 800	2 400	1 950
16 000 HP	20 000	4 050	2 400	2 650
20 000 LP	21 000	7 150	2 400	1 950
20 000 HP	24 000	4 950	2 400	2 650
22 000	25 000	5 400	2 400	2 650
25 000	28 000	6 100	2 400	2 650
30 000	34 000	7 250	2 400	2 650
35 000	41 000	9 100	2 400	2 650
45 000	46 000	10 700	2 400	2 650

* This size is not available from all plants. Please check with your local representative for availability.

The Cylindrical shape is available **only** from the Florida plant.

These are representative sizes and dimensions only. **Most units are also available as split units** in several multi-compartment configurations. Unit weight will vary from plant to plant. Also, some plants have additional size and dimension options that are not listed here. To prevent installation problems, and optimize your fuel storage site, please check with your local representative before specifying, or beginning site development.



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A. The Background

1. You are probably aware that underground fuel storage tanks are a main source of soil contamination in this country. Underground fuel storage tanks corrode and leak fuel oil and gas into the soil and cause soil contamination. The contamination may even reach the underground water streams and be carried into the drinking water systems. Decontamination of the underground fuel storage tanks' location is extremely costly and can have a devastating financial burden on tanks' owners and operators.
2. Regulatory agencies have enacted many guidelines requiring the owners and operators of the underground fuel storage tanks to install expensive leak detection and monitoring facilities to prevent costly contamination problems.
3. There are also many regulations covering installation and operation of "unprotected" above ground steel storage tanks.
4. To solve the problems associated with the underground storage tanks and the unprotected aboveground steel storage tanks, ConVault® has come up with a breakthrough idea of

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constructing a tank that does not have the costly underground tank's leak monitoring system and contamination problem and at the same time has overcome the problems associated with the unprotected aboveground steel tanks. Because of its unique monolithic concrete construction feature, the ConVault® tank system provides a two (2) hour fire protection, vehicle impact resistance and bullets resistance proven by the tests carried out by the Underwriters Laboratories of USA (UL) and Canada (ULC).

B. Engineered for safety

1. The design and manufacturing concept of the ConVault® is simple and at the same time very practical. In a nut-shell, ConVault's® design concept consists of :
 - a. Constructing a welded steel tank to hold and store flammable and combustible liquid fuels.
 - b. Insulating the steel tank exterior by a minimum of 1/4" thick Styrofoam and wrapping it in a 30 mil high density polyethylene membrane to provide a secondary containment for fuel in case of a remote probability of any leaks from the steel tank.
 - c. Encasing both the poly and the steel tank in 6" thick monolithic reinforced concrete vault to provide two-hour fire protection, ballistic and vehicle impact protection.
2. ConVault® has even designed a leak detection system that enables checking the tank for leaks on a regular basis by simply inserting a stick in the leak detector chamber and find out if the tank has any leaks.
3. ConVault® is so confident of its superior design that it gives 20 to 30 years of warranty for its tanks. Provided that the tank is installed, operated and maintained in accordance with ConVault's® specifications, ConVault® will replace your tank without charge if it develops a leak. See your standard warranty for its actual number of years and its conditions.
4. Since you have purchased one of over 18,000 tanks, which remain in service since 1987, you may wish to understand the unique manufacturing process of ConVault tanks. The following paragraphs will explain the construction process of the ConVault® tanks.

C. The Manufacturing Process

ConVault® tanks construction process consists of four main steps, namely:

1. Steel tank construction
2. Secondary containment
3. Concrete Vault
4. Coating and Finishing

Figure No. 1 is an isometric view of a typical ConVault® tank with a cutaway section to show details of a ConVault® tank system.

1. Steel tank construction

a. ConVault® steel tanks are made of 1/8" or 3/16" thick steel, depending on warranty and tank size. The steel tank contains and holds the liquid fuel, which is the primary function of the tank. To make the steel tank systems fit for their function; the tanks are made in accordance with the UL standard 142 and ULC standard S601. The UL/ULC standards cover all the aspects of tank construction including material specification, fabrication, welding and testing. The tanks are listed in accordance with UL/ULC Standards and carry UL/ULC labels as such.

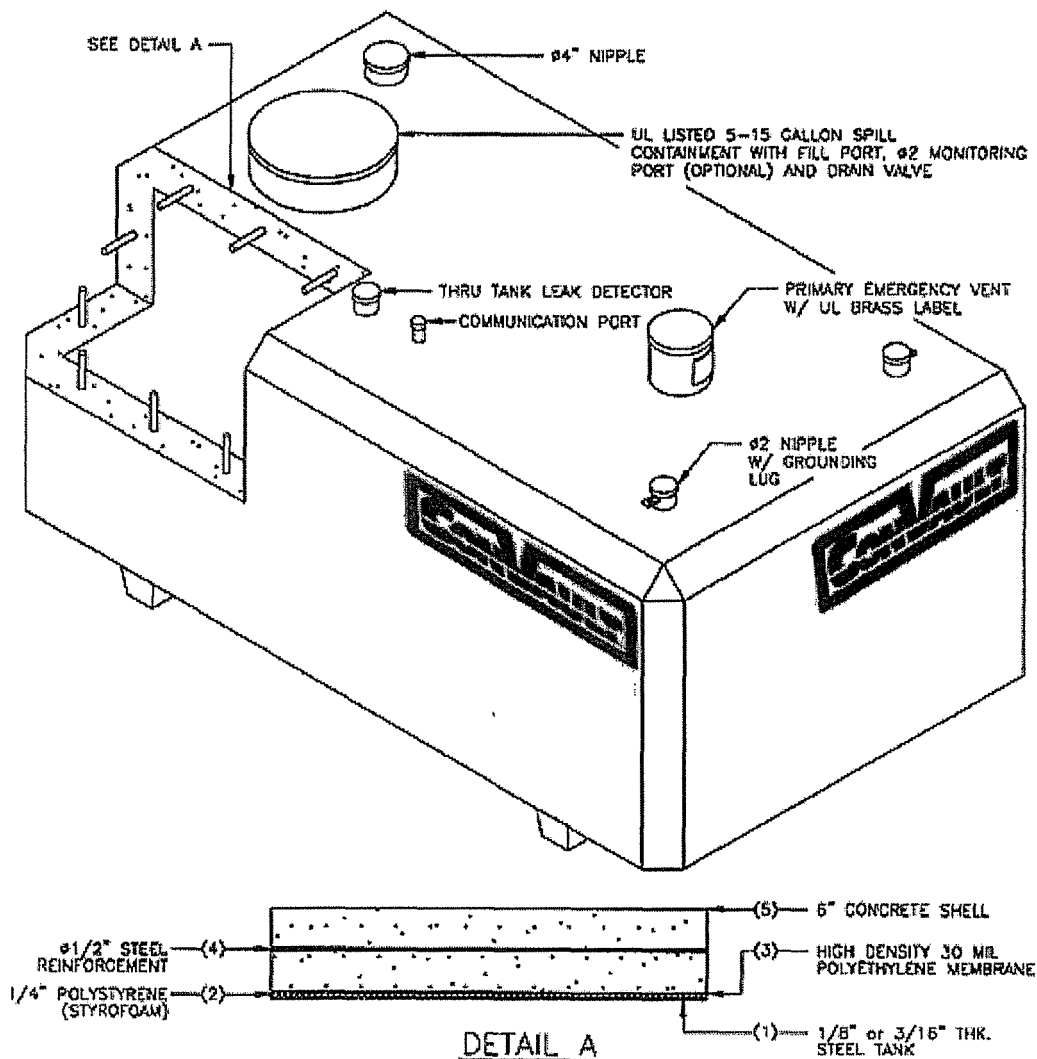
b. At the fabrication shop, the tanks undergo a number of quality control and test procedures including a 24 to 48 hour pressure test at five (5) psig.

2. Secondary Containment

a. The second stage of manufacturing consists of wrapping the steel tank with a minimum of 1/4" thick Styrofoam (foam) insulation and an impervious barrier of 30 Mil high density polyethylene membrane (poly). The 30 Mil poly provides containment for the remote probability of fuel leak through the steel tank. A leak detector pipe terminating in the secondary containment provides a positive-proof that the tank is not leaking.

b. Another advantage of the 30 Mil poly is that it shields and protects the steel tank exterior from coming in direct contact with concrete and thus minimizing the potential of tank external corrosion.

Figure No. 1



3. The Concrete Vault

The next step of manufacturing a ConVault® tank is to encase the tank in a six (6) inch thick reinforced concrete vault. Simply put, the six inches of concrete is poured on all sides bottom and top of the tank in one step and hence the phrase "monolithic". This

process assures that there are no joints and no heat sinks in the concrete to carry heat from a fire into the primary containment.

The concrete pouring process also goes through a strenuous quality control procedure to make sure the ConVault® tank withstands its ultimate performance test, the two (2) hour fire test. ConVault® tanks are listed by UL 2085 standard and ULC/ORD 142.16 as fire resistant/insulated and protected tank.

4. Coating and Finishing

At the final stages of manufacturing, the concrete exterior of the tank is vacuum coated using a two-part water based epoxy paint to protect the tanks from the inclement weather conditions. Concrete exterior can also be produced in exposed aggregate with a clear coat of sealant or in STO finish. The entire pipe fittings and nipples on the tank are powder-coated to protect them from corrosion.

D. Additional features

The following is a list of some of the major features and advantages of the ConVault® tanks:

1. Complying with Environmental and Fire Safety Requirements

- a. ConVault® tanks meet applicable safety requirements for secondary containment, leak monitoring, and spill protection. ConVault® tanks are approved by fire officials in most local jurisdictions. They are currently in use nationwide.
- b. ConVault® tanks meet NFPA 30 and 30A , UFC, BOCA, SBCCI model fire codes safety standards. The units comply with the 1996 Uniform Fire Code Standard for the aboveground storage and dispensing of motor fuels.
- c. ConVault® tanks are certified by the California Air Resources Board for Balanced Phase 1 and phase 2 Vapor Recovery including methanol and ethanol.

2. UL/ULC Listed

- a. The ConVault® tanks have the following UL and ULC listings:
 1. **UL - 142**, aboveground tanks for flammable and combustible liquids.
 2. **UL - 2085**, two hour furnace fire test and two hour simulated pool fire test for insulated tank.
 3. **UL - 2085**, insulated and protected secondary containment aboveground tanks for flammable and combustible liquids
 4. **UL - 2085 and UFC SECTION (79-7)** ballistic and vehicle impact test for protected tank.
 5. **UL – 2085/UL CAN ORD-C 142.16** Non-Metallic Secondary Containment and Venting by Form of Construction.
 6. **UL – Subject 2244** Systems Listing for Motor Vehicle Fuel Dispensing.
 7. **UL CAN/ORD - C 142.16**, protected aboveground tank assemblies for flammable and combustible liquids.
 8. **UL CAN/ORD - C 142.5**, concrete encased aboveground tank

assemblies for flammable and combustible liquids.

9. **UL CAN/ORD - 142.16**, the furnace burn requirements for two hour fire rating.
10. **UL CAN/ORD - 142.5**, the open (pool) fire testing for two hour flammable liquid fire test.

3. Overfill Protection

Tanks can be provided with two or more of the following methods to protect them against overfill: a) direct reading level gauge at the tank which is visible from fill pipe location; b) valve located within fill-pipe access to close automatically at a specified fill level; c) audible high level alarm activated by a float switch at a specified fill level.

4. Venting

The ConVault® tank systems are furnished with a 2 inch normal vent and an emergency pressure relief system. The standard emergency relief system furnished with the tank normally opens if the tank pressure exceeds 1/2 psig. The tank systems conform to model fire codes and UL/ULC Standards for venting.

5. Support Legs

Vaults have concrete support legs of unitized monolithic construction that provide visual inspection capability. Tanks do not require cathodic protection system as no steel part of the tanks comes in direct contact with the ground.

6. Thermal and Corrosion Protection

The tank construction includes thermal insulation to protect against temperature extremes and corrosion by separating the steel tank from the concrete. No part of the steel tank comes in direct contact with concrete or any other corrosive material.

7. Spill Containment

The tank system includes a 5 to 15 gallon, powder-coated UL-Listed and patented, spill containment surrounding the fill pipe. The spill container is equipped with a normally closed hand operated valve that can be actuated to drain the spilled fuel liquids into the steel tank.

8. Vehicle impact resistance

ConVault® tanks are designed to have a low center of gravity that can withstand vehicle impact and tipping during earthquakes and other natural disasters. ConVault® tanks have withstood even phenomenon tests such as C-130 aircraft impact at Ft. Dobbins in Georgia, Hurricane Andrew and the 1989 Loma Prieta earthquake.

9. Bullet Resistance

ConVault® tanks withstand bullet resistance tests in compliance with UFC SECTION (79-7). APPENDIX # A-II-F-1.

10. Non-Metallic Secondary Containment and Venting by Form of Construction.

The UL 2085 Standard listing officially recognizes ConVault tank as having a secondary containment that is non-metallic and that vents by form of construction. This eliminates the need for an emergency-venting device on the secondary containment.

11. California Air Resources Board (CARB) Certified

ConVault AST's are CARB certified for use with Phase I and Phase II vapor recovery systems under Executive Order G-70-116 and revisions A through F. California is recognized as the national air quality expert and, having passed all field examinations by CARB, ConVault AST's are generally regarded as having met the severest air quality compliance standards.

More information can be found at their website: <http://www.arb.ca.gov>.

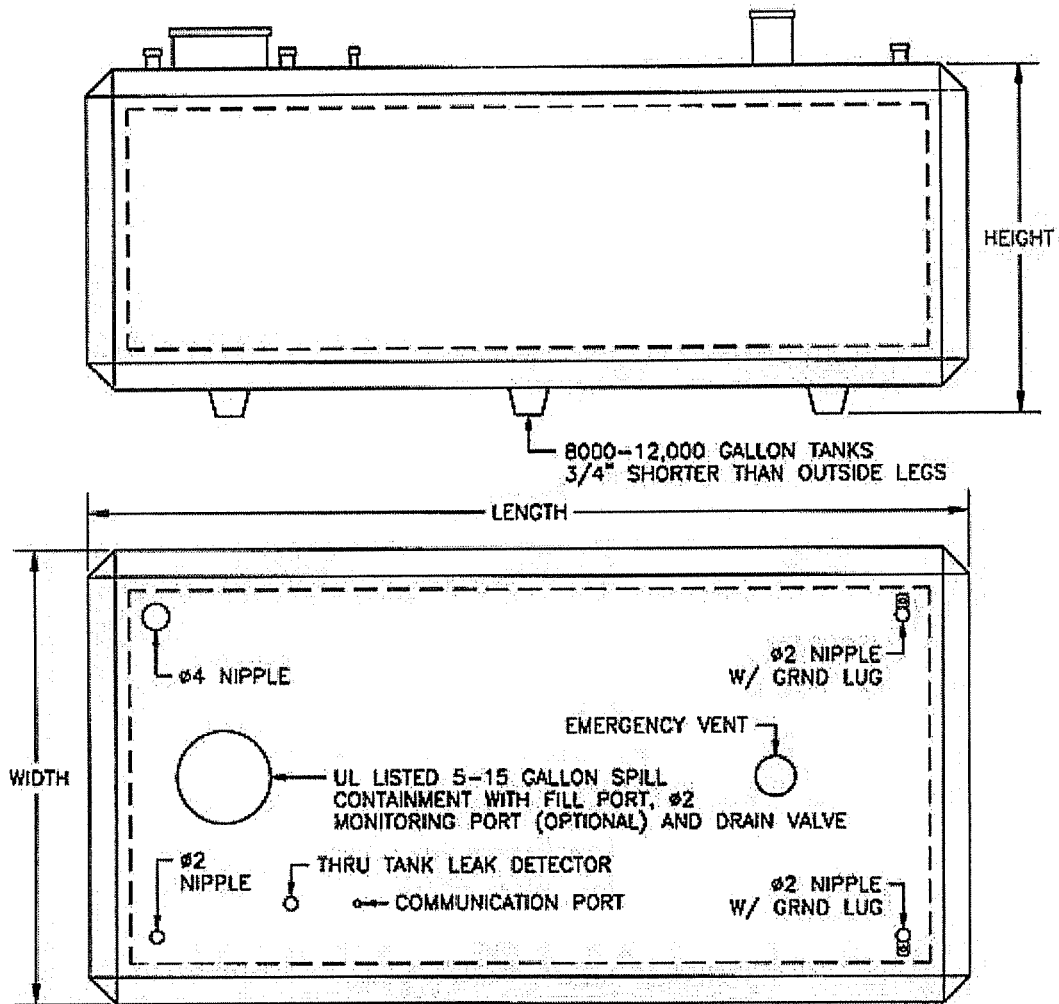
- **.NOTICE: Aboveground Storage Tanks (AST) should be evaluated to determine acceptability for continued use after fire exposure, physical damage, or misuse.**

E. Tanks' Weights and Dimensions

Figures No. 2, 3 and 4 give nominal capacities, the outside dimensions, general fittings layout and approximate weights of some popular ConVault® systems. These figures can help you in your planning for the future fuel storage requirements. Contact your ConVault® distributor for accurate weight of tanks to help you in arranging for proper equipment for unloading and setting of tanks.

Figure No. 2

**Tank Weights and Dimensions *
Single Primary Tank**



SIZE	LENGTH	WIDTH	HEIGHT	WEIGHT
125	4' - 1"	4' - 1"	3' - 11"	6,000
250	7' - 8"	3' - 9"	3' - 3"	8,000
500	11' - 0"	4' - 6"	3' - 4"	12,000
1000	11' - 0"	5' - 8"	4' - 4"	18,000
2000	11' - 3"	8' - 0"	5' - 6"	30,000
3000 LP	11' - 3"	8' - 0"	7' - 3"	35,500
4000 LP	17' - 7"	8' - 0"	6' - 5"	45,000
5200 G	15' - 6"	8' - 0"	8' - 9"	47,000
6000	17' - 7"	8' - 0"	8' - 9"	59,000

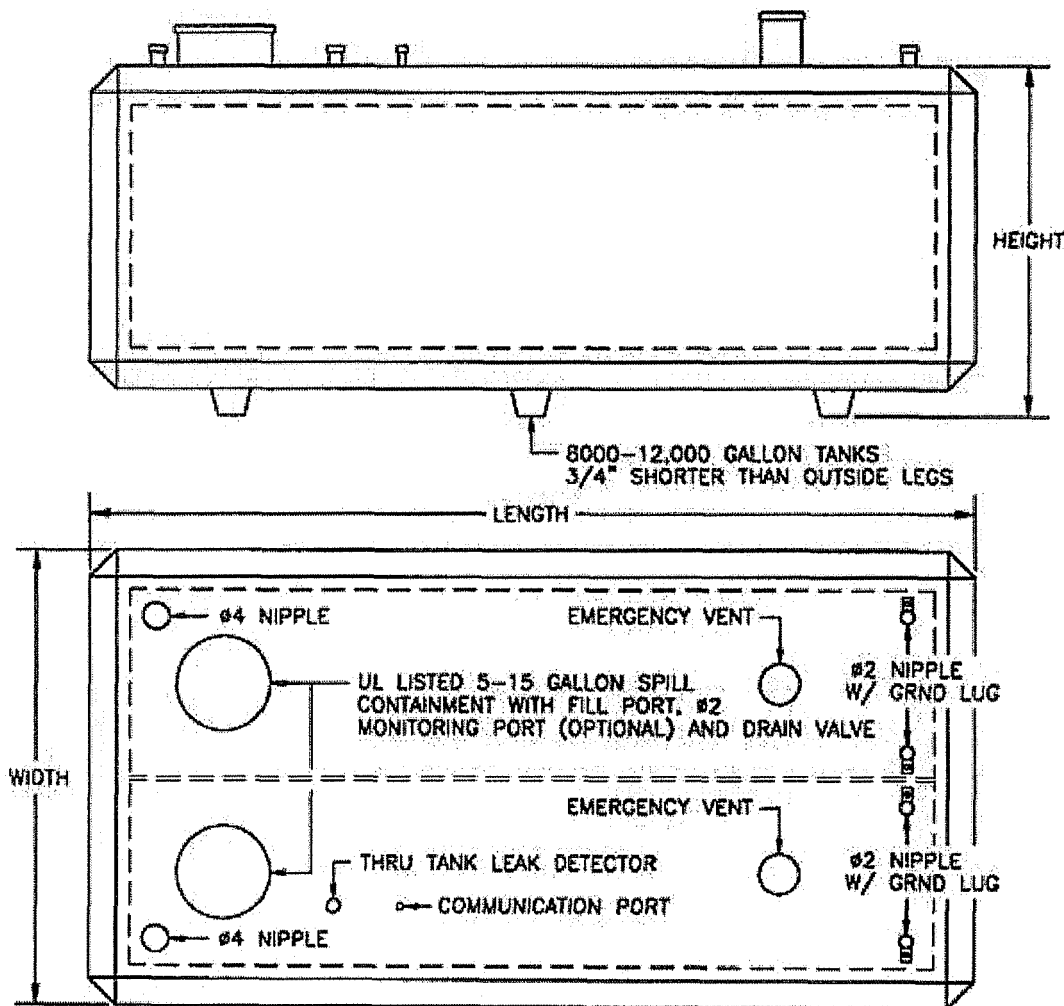
8000	23' - 1"	8' - 0"	8' - 9"	72,000
10000	28' - 7"	8' - 0"	8' - 9"	87,500
12000	34' - 1"	8' - 0"	8' - 9"	101,000

- Double-wall steel tanks are optional and external dimensions are identical to single wall tank.
- Nipple layout and designs vary according to customer needs.

***NOTE:** These are nominal weights of the tanks. Check with your distributor/salesperson for accurate weights.

Figure No. 3

Multi-Compartment Tank Weights and Dimensions *
The "D" Design



SIZE	LENGTH	WIDTH	HEIGHT	WEIGHT

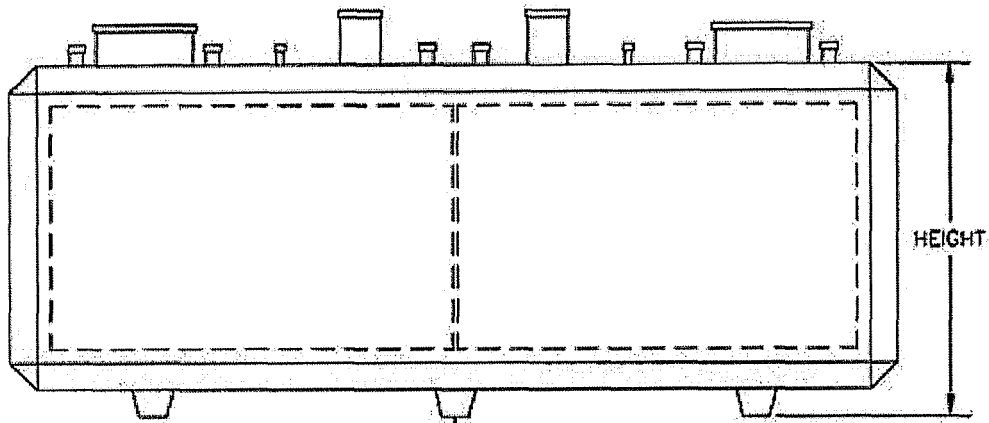
D250	11' - 0"	4' - 6"	3' - 4"	12,000
D500	11' - 0"	5' - 8"	4' - 4"	15,500
D1000	11' - 3"	8' - 0"	5' - 6"	30,000
D1500 LP	11' - 3"	8' - 0"	7' - 3"	30,000
D2000 LP	17' - 7"	8' - 0"	6' - 5"	45,500
D2,600 G	15' - 6"	8' - 0"	8' - 9"	47,000
D3000	17' - 7"	8' - 0"	8' - 9"	59,000
D4000	23' - 1"	8' - 0"	8' - 9"	72,000
D5000	28' - 7"	8' - 0"	8' - 9"	87,500
D6000	34' - 1"	8' - 0"	8' - 9"	101,000

- Nipple layout and design vary according to customer needs.

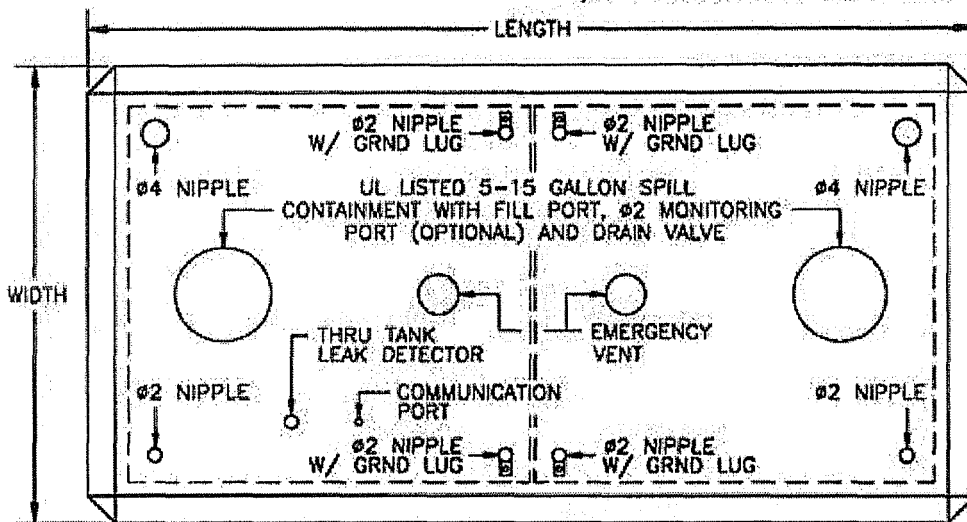
***NOTE:** These are nominal weights of the tanks. Check with your distributor/salesperson for accurate weights.

Figure No. 4

Multi-Compartment Tank Weights and Dimensions *
The "E" Design



8000-12,000 GALLON TANKS
3/4" SHORTER THAN OUTSIDE LEGS



SIZE	LENGTH	WIDTH	HEIGHT	WEIGHT
E250	11' - 0"	4' - 6"	3' - 4"	12,000
E500	11' - 0"	5' - 8"	4' - 4"	18,000
E1000	11' - 3"	8' - 0"	5' - 6"	30,000
E1500 LP	11' - 3"	8' - 0"	7' - 3"	35,500
E2000 LP	17' - 7"	8' - 0"	6' - 5"	45,000
E2600 G	15' - 6"	8' - 0"	8' - 9"	47,000
E3000	17' - 7"	8' - 0"	8' - 9"	59,000
E4000	23' - 1"	8' - 0"	8' - 9"	72,000
E5000	28' - 7"	8' - 0"	8' - 9"	87,500
E6000	34' - 1"	8' - 0"	8' - 9"	101,000

- Nipple layout and design vary according to customer needs.

***NOTE:** These are nominal weights of the tanks. Check with your distributor/salesperson for accurate tank weight.

F. Permits and Approvals

Installation of fuel/oil storage systems requires approval process from various government agencies. Table 1 shows typical approval process and documents needed. Specific local or AUTHORITIES HAVING JURISDICTION requirements may slightly differ for different locations, but the list is a good reference and a guide for your permits requirements.

Table 1

PERMITS AND APPROVALS

A.	State and/or local application forms	F.	Prepare system detailed drawings to include:
B.	The ConVault® Site Review Form approved by the local Fire Marshall.	1.	Tank size, dimensions, and spacing between adjacent tanks.
C.	Site plan drawings.	2.	Base slab dimensions and bollard location and size.
D.	System detail drawings.	3.	Vent size and location. Height of standard vent and type of cap.
E.	Prepare the site plan as follows:	4.	Fill details including spill and overfill protection.
1.	Draw to scale.	5.	Piping details including shutoff valves and anti-siphon valves.
2.	Show property lines and indicate occupancy or use of adjacent property.	6.	Pumps and dispensing equipment including location, size, and type.
3.	Show streets, intersections, and railroads.	7.	Electrical details including shutoff switch location and grounding wire.
4.	Show buildings on the site and indicate type of construction. Show building openings on walls adjacent to tanks.	8.	Level gauges and leak detection equipment
5.	Show important utility lines, sewer, water, gas, and electric including fire hydrants and catch basins.	9.	Signs and decals.

6.	Show any nearby waterways streams, rivers, lakes, or retention basins.		
7.	Show any underground or aboveground tanks.		
8.	Show new tank location and indicate shortest distance to buildings and property lines.		

- **NOTICE:** It is advisable for the owners/operators to become familiar with the codes and regulations applicable to their operation. Table 2 lists some of the codes and regulations governing aboveground storage tanks.

Table No. 2

CODES, REGULATIONS, AND GUIDELINES

Aboveground fuel storage tanks fall under a variety of governmental jurisdictions; therefore the following reference is provided as a general outline. You may be subject to different legislation and governing bodies in your specific locale. A preliminary investigation must be conducted to thoroughly understand the controlling factors prior to the utilizing the product in your specific area.

FEDERAL REGULATIONS

40 CFR 112

US Coast Guard

Environmental Protection Agency (EPA)

Occupational Safety and Health Administration (OSHA)

STATE REGULATIONS

Federal regulations are referred to the governor of each state with the instructions that delegated duties to subordinate state agencies must provide a written plan on how the individual state will comply with the EPA's enforcement activities.

CODES AND STANDARDS

NFPA 30, 30A, and 31 Flammable and Combustible Liquid Code

ICBO Uniform Fire Code section 79 APPENDIX A - II - F (UFC)

Building Officials and Code Administration (BOCA)

Underwriters Laboratories (UL)

Underwriter's Laboratories Canada (UL CAN/ORD)

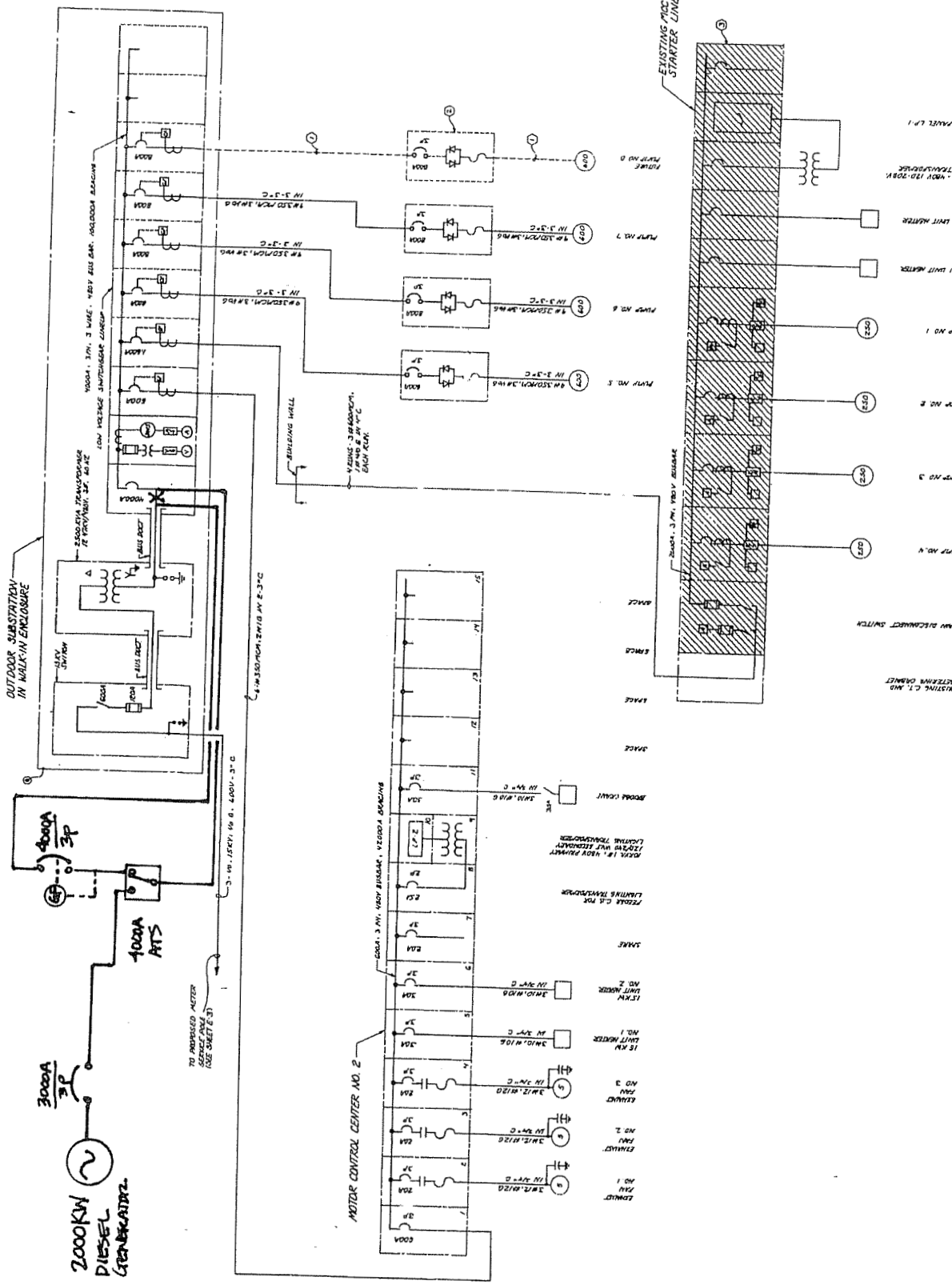
Southern Building Code Congress Institute (SBCCI)

ENVIRONMENTAL CAVEAT

Several regulatory agencies have been integrally involved in the development of the ConVault® aboveground storage tanks.

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- NOTES:**
- 1 CONTRACTOR TO PROVIDE 3" CONCRETE DUCT FOR PUMPING RIG.
 - 2 PROVIDE SPACE FOR FUTURE ADDITION OF PUMPS.
 - 3 SHARED SPACE OF EXISTING PUMP AND STARTER LINEUP OF 480V-3-P, 3-W, 3-Ø BUS. CHECK THE CLEARANCE OF THIS WORK.



ONE LINE DIAGRAM MODIFICATIONS

ELECTRICAL
SINGLE LINE POWER DIAGRAM

DATE: MAY 1987

APPROVED BY: [Signature]

CHECKED BY: [Signature]

DRAWN BY: [Signature]

DESIGNED BY: [Signature]

REVISIONS:

NO.	DATE	BY	CHKD.

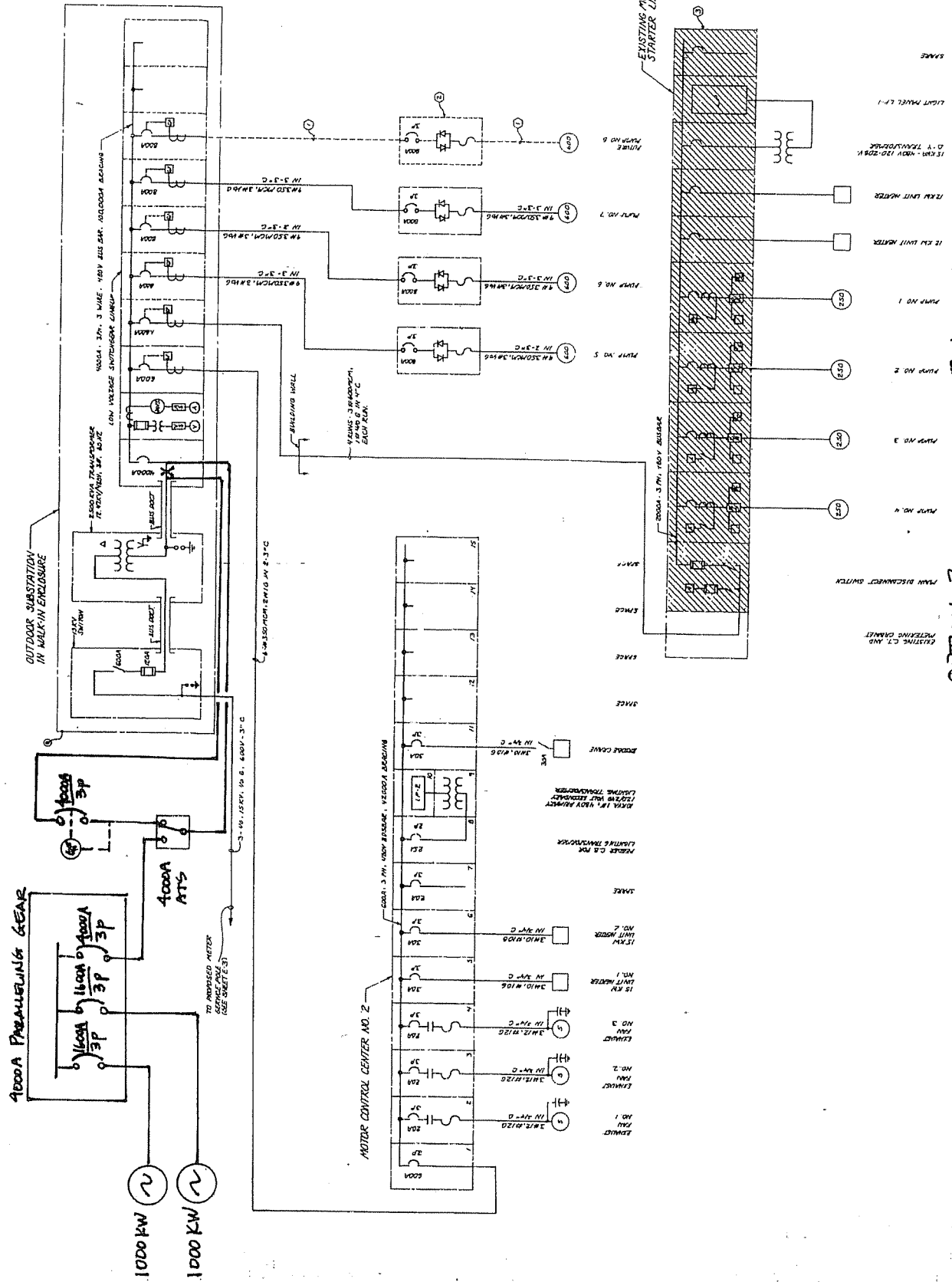
OPTIONS 1 & 2

KENTON COUNTY WATER DISTRICT NO. 1
DUDLEY ROAD PUMP STATION EXPANSION

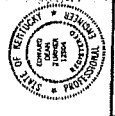
Burgess & Niple, Limited
Engineers and Architects

1000 GRIFFIN DRIVE, CHATTANOOGA, TENNESSEE 37403
MEMPHIS, TENNESSEE
NASHVILLE, TENNESSEE
PITTSBURGH, PENNSYLVANIA
PHOENIX, ARIZONA

NO.	REVISIONS	DATE	BY	CHKD.



- NOTES:
- CONFORM TO REQUIRE 3-3- CONDUITS ONLY FOR ABOVE USE.
 - REMOVE SPACE FOR FUTURE ADDITION OF STARTER.
 - SHARED AREA OF EXISTING PANEL AND STARTER LINEUP. ALL WORK SHALL BE DONE IN THIS AREA.



OPTION 3

ONE LINE DIAGRAM MODIFICATIONS

ELECTRICAL

SINGLE LINE POWER DIAGRAM

KENTON COUNTY WATER DISTRICT NO. 1

DUDLEY ROAD PUMP STATION EXPANSION

Burgess & Niple, Limited
 Engineers and Architects

1011 - Campbell St., Louisville 11, Kentucky
 1000 - Lexington St., Lexington 11, Kentucky

NO.	REVISION	DATE	BY	CHK.

JOB NO.	4013
DESIGNED BY:	BOB
DRAWN BY:	KJM
CHECKED BY:	BOB
APPROVED BY:	BOB
DATE:	MAY 1957

REAR:	NONE
SHEET NO.	E2
OF	7

Case No. 2006-_____
Exhibit A

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

Engineer's Opinion of Probable Total Construction Cost

Case No. 2006-____
Exhibit A

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

Plans and specifications prepared by GRW Engineers
titled "Dudley Pump Station Generator"

Submitted as separate attachments

Northern Kentucky Water District

The following items are enclosed separately from this volume.

- Plans prepared by GRW Engineers titled “Dudley Pump Station Generator” dated October, 2006. (5 sets)
- Specifications prepared by GRW Engineers titled “Dudley Pump Station Generator” dated October, 2006. (5 sets)

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

CERTIFIED STATEMENTS

Affidavit

Franchises

Plan Review and Permit Status

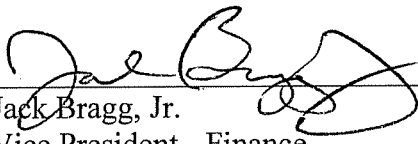
Easements and Right-of-Way Status

Construction Dates and Proposed Date In Service

Plant Retirements


**AFFIDAVIT
Dudley Pump Station Generator**

Affiant, Jack Bragg, Jr., being the first duly sworn, deposes and says that he is the Vice President of Finance of the Northern Kentucky Water District, which he is the Applicant in the proceeding styled above; that he has read the foregoing "Dudley Pump Station Generator" Application and knows the contents thereof, and that the same is true of his own knowledge, except as to matters which are therein stated on information or belief, and that is to those matters he believes them to be true.



Jack Bragg, Jr.
Vice President - Finance
Northern Ky. Water District

Subscribed and sworn to before me in said County to be his act and deed by Jack Bragg, Jr., Vice President of Finance of the Northern Kentucky Water District, this 29th day of November 2006.



NOTARY PUBLIC
Campbell County, Kentucky
My commission expires May 13, 2007

Northern Kentucky Water District

Franchises required – None

Plan Review and Permit Status - The District has reviewed and approved the plans and specifications prepared by GRW Engineers titled “Dudley Pump Station” dated October, 2006.

Approval from the Division of Water is not required.

Easements and Right-of-Way Status - Easement and Right-of-Way statements are not required.

Start date of construction – assumed February, 2007

Proposed date in service – assumed December, 2007

Plant retirements – None

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

BID INFORMATION AND BOARD RESOLUTION

Bid Tabulation

Engineer's Recommendation of Award

Board Resolution

ITEMS CONCERNING BID INFORMATION AND BOARD RESOLUTION

- The Bid opening was October 31, 2006 and the bid tabulation is attached. The project includes construction of a two new 1000 KW parallel standby generators with sub-base fuel tanks and sound attenuated enclosures at the existing Dudley Pump Station. The standby generators will be paid from the District's BAN 2007, PSC No. 84 "Dudley Pump Station Generator" with a budget of \$1,500,000, which includes construction cost, engineering, and contingencies. A summary of the project costs is provided below:

o Design Engineering	\$ 31,000
o Construction Engineering	\$ 16,000
o Contractor's Bid	\$ 1,074,000
o Misc. & Contingencies	\$ <u>379,000</u>
Total Project Cost	\$ 1,500,000

The total project cost of \$1.5 million will fall under Uniform System of Accounts Code 310 Power Generation Equipment.

Total Dudley Pump Station Generator Project **\$1,500,000 financed through 2007 BAN**

- The Engineer's Recommendation of Award is attached.
- The Board Resolution from the November 16, 2006 meeting is attached.

Case No. 2006-_____
Exhibit _____ C _____

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

Bid Tabulation

BID TAB

Northern Kentucky Water District Dudley Pump Station Generator

October 31, 2006

<u>CONTRACTOR</u>	BID AMOUNT
DeBra-Kuempel	\$1,074,000.00
SECO Electric	\$1,085,000.00
Lake Erie Electric	\$1,190,000.00
United Electric Co.	\$1,190,000.00
T. J. Williams	\$1,192,525.00
Glenwood Electric	\$1,236,000.00
N. Ky. Electric Service	\$1,275,000.00

Case No. 2006-____
Exhibit ____ C

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

Engineer's Recommendation of Award



801 Corporate Drive
Lexington, KY 40503
Tel 859 / 223-3999
Fax 859 / 223-8917

GRW Engineers, Inc.

Engineering
Architecture
Planning
GIS
Aviation Consultants

Arlington, TX
Cincinnati, OH
Indianapolis, IN
Knoxville, TN
Louisville, KY
Nashville, TN

November 6, 2006

Ms. Amy Kramer, P.E.
Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018

RE: Award Recommendation
Dudley Pump Station Generator
Edgewood, Kentucky
GRW Project No. 3462

Dear Ms. Kramer:

As you are aware, the subject project bid on Tuesday, October 31, 2006, at 2:00 pm at NKWD offices on Crescent Springs Road. The apparent low bidder for the subject project was DeBra-Kuempel, located in Cincinnati, Ohio, with a bid amount of \$1,074,000. The bid was signed and appeared to be complete with all addenda acknowledged, bid bond included, and the non-collusion affidavit, materials and sub-contractors' lists, and questionnaire completed.

The questionnaire requested financial data for the company, and a 2005 annual report for Emcor, who is DeBra-Kuempel's parent company, was included. In 2005, Emcor had an annual gross revenue of \$4.7 billion, with 10.6% profit margin.

We also researched three of the listed references in the questionnaire. One of the references was a project with Heapy Engineering serving as the consultant. DeBra-Kuempel's role on that project was mechanical contractor. The project included what was described as a difficult change out of an air handling unit in Wilson Memorial Hospital. The work required the installation of temporary air handling facilities and critical switchover. The Engineer said the project was very successful in regard to the work performed by DeBra-Kuempel.

We also contacted Clear Channel/WKRC TV in Cincinnati. They have been using DeBra-Kuempel for electrical work for about 10 years. Most of the work has been during emergency conditions. Work has been related to lightning protection and electrical for communication equipment. They were very pleased with the work done by DeBra-Kuempel, and their ability to perform under difficult conditions. DeBra-Kuempel provided home telephone numbers to the client, and had a person designated to take emergency calls 24/7.

University of Cincinnati was also listed as a reference. DeBra-Kuempel completed a project on their campus which included the installation of synchronization gear for two paralleled generators. The generators served research facilities and other





Ms. Amy Kramer, P.E.
Northern Kentucky Water District
November 6, 2006
Page 2

campus buildings that could be down for only limited periods. Switchover was performed during nighttime hours. The project was successful, and the University was pleased with their work.

Based on our research, DeBra-Kuempel appears to have experience with similar projects, projects of equal size, and appears financially stable. Therefore, GRW recommends the Contract be awarded to DeBra-Kuempel. If NKWD is in agreement, we will await receipt of the signed agreement and other required documents from the Contractor, and proceed with assembly of Construction Documents.

If you have any questions, or need additional information, please do not hesitate to call.

Sincerely,

Michelle Howlett, P.E.
GRW Project Manager

Case No. 2006-____
Exhibit C

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

Board Resolution

**Northern Kentucky Water District
Board of Commissioners Meeting
November 16, 2006**

A regular meeting of the Board of Commissioners of the Northern Kentucky Water District was held on November 16, 2006 at the District's facility located at 2835 Crescent Springs Road in Erlanger, Kentucky. All Commissioners were present. Also present were Ron Lovan, Bari Joslyn, Richard Harrison, Mark Lofland, Jack Bragg, Bill Wulfeck, Don Gibson, Amy Kramer, Mary Carol Wagner, Jim Dierig, Frances Robinson, Bob Buhrlage, Connie Pangburn, Gary Long, Chris Gephart and Charles Pangburn.

Commissioner Koester called the meeting to order.

Ms. Kramer of the District staff led those in attendance in the Pledge of Allegiance.

Mr. Lovan of the District staff introduced Chris Gephart of the Leadership Northern Kentucky program to the Board.

Mr. Lovan and Mr. Bragg of the District staff delivered a brief presentation on commissioner training.

The Board reviewed articles published and correspondence received since the last regular Board meeting on October 19, 2006.

On motion of Commissioner Macke, seconded by Commissioner Sommerkamp, the Board unanimously approved the minutes for the regular Board meeting held on October 19, 2006.

On motion of Commissioner Collins, seconded by Commissioner Wagner, and after discussion, the Board unanimously approved the expenditures of the District for the month of October, 2006.

On motion of Commissioner Collins, seconded by Commissioner Sommerkamp, and after discussion, the Board unanimously agreed to award the contract for furnishing and delivering empty water bottles with labels and caps to Grimes Promotional Products, LLC and authorized the District staff to execute appropriate contract documents.

On motion of Commissioner Wagner, seconded by Commissioner Sommerkamp, and after discussion, the Board unanimously agreed to authorize the District staff to execute engineering contract documents with GRW Engineers, Inc. for engineering services for residuals handling at the Fort Thomas Treatment Plant.

On motion of Commissioner Wagner, seconded by Commissioner Jackson, and after discussion, the Board unanimously agreed to award the Dudley Pump Station Generator project to Debra Kuempel and to authorize the District staff to execute appropriate contract documents.

On motion of Commissioner Macke, seconded by Commissioner Collins, and after discussion, the Board unanimously agreed to award a contract for the purchase of ¾-inch copper service piping, 1 ½-inch copper service piping and 2-inch copper service piping to Florence Winnelson Company and to authorize the District staff to execute appropriate contract documents.

On motion of Commissioner Collins, seconded by Commissioner Wagner, and after discussion, the Board unanimously agreed to award the contract for auditing services for the years 2006, 2007 and 2008 to VonLehman & Company and to authorize the District staff to execute appropriate contract documents.

On motion of Commissioner Macke, seconded by Commissioner Collins, and after discussion, the Board unanimously agreed to approve the list of 2006 Commissioner Training in accordance with KRS 74.020.

On motion of Commissioner Wagner, seconded by Commissioner Collins, and after discussion, the Board unanimously agreed to authorize the purchase of the following vehicles from the vendors indicated:

¾ ton pick-up, extended cab 4x4	Country Side
¾ ton pick-up, extended cab 4x2	Country Side
Light dump truck with saddle box	Country Side
Compact extended cab pick-up, 4 door/4x4	Uebelhor & Sons
Compact extended cab pick-up, 4 door/4x2	Uebelhor & Sons
1,500 AWD cargo van	Uebelhor & Sons
1 ton cab/chassis with utility bed and air compressor	Woody Sander

On motion of Commissioner Sommerkamp, seconded by Commissioner Wagner, and after discussion, the Board unanimously agreed to authorize the District staff to execute engineering contract documents with Malcolm Pirnie for the Granular Activated Carbon preliminary design for the Fort Thomas, Taylor Mill and Memorial Parkway Treatment Plants.

Commissioner Jackson departed the meeting.

The Commissioners present reviewed the District's financial reports and Department reports.

On motion of Commissioner Collins, seconded by Commissioner Wagner, the Commissioners present unanimously agreed to cancel the regular Board meeting in December,

2006 and to establish the date, time and location of each regular monthly Board meeting in calendar year 2007 as the third Thursday of each month, commencing at 12:30 p.m., at the District's facility located at 2835 Crescent Springs Road in Erlanger, Kentucky.

Other matters of a general nature were discussed.

There being no further business to come before the Board, the meeting was adjourned.

CHAIR

SECRETARY

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

PROJECT FINANCE INFORMATION

Customers Added and Revenue Effect

Debt Issuance and Source of Debt

Additional Costs for Operating and Maintenance

Depreciation Cost and Debt Service After Construction

Northern Kentucky Water District

There will be zero new customers added and no revenue effect as a result of the Dudley Pump Station Generator Project. The generators will furnish standby power to operate two pumps at a time in each pump station (total of four pumps).

The amount of debt issuance and source is \$1,500,000 from future BAN 2007.

Additional operating and maintenance costs incurred for the Dudley Pump Station Generator Project are as follows:

Annual O&M

Operation	\$2,000
Labor	\$3,000
Maintenance	<u>\$25,000</u>
	\$30,000

Annual depreciation and debt service after construction are as follows:

Depreciation	\$60,000/year over 25 years
Debt Service	\$93,750/year

Case No. 2006-____
Exhibit E

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

PSC ANNUAL REPORT - 2005

Water Districts & Associations-Class A&B

Annual Report

Of

**Northern Kentucky Water District
2835 Crescent Springs Road
Erlanger, KY 41018**

To The

Public Service Commission

Of The

Commonwealth of Kentucky

**211 Sower Boulevard
P.O. Box 615
Frankfort, Kentucky 40602**

For the Calendar Year Ended December 31, 2005

CHECKLIST FOR THE ANNUAL REPORT
 FOR CLASS A AND B WATER DISTRICTS AND WATER ASSOCIATIONS
 TO BE COMPLETED AND RETURNED WITH THE ANNUAL REPORT

Page No.	Account No.	Page No.	Yes	No	If No, Explain Why
9	233	24	X		Total 233
9	234	24	X		Total 234
9	236	25	X		Beginning and Ending Balance 236
9	237	25	X		Total 237 Cols b & e
9	242	26	X		Total 242
9	251	20	X		Total 251
9	252	21	X		Beginning and Ending Balance 252
10	400	27	X		Total Water Operating Revenue Col e
10	401	28	X		Total 601-675, Col c
10	408.1 & 408.2	25	X		Total Taxes Accrued 408.10-408.20
11	427	25	X		Total Interest Accrued Col c
11	Net Income Before Contributions		X		
13	101	12	X		Balance Trans From Inc Col c
14	The analysis of water utility plant accounts completed	14	X		Total Water Plant Col f
15	The analysis of accumulated depreciation and amortization has been completed.		X		Cols c through k has been
20	186.1	26	X		Total 186.1 Col c
22	Schedule of Long-Term Debt		X		has been completed
23	Schedule of Bond Maturities		X		has been completed
27	Taxes collected (example: school tax, sales tax, franchise tax) excluded from Revenue and Expenses		X		have been
27	The analysis of water operating revenue		X		Cols c, d, and e has been completed.

Additional Information Required by Commission Orders

Provide any special information required by prior commission orders, as well as any narrative explanations necessary to fully explain the data. Examples of the types of Special information that may be required by commission orders include surcharge amounts collected, refunds issued, and unusual debt repayments.

Case No.	Date of Order	Item/Explanation	
96-234	8/26/1996	Merger of Campbell Co. Water District and Kenton Co. Water District No. 1. Effective date of Merger 1/1/97.	
97-330	9/2/1997	Defeasance of the former Campbell Co. KY Water District Bonds. Principal of the Issue	9,630,000
92-482	3/14/1992	Subdistrict A	
		a. Number of Customers as of 12/31/2003	433
		b. Total surcharge billed during 2003	66,918
		c. Accumulated surcharge billed.	1,012,473
		d. Remaining Debt service on debt which NKWD issued to finance facilities.	789,265
94-409	1/26/1995	Subdistrict B	
		a. Number of Customers as of 12/31/2003	262
		b. Total surcharge billed during 2003	62,154
		c. Accumulated surcharge billed.	524,278
		d. Remaining Debt service on debt which NKWD issued to finance facilities.	1,706,371
95-582	2/8/1996	Subdistrict R	
		a. Number of Customers as of 12/31/2003	232
		b. Total surcharge billed during 2003	51,391
		c. Accumulated surcharge billed.	390,284
		d. Remaining Debt service on debt which NKWD issued to finance facilities.	1,091,016
95-582	2/8/1996	Subdistrict RL	
		a. Number of Customers as of 12/31/2003	86
		b. Total surcharge billed during 2003	38,695
		c. Accumulated surcharge billed.	313,969
		d. Remaining Debt service on debt which NKWD issued to finance facilities.	755,488

Major Water Projects

Instructions: Provide details about each major water project which is planned but has not yet been submitted for approval to the Public Service Commission. For the limited purpose of this report a "Major Project" is defined as one which is not in the ordinary course of business, and which will increase your current utility plant by at least 20%.

Brief Project Description (improvement, replacement, building construction, expansion. If expansion, provide the estimated number of new customers):

N/A

Projected Costs and Funding Sources/Amounts:

Approval Status: (Application for financial assistance filed, but not approved; or application approved, but have not advertised for construction bids)

Location: (community, area or nearby roads)

HISTORY

1. Exact name of utility making this report. (Use the words: "The, Company, Incorporated or Incorporated" only when a part of the corporate name.)

Northern Kentucky Water District

2. Give location including city, street and number, of the executive office:
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018
-

3. Give name, title, address, and telephone number of the officer to whom correspondence concerning this report should be addressed:

Jack Bragg, Jr.
P.O. Box 18640, Erlanger, Kentucky 41018

4. Date of organization: **January 1, 1997**
5. If a consolidated or merger company, name all contingent and all merged companies. Give reference to charters or general laws governing each and all amendments of same:

N/A

6. Date and authority for each consolidation and each merger:

N/A

7. State whether respondent is a corporation, a joint stock association, a firm or partnership or an individual:

Non-profit water utility
Special District – State of Kentucky

COMPARATIVE BALANCE SHEET - ASSETS AND OTHER DEBITS (CONT'D)

Account No. (a)	Account Name (b)	Ref. Page c	Previous Year (d)	Current Year (e)
DEFERRED DEBITS				
181	Unamortized Debt Discount & Expense	20	\$ 3,045,263	\$ 2,956,387
182	Extraordinary Property losses	21		
183	Preliminary Survey & Investagation Charges			
184	Clearing Accounts			
185	Temporary Facilities			
186	Misc. Deferred Debits	20	5,216,390	6,924,182
187	Research & Development Expenditures			
	Total Deferred Debits		\$ 8,261,653	\$ 9,880,569
	TOTAL ASSETS AND OTHER DEBITS		\$ 267,365,378	\$ 288,777,167

COMPARATIVE OPERATING STATEMENT

Acct. No. (a)	Account Name (b)	Ref. Page c	Previous Year (d)	Current Year (e)
Utility Operating Income				
400	Operating Revenues	27	\$ 32,185,250	\$ 34,846,622
401	Operating Expenses	28	\$ 19,429,652	\$ 20,479,276
403	Depreciation Expenses		5,128,169	5,361,019
406	Amortization of Utility Plant			
	Acquisition Adjustment		201,120	201,120
407	Amortization Expense		378,960	378,960
408.1	Taxes Other Than Income	25	519,707	544,011
	Utility Operating Expenses		\$ 25,657,608	\$ 26,964,386
	Utility Operating Income		\$ 6,527,642	7,882,236
413	Income From Utility Plant Leased to Others			
414	Gains (Losses) From Disposition of Utility Property		-	(7,249)
	Total Utility Operating Income		\$ 6,527,642	\$ 7,874,987
Other Income and Deductions				
415	Revenues From Merchandising, Jobbing and Contract Deductions		\$	\$
416	Costs and Expenses of Merchandising, Jobbing and Contract Work			
419	Interest & Dividend Income		791,405	1,862,615
420	Allowance for Funds Used During Constructon			
421	Nonutility Income		31,138	12,681
426	Miscellaneous Nonutility Expense			
	Total Other Income & Deductions		\$ 822,543	1,875,296
TAXES APPLICABLE TO OTHER INCOME				
408.2	Taxes Other Than Income		\$	\$
	Total Taxes Applic. To Other Income		\$	\$

COMPARATIVE OPERATING STATEMENT - Continued

Account No. (a)	Account Name (b)	Ref. Page ©	Previous Year (d)	Current Year (e)
INTEREST EXPENSE				
427	Interest Expense		\$ 5,344,406	\$ 6,126,890
428	Amortization of Debt Discount & Exp.		150,663	202,582
429	Amortization of Premiun on Debt		4,928	4,928
	Total Interest Expense		\$ 5,490,141	\$ 6,324,544
EXTRAORDINARY ITEMS				
433	Extraordinary Income		\$	\$
434	Extraordinary Deductions			
	Total Extraordinary Items		\$ -	\$ -
	NET INCOME		\$ 1,860,044	\$ 3,425,739

NET UTILITY PLANT (ACCTS. 101 - 106)

Account No.	Plant Accounts	Total
101	Utility Plant in Service	\$ 248,118,189
102	Utility Plant Leased to Others	
103	Property Held for Future Use	
104	Utility Plant Purchased or Sold	
105	Construction Work in Progress	19,984,295
106	Completed Construction Not Classified	
	Total Utility Plant	\$ 268,102,484

ACCUMULATED DEPRECIATION (ACCT. 108)

Description	Total
Balance first of year	\$ 48,288,707
Credit during year:	
Accruals Charged to Account 108.1	5,361,019
Accruals Charged to Account 108.2	
Accruals Charged to Account 108.3	
Accruals Charged to Other Accounts (specify)	

Salvage	
Other Credits (specify)	

Total Credits	\$ 5,361,019
Debits during year:	
Book Cost of Plant Retired	\$ 448,585
Cost of Removal	
Other Debits (specify)	

Total Debits	\$ 448,585
Balance end of year	\$ 53,201,141

Analysis of Accumulated Depreciation and Amortization by Primary Account

Acct. No. (a)	Account (b)	Balance Beginning of Year (c)	Credits During the Year:		Charges During The Year:		Balance End of Year (h)
			Charges to Dep. Exp. (d)	Other Credits (e)	Plant Retirements (f)	Other Charges (g)	
301	Organization	\$	\$	\$	\$	\$	
302	Franchises						
303	Limited Term Interest in Land and Land Rights						
304	Structures & Improvements	11,350,180	1,636,856		64		12,986,973
305	Collecting & Impounding Reservoirs						
306	Lake River & Other Intakes	601,663	77,488				
307	Wells & Springs						
309	Supply Mains	339,414	23,312				679,151
310	Power Generating Equip.						
311	Pumping Equipment	3,408,410	378,605		1,711		362,726
320	Water Treatment Equip.	2,717,676	401,104		750		3,785,305
330	Distribution Reservoirs & Standpipes	2,542,407	133,754				3,118,030
331	Transmissions & Distribution Mains	12,557,965	1,178,856				2,676,161
333	Services	5,832,871	402,138		272,235		13,464,586
334	Meters & Meter Installations	1,490,420	163,288				6,235,009
335	Hydrants	1,193,249	95,598				1,653,708
339	Other Plant & Misc. Equip.	1,143,633	327,355		1,666		1,288,847
340	Office Furniture & Equip.						1,469,322
341	Transportation Equip.	1,756,251	242,311		14,676		1,983,886
342	Service Equipment	1,833,191	228,190		157,485		1,903,896
343	Tools, Shop & Garage Equip.	273,713	3,348				
344	Shop Equipment						277,061
345	Power Operated Equip.	398,481	50,127				
346	Telecommunication Equipment						
347	Scada						448,608
348	Other Tangible Plant	849,183	18,691				
	Totals	\$ 48,288,707	\$ 5,361,019	\$ -	\$ 448,585	\$ -	\$ 53,201,141

Investments and Special Funds (Acct. 123-127)

Report hereunder all investments and special funds carried in Account 123-127.

Description of Security or Special Fund (a)	Face or Par Value (b)	Year-End Book Cost c
Investment In Associated Companies (Acct. 123): _____ _____ _____ Total Investment in Asso. Companies	\$ _____ \$ _____	\$ _____ \$ _____
Utility Investments (Acct. 124):		
IRR Account	\$ _____	\$ 3,074,102
Debt Service Account		6,547,631
Debt Service Reserve Account		12,289,650
Total Utility Investments		\$ 21,911,383
Other Investments (Acct. 125):		
Boone County/Florence KY Settlement	\$ _____	\$ 3,783,211
_____	_____	_____
_____	_____	_____
Total Other Investments:	\$ _____	\$ 3,783,211
Special Funds (Acct. 126 & 127):		
Prepayment Reserve	_____	_____
_____	_____	_____
_____	_____	_____
Total Special Funds	_____	\$ _____

Materials and Supplies (151 - 153)

Account Name	Total
Plant Materials and Supplies (Account 151)	\$ 1,150,975
Merchandise (Account 152)	
Other Materials and Supplies (Account 153)	
Total Materials & Supplies	\$ 1,150,975

Prepayments (Acct. 162)

Description	Total
Prepaid Insurance	\$ 134,674
Prepaid Rents	
Prepaid Interest	
Prepaid Taxes	
Other Prepayments (Specify)	
Expenses/Services	\$ 110,375
Water Tower Painting	2,095,890
Total Prepayments	\$ 2,340,939

Miscellaneous Deferred Debits (Acct. 186)

Description	Total
Miscellaneous Deferred Debits (Acct. 186):	
Deferred Rate Case Expense 2002-2003	\$ 72,543
Deferred Rate Case Expense 2003-2004	103,450
Deferred Rate Case Expense 2004-2006	211,583
Other Deferred Debits	6,536,606
Total Miscellaneous Deferred Debits	\$ 6,924,182

Unamortized Debt Discount & Expense & Premium on Debt (Accts. 181 & 251)

Report the net discount & expense or premium separately for each security issue.

Description	Amount Written Off During Year	Year-End Balance
Unamortized Debt Discount & Expense (Acct. 181)		
Bond Issue Cost 1997	\$ 4,916	\$ 82,748
Bond Discount 1997	6,735	113,373
Bond Discount 1998	7,570	173,479
Bond Issue Costs 1998	3,147	72,137
Cost of Issue 2001 Bond	3,699	77,084
Discount 2001 Bond	13,038	271,636
Cost of Issue 2002 A	13,731	289,495
Bond Discount 2002 A	27,209	573,657
Cost of Issue 2002 B	9,300	111,214
Cost of Issue 2003 A	1,620	40,790
Bond Discount 2003 A	1,087	28,366
Cost of Issue 2003 B	11,760	262,670
Bond Discount 2003 B	8,520	190,993
Cost of Issue 2003 C	14,940	217,833
Discount 2003 C	7,404	104,297
Cost of issue 2004A BAN	11,004	2,743
Discount 2004A BAN	7,824	1,954
Cost of issue 2004A Bonds	3,252	77,456
Discount 2004A Bond	7,920	188,662
Cost of issue 2005A BAN	14,648	29,294
Discount 2005 BAN	23,256	46,506
Total Unamortized Debt Discount & Expense	\$ 202,580	\$ 2,956,387
Unamortized Premium on Debt (Acct. 251):		
Premium on 2002 B Bond	\$ 63,877	\$ 58,949
Total Unamortized Premium on Debt	\$ 63,877	\$ 58,949

Northern Kentucky Water Service District

Attachment 22-B

Bond Issue: 11,355,000, Dated December 1, 1998

Bond Number	Maturity Date	Interest Rate	Principle Amount	Amounts Paid	Outstanding
Registered	02/01/1999	4.700%	250,000.00	250,000.00	
Registered	02/01/2000	4.700%	200,000.00	200,000.00	
Registered	02/01/2001	4.700%	200,000.00	200,000.00	
Registered	02/01/2002	4.700%	210,000.00	210,000.00	
Registered	02/01/2003	4.700%	220,000.00	220,000.00	
Registered	02/01/2004	4.700%	230,000.00	230,000.00	
Registered	02/01/2005	4.700%	240,000.00	240,000.00	
Registered	02/01/2006	4.700%	255,000.00		255,000.00
Registered	02/01/2007	4.700%	265,000.00		265,000.00
Registered	02/01/2008	4.750%	280,000.00		280,000.00
Registered	02/01/2009	4.750%	280,000.00		280,000.00
Registered	02/01/2010	4.750%	295,000.00		295,000.00
Registered	02/01/2011	4.750%	310,000.00		310,000.00
Registered	02/01/2012	4.750%	325,000.00		325,000.00
Registered	02/01/2013	4.800%	340,000.00		340,000.00
Registered	02/01/2014	4.850%	360,000.00		360,000.00
Registered	02/01/2015	4.875%	375,000.00		375,000.00
Registered	02/01/2016	4.875%	395,000.00		395,000.00
Registered	02/01/2017	4.875%	415,000.00		415,000.00
Registered	02/01/2018	4.875%	435,000.00		435,000.00
Registered	02/01/2019	4.875%	455,000.00		455,000.00
Registered	02/01/2020	4.875%	480,000.00		480,000.00
Registered	02/01/2021	4.875%	505,000.00		505,000.00
Registered	02/01/2022	4.875%	530,000.00		530,000.00
Registered	02/01/2023	4.875%	555,000.00		555,000.00
Registered	02/01/2024	4.875%	585,000.00		585,000.00
Registered	02/01/2025	4.875%	610,000.00		610,000.00
Registered	02/01/2026	4.875%	645,000.00		645,000.00
Registered	02/01/2027	4.875%	675,000.00		675,000.00
Registered	02/01/2028	4.875%	435,000.00		435,000.00
TOTALS			11,355,000.00	1,550,000.00	9,805,000.00

Northern Kentucky Water Service District

Attachment 22-D

Bond Issue \$16,325,000.00 Dated 10-23-2001

Bond Number	Maturity Date	Interest Rate	Principle Amount	Amounts Paid	Outstanding
Registered	2/1/2002	2.700%	285,000.00	285,000.00	
Registered	2/1/2003	3.000%	235,000.00	235,000.00	
Registered	2/1/2004	3.250%	240,000.00	240,000.00	
Registered	2/1/2005	3.450%	230,000.00	230,000.00	
Registered	2/1/2006	3.600%	215,000.00		215,000.00
Registered	2/1/2007	3.750%	195,000.00		195,000.00
Registered	2/1/2008	3.900%	170,000.00		170,000.00
Registered	2/1/2009	4.000%	155,000.00		155,000.00
Registered	2/1/2010	4.100%	75,000.00		75,000.00
Registered	2/1/2011	4.200%	80,000.00		80,000.00
Registered	2/1/2012	4.350%	80,000.00		80,000.00
Registered	2/1/2013	4.450%	735,000.00		735,000.00
Registered	2/1/2014	4.550%	770,000.00		770,000.00
Registered	2/1/2015	4.670%	810,000.00		810,000.00
Registered	2/1/2016	4.750%	845,000.00		845,000.00
Registered	2/1/2017	4.820%	890,000.00		890,000.00
Registered	2/1/2018	4.850%	930,000.00		930,000.00
Registered	2/1/2018	4.850%	980,000.00		980,000.00
Registered	2/1/2019	4.900%	980,000.00		1,030,000.00
Registered	2/1/2020	4.950%	1,030,000.00		1,080,000.00
Registered	2/1/2021	5.000%	1,080,000.00		1,135,000.00
Registered	2/1/2022	5.000%	1,135,000.00		1,195,000.00
Registered	2/1/2023	5.000%	1,195,000.00		1,255,000.00
Registered	2/1/2024	5.100%	1,255,000.00		1,320,000.00
Registered	2/1/2025	5.100%	1,320,000.00		1,390,000.00
Registered	2/1/2026	5.100%	1,390,000.00		1,390,000.00
TOTALS			16,325,000.00	990,000.00	15,335,000.00

Northern Kentucky Water Service District

Bond Issue \$10,575,000.00 Dated 12/5/2002

Bond Number	Maturity Date	Interest Rate	Principle Amount	Amounts Paid	Outstanding
Registered	12/5/2002				
Registered	2/1/2003	3.00%	535,000.00	535,000.00	
Registered	2/1/2004	3.00%	455,000.00	455,000.00	
Registered	2/1/2005	3.00%	490,000.00	490,000.00	
Registered	2/1/2006	3.00%	530,000.00		530,000.00
Registered	2/1/2007	3.50%	580,000.00		580,000.00
Registered	2/1/2008	3.50%	625,000.00		625,000.00
Registered	2/1/2009	3.50%	745,000.00		745,000.00
Registered	2/1/2010	3.75%	775,000.00		775,000.00
Registered	2/1/2111	4.00%	805,000.00		805,000.00
Registered	2/1/2112	4.00%	835,000.00		835,000.00
Registered	2/1/2113	4.00%	870,000.00		870,000.00
Registered	2/1/2114	4.00%	900,000.00		900,000.00
Registered	2/1/2115	4.00%	930,000.00		930,000.00
Registered	2/1/2116	4.00%	965,000.00		965,000.00
Registered	2/1/2117	4.00%	535,000.00		535,000.00
TOTALS			10,575,000.00	1,480,000.00	9,095,000.00

Northern Kentucky Water Service District
 2003 Series B
 Bond Issue \$30,270,000.00 Dated 8/1/2003

Bond Number	Maturity Date	Interest Rate	Principle Amount	Amounts Paid	Outstanding
Registered	2/1/2004	0.02	825,000.00	825,000.00	
Registered	2/1/2005	2.00%	845,000.00	845,000.00	
Registered	2/1/2006	2.00%	860,000.00		860,000.00
Registered	2/1/2007	2.00%	880,000.00		880,000.00
Registered	2/1/2008	2.00%	895,000.00		895,000.00
Registered	2/1/2004	2.25%	915,000.00		915,000.00
Registered	2/1/2010	2.75%	940,000.00		940,000.00
Registered	2/1/2011	3.00%	965,000.00		965,000.00
Registered	2/1/2012	3.13%	995,000.00		995,000.00
Registered	2/1/2013	3.13%	1,030,000.00		1,030,000.00
Registered	2/1/2014	3.13%	1,060,000.00		1,060,000.00
Registered	2/1/2015	3.25%	1,095,000.00		1,095,000.00
Registered	2/1/2016	3.50%	1,135,000.00		1,135,000.00
Registered	2/1/2017	4.00%	1,175,000.00		1,175,000.00
Registered	2/1/2018	4.00%	1,225,000.00		1,225,000.00
Registered	2/1/2019	4.00%	1,275,000.00		1,275,000.00
Registered	2/1/2020	4.13%	1,325,000.00		1,325,000.00
Registered	2/1/2021	4.13%	1,380,000.00		1,380,000.00
Registered	2/1/2022	1.43%	1,440,000.00		1,440,000.00
Registered	2/1/2023	4.13%	1,500,000.00		1,500,000.00
Registered	2/1/2024	4.13%	1,565,000.00		1,565,000.00
Registered	2/1/2025	4.13%	1,630,000.00		1,630,000.00
Registered	2/1/2026	4.13%	1,700,000.00		1,700,000.00
Registered	2/1/2027	4.13%	1,770,000.00		1,770,000.00
Registered	2/1/2028	4.13%	1,845,000.00		1,845,000.00
TOTALS			30,270,000.00	1,670,000.00	28,600,000.00

Northern Kentucky Water Service District

Bond Issue

Dated 2/1/2002

Bond Number	Maturity Date	Interest Rate	Principle Amount	Amounts Paid	Outstanding
Registered	2/1/2005		270,000.00	270,000.00	
Registered	2/1/2006		275,000.00		275,000.00
Registered	2/1/2007		285,000.00		285,000.00
Registered	2/1/2008		290,000.00		290,000.00
Registered	2/1/2009		295,000.00		295,000.00
Registered	2/1/2010		305,000.00		305,000.00
Registered	2/1/2111		315,000.00		315,000.00
Registered	2/1/2012		325,000.00		325,000.00
Registered	2/1/2013		335,000.00		335,000.00
Registered	2/1/2114		345,000.00		345,000.00
Registered	2/1/2115		360,000.00		360,000.00
Registered	2/1/2116		375,000.00		375,000.00
Registered	2/1/2117		390,000.00		390,000.00
Registered	2/1/2118		405,000.00		405,000.00
Registered	2/1/2119		425,000.00		425,000.00
Registered	2/1/2020		460,000.00		460,000.00
Registered	2/1/2021		485,000.00		485,000.00
Registered	2/1/2022		505,000.00		505,000.00
Registered	2/1/2023		530,000.00		530,000.00
Registered	2/1/2024		555,000.00		555,000.00
Registered	2/1/2025		580,000.00		580,000.00
Registered	2/1/2026		605,000.00		605,000.00
Registered	2/1/2027		635,000.00		635,000.00
Registered	2/1/2028		665,000.00		665,000.00
TOTALS			10,015,000.00	270,000.00	9,745,000.00

Notes Payable (Acct. 232 & 234)

a	Nominal Date of Issue b	Date of Maturity c	INTEREST		Principal Amount per Balance Sheet f
			Rate d	Amount of payment e	
Account 232 - Note Payable					
Kenton Co. Fiscal Court					\$ 100,000
BAN 2004A					61,285.00
BAN 2005A					876,920.00
Total Account 232					\$ 21,685,000
Account 234 - Notes Payable To Associated Companies					
					\$
					\$
					\$
					\$
Total Account 234					\$

Accounts Payable to Associated Companies (Acct. 233)

Show Payable to Each Associated Company Separately	Amount
	\$
N/A	
Total	\$

TAXES ACCRUED (ACCOUNT 236)

ACCT. NO. (a)	DESCRIPTION (b)	TOTAL ©
	Balance first of year.....	\$ -
	Accruals Charged:	
408.1	Utility regulatory assessment fees.....	
408.11	Property taxes.....	544,011
408.12	Payroll taxes.....	
408.13	Other taxes and licenses.....	
408.2	Taxes other than income, other income and deductions	
	Total taxes accrued.....	\$ 544,011
	Taxes paid during year:	
408.1	Utility regulatory assessment fees.....	
408.11	Property taxes.....	544,011
408.12	Payroll taxes.....	
408.13	Other taxes and licenses.....	
408.2	Taxes other than income, other income and deductions	
	Total taxes paid.....	\$ 544,011
	Balance end of year.....	\$ -

ACCRUED INTEREST (ACCOUNT 237)

DESC. DEBT (a)	BALANCE BEGINNING OF YEAR (b)	INTEREST ACCRUED DURING YEAR (c)	INTEREST PAID DURING YEAR (d)	BALANCE END OF YEAR (e)
Acct. No. 237.1 - Accrued Interest on Long-term Debt				
Series 1997	139,619	301,911	316,990	124,540
Series 1998	202,724	476,086	480,836	197,973
2000 RUS Loan	18,500	110,200	110,400	18,300
Series 2001	307,135	729,746	733,100	303,781
Series 2002 A	910,268	2,169,789	2,176,540	903,517
Series 2002 B	151,689	350,582	356,706	145,565
Series 2003 A	27,216	64,878	65,078	27,016
Series 2003 B	436,499	1,032,109	1,039,150	429,458
Series 2003 C	316,476	738,278	747,944	306,810
Series 2004 A	68,005	402,735	303,323	167,417
Total Acct No. 237.1	\$ 2,578,131	\$ 6,376,313	\$ 6,330,068	\$ 2,624,376
Acct. No. 237.2 - Accrued Interest on Other Liabilities:				
2004 BAN # 1	\$ 30,643	\$ 45,964	\$ 61,285	\$ 15,321
2005 BAN # 2		374,965	277,566	97,399
Total Acct No. 237.2	\$ 30,643	\$ 420,929	\$ 338,851	\$ 112,720
Total Acct No 237	\$ 2,608,774	\$ 6,797,242	\$ 6,668,919	\$ 2,737,097

Miscellaneous Current & Accrued Liabilities (Account 242)

Description (a)	Balance End of Year (b)
Accrued Payroll Taxes	\$ 3,265
Accrued Payroll	141,235
Accrued Sales Taxes	58,086
Accrued Pension	118,462
Accrued Vacation/Sick	742,606
Subdistrict Surcharges Payable	565,669
Total Miscellaneous Current & Accrued Liabilities.....	\$ 1,629,323

241-0007-000

Regulatory Commission Expense (Accounts 666 and 667)

DESCRIPTION OF CASE (DOCKET #) (a)	TOTAL INCURRED DURING YEAR (b)	AMOUNT TRANSFERRED TO ACCOUNT # 186.1 (c)	EXPENSED DURING YEAR	
			ACCT. (d)	AMOUNT (e)
Rate Case 2005-0148 (Case still pending as of 12/31/05)	195,519	211,583		
Rate Case 2002-0105			667	\$ 145,116
Rate Case 2003-0234			667	\$ 62,076

Water Utility Expense Accounts

Acct. No.	Account Name	Current Year	Water Expense Account Matrix							
			0.1	0.2	0.3	0.4	.5	0.6	0.7	0.8
a	b	c	Source of Supply & Expenses Operation	Source of Supply & Expenses Mainten.	Water Treatment Expenses/ Operation	Water Treatment Expenses/ Maint.	Trans. & Distribut Expenses Operation	Trans. & Dist. Expenses Maint.	Customer Accounts Expense	Administrative Gen Expenses
			d	e	f	g	h	i	j	k
601	Salaries and Wages - Employees	\$ 6,811,773	-	46	1,449,102	493,118	618,775	1,969,869	1,634,355	646,507
603	Salaries and Wages - Officers, Directors & Majority Stockholders	656,510	-	-	100,256	-	105,227	-	89,586	361,442
604	Employee Pensions and Benefits	2,413,137	-	-	507,288	93,400	425,806	458,966	579,157	348,520
610	Purchased Water	-	-	xxx	xxx	xxx	xxx	xxx	xxx	xxx
615	Purchased Power	2,121,220	609,258	xxx	355,921	xxx	1,047,697	xxx	-	108,344
616	Fuel for Power Production	-	-	-	-	-	-	-	-	-
618	Chemicals	1,035,885	-	-	1,035,885	-	-	-	xxx	xxx
620	Materials & Supplies	1,680,127	29,684	-	157,892	155,011	98,372	797,313	218,988	222,867
631	Contractual Services - Eng.	95,651	-	-	-	-	78,527	17,124	-	-
632	Contractual Services - Acct.	16,875	-	-	-	-	-	-	-	16,875
633	Contractual Services - Legal	114,219	-	-	4,579	-	19,707	-	3,341	86,592
634	Contractual Services - Management Fees	3,211	-	-	-	-	-	-	-	3,211
635	Contractual Services - Other	3,541,011	1,776	136,443	506,785	186,092	157,126	1,718,312	117,541	716,936
641	Rental of Bldg./Real Property	10,689	-	-	-	-	-	-	-	10,689
642	Rental of Equipment	-	-	-	-	-	-	-	-	-
650	Transportation Expenses	414,604	-	174	35,809	392	36,412	246,986	89,377	5,454
656	Insurance - Vehicle	86,502	-	-	16,459	-	42,456	-	23,807	3,780
657	Insurance - General Liability	272,040	-	-	87,048	-	144,180	-	27,204	13,608
658	Insurance - Worker's Comp	223,343	-	-	57,808	-	77,548	-	57,947	30,040
659	Insurance - Other	139,539	-	-	35,090	-	-	-	-	104,449
660	Advertising Expense	10,743	xxx	xxx	xxx	xxx	xxx	xxx	xxx	10,743
666	Regulatory Commission Exp/ Amortization of Rate Case Exp.	-	xxx	xxx	xxx	xxx	xxx	xxx	xxx	-
667	Regulatory Commission Exp/Other	258,404	-	-	-	-	-	-	258,404	-
670	Bad Debt Expense	524,536	xxx	xxx	xxx	xxx	xxx	xxx	524,536	xxx
675	Miscellaneous Expenses	49,257	-	-	5,387	187	6,886	8,333	9,402	19,062
	Total Water Utility Expenses	\$ 20,479,276	611,034	166,347	4,355,309	928,200	2,858,719	5,216,903	3,633,645	2,709,119

Pumping and Purchased Water Statistics

a	Water Purchased for Resale (Omit 000's) b	Water Pumped From Plants (Omit 000's) c	Total Water Pumped and Purchased (Omit 000's) d	Water Sold to Customers (Omit 000's) e
January		817,046.0	817,046.0	578,988.5
February		717,280.0	717,280.0	522,693.4
March		798,635.0	798,635.0	797,018.2
April		813,137.2	813,137.2	536,147.7
May		899,865.0	899,865.0	519,882.4
June		1,042,279.0	1,042,279.0	887,043.5
July		1,057,621.0	1,057,621.0	675,504.6
August		1,107,166.0	1,107,166.0	639,786.1
September		908,699.0	908,699.0	1,211,747.3
October		870,173.2	870,173.2	763,043.8
November		788,829.0	788,829.0	706,168.1
December		812,867.9	812,867.9	965,766.0
Total for year		10,633,598.3	10,633,598.3	8,803,789.6
Maximum gallons pumped by all methods in any one day: 8/4/2005				44,476.0
Minimum gallons pumped by all methods in any one day (Omit 000's): 12/25/2005				21,915.0
If water is purchased for resale, indicate the following: Vendor: _____ Point of delivery: _____				
If water is sold to other water utilities for redistribution, list names of such utilities below:				
Pendleton County Water District				
City of Walton				
Bullock Pen Water District				

WATER STATISTICS

Line	Item	Gallons (000's)
1	WATER PRODUCED, PURCHASED, & DISTRIBUTED	
2	Water Produced	10,633,598
3	Water Purchased	
4	TOTAL PRODUCED AND PURCHASED	10,633,598
5		
6	WATER SALES:	
7	Residential	5,931,183
8	Commercial	1,659,182.2
9	Industrial	847,058.4
10	Irrigation	-
11	Resale	350,825.7
12	Other Sales	15,541
13	TOTAL WATER SALES	8,803,789.6
14		
15	OTHER WATER USED (estimate portions not metered)	
16	Utility/water treatment plant	175,351.9
17	Wastewater plant	0.0
18	System flushing	190,433.0
19	Water main breaks/leaks	97,238.0
20	Storage tank overflow	0.0
21	Fire Department	8,300.0
22	Other (construction, flushing, disinfection, ect.)	4,240.0
23	TOTAL OTHER WATER USED	475,562.9
24		
25	UNACCOUNTED-FOR WATER LOSS:	
26	Line 4 - (Line 13 + Line 23)	1,354,245.8
27		
28	UNACCOUNTED-FOR WATER LOSS PERCENTAGE	
29	Line 26 divided by Line 4	12.74%

Water Storage Facilities
 Northern Kentucky Water District
 Updated: 4/26/2006

Attachment 31A

Storage Location	Address	City Location	Type Of Storage	Year In Service	Structure Height (Feet)	Base Elevation (Feet)	Top Elevation (Feet)	Overflow Elevation (Feet)	Normal Elevation (Feet)	Normal Elevation (Feet)	Diameter (Feet)	Capacity (Gallons)
Aqua Drive	100 Aqua Drive	Cold Spring	Hydropillar		184			1017				2,000,000
Barrington Road	2 Barrington Road	Ft. Wright	Hydropillar	1969	141	916.5	1057.5	1046.7	1045.0	1040.0	74	1,000,000
Bromley	1674 Highwater Road	Bromley	Ground Storage	1966	103	670.0	773.0	764.0	763.0	750.0	75	3,000,000
Dayton Avenue	2816 Dayton St.	Dayton	Ground Storage		50			829.0				500,000
Devon	US 25	Florence	Hydropillar	1991	156	939.5		1082.0		1042.0	100	2,000,000
Dudley Pike	796 Dudley Pike	Edgewood	Ground Storage	1964	59	831.0	889.5	876.0	874.0	866.0	140	5,000,000
Dudley Pike	796 Dudley Pike	Edgewood	Ground Storage	1990	59	831.0	889.5	876.0	874.0	866.0	140	5,000,000
Ft. Thomas Plant	700 Alexandria Pike	Ft. Thomas	Clearwell	1936	31	734.0	765.3	764.5	762.0	760.0		3,000,000
Ft. Thomas Plant	700 Alexandria Pike	Ft. Thomas	Clearwell	1990	35	730.0	778.5	764.5	763.5	757.5	130	3,500,000
Harrison Ave.	2361 Harrison Ave.	Bellevue	Ground Storage		60			829.0				600,000
Ida Spence	Tower Place	Covington	Elevated Tank	1952	175	840.0	1015.0	1005.0	1003.0	1000.0	57	500,000
Independence	5685 Madison Pike	Independence	Hydropillar	1981	137	943.5		1080.0		1039.5	74	1,000,000
Industrial Park	Industrial Rd. & US 25	Florence	Hydropillar	1961	146	945.5	1091.5	1083.5	1081.0	1062.0	50	500,000
John's Hill Road	Knollwood Dr.	Highland Hts.	Elevated Tank		113			1017.0				500,000
Kenton Lands Rd.	25 Kenton Lands Road	Erlanger	Elevated Tank	1953	158	896.0	1054.0	1045.0	1043.0	1033.0	50	500,000
Lumley Tank	R47 Lumley Ave.	Fort Thomas	Elevated Tank	1937	187			1017.0				275,000
Main St. Tank	Main St. & US 27	Alexandria	Elevated Tank	1962	152			1017.0				300,000
Memorial Pkwy. Plant	2055 Memorial Pkwy.	Fort Thomas	Clearwell					741.0				3,000,000
Old St. 4 Tank	Old St. Road #4	Claryville	Elevated Tank	1976	143			1017.0				1,000,000
Rossford Tank	Marion Dr.	Fort Thomas	Elevated Tank	1962	191			1017.0				300,000
South Newport Tank	Kentucky Drive	Newport	Elevated Tank		155			965.0				1,000,000
Taylor Mill Plant	608 Grand Ave.	Taylor Mill	Clearwell		15	509.5	524.5	522.0	520.0	518.0		1,000,000
Taylor Mill Standpipe	5907 Taylor Mill Rd.	Taylor Mill	Standpipe		143			1010.0		110.0		329,000
Total storage owned by NKWSD:											35,804,000	

Attachment 31B

Size	Type	Prior Years	2004 Additions	2004 Retirements	2004 YTD TOTAL	2004 Miles	2004 Percent	2005 Additions	2005 Retirements	2005 YTD TOTALS	2005 Miles	2005 Percent
"	Copper	52.00			52.00	0.01	0.001%			52.00	0.010	0.001%
	Copper	3,787.00			3,787.00	0.72	0.066%			3,787.00	0.717	0.065%
/2"	Copper	4,150.00			4,150.00	0.79	0.072%			4,150.00	0.786	0.071%
	Copper	12,648.30			12,648.30	2.40	0.221%			12,648.30	2.396	0.218%
	Plastic	2,973.00			2,973.00	0.56	0.052%			2,973.00	0.563	0.051%
/2"	Plastic	2,292.00			2,292.00	0.43	0.040%			2,292.00	0.434	0.039%
	Plastic	66,168.00	2,120.00		68,288.00	12.93	1.191%	2,551.00		70,839.00	13.416	1.220%
	Plastic	114,986.00			114,986.00	21.78	2.005%			114,986.00	21.778	1.980%
	Plastic	29,539.00			29,539.00	5.59	0.515%			29,539.00	5.595	0.509%
	Plastic	123,346.60	7,320.00		130,666.60	24.75	2.278%	6,499.00		137,165.60	25.978	2.362%
	Plastic	347,923.00	36,101.00		384,024.00	72.73	6.695%	37,848.00		421,872.00	79.900	7.264%
"	Plastic	5,839.00			5,839.00	1.11	0.102%	8,555.00		14,394.00	2.726	0.248%
	TOTAL	5,388,495.11	386,128.48	22,013.00	5,735,788.59	1,086.32	100.0%	98,229.00	27,633.00	5,804,379.59	1,099.99	100.0%

KENTUCKY PUBLIC SERVICE COMMISSION
REPORT OF GROSS OPERATING REVENUES DERIVED FROM INTRA-KENTUCKY
BUSINESS FOR THE YEAR ENDING DECEMBER 31, 20 06

NORTHERN KENTUCKY WATER DISTRICT 100 AQUA DRIVE - P.O. BOX 220 - COLD SPRING
(Utility Reporting) (Address)

FEIN # (Federal Employer Identification Number)

6 1 - 1 3 1 1 6 9 5

(DO NOT INCLUDE TAXES COLLECTED)

- (1) Gross Revenues of Electric Utility.....\$
(2) Gross Revenues of Gas Utility.....\$
(3) Gross Revenues of Water Utility.....\$ 33,229,279.00
(4) Gross Revenues of Sewer Utility.....\$
(5) Other Operating Revenues.....\$ 1,716,334.00
*** TOTAL GROSS REVENUES.....\$ 34,945,623.00

OATH

State of...KENTUCKY.....)
County of...CAMPBELL.....) ss.

JACK BRAGG, CPA, CMA being duly sworn, states that he/she is
(Officer)

VICE-PRESIDENT OF FINANCE of the NORTHERN KENTUCKY WATER DISTRICT that the above
(Official Title) (Utility Reporting)

report of gross revenues is in exact accordance with NORTHERN KENTUCKY WATER DISTRICT, and that such
(Utility Reporting)

books accurately show the gross revenues of: NORTHERN KENTUCKY WATER DISTRICT, derived from
(Utility Reporting)

Intra-Kentucky business for the calendar year ending December 31, 20 06

[Signature] VICE-PRESIDENT OF FINANCE
(Officer) (Title)

This the 30 day of March, 20 06

[Signature] (Notary Public) Campbell (County) 4-8-08 (Commission Expires)

NOTE: ANY DIFFERENCE BETWEEN THE AMOUNT OF THE GROSS REVENUES SHOWN IN THE
ANNUAL REPORT AND THE AMOUNT APPEARING ON THIS STATEMENT MUST BE
RECONCILED ON THE REVERSE OF THIS REPORT.



Ernie Fletcher
Governor

LaJuana S. Wilcher, Secretary
Environmental and Public
Protection Cabinet

Christopher L. Lilly
Commissioner
Department of Public Protection

Commonwealth of Kentucky
Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, Kentucky 40602-0615
Telephone: (502) 564-3940
Fax: (502) 564-3460
psc.ky.gov

Mark David Goss
Chairman

Teresa J. Hill
Vice Chairman

Gregory Coker
Commissioner

March 28, 2006

Hon. John N. Hughes
Attorney At Law
124 W. Todd Street
Frankfort, KY 40601

RE: Northern Kentucky Water District

Dear Mr. Hughes:

Your request, on behalf of Northern Kentucky Water District, for an extension of time to May 1, 2006, for filing of the 2005 annual report of Northern Kentucky Water District is being granted, with the understanding that every effort will be made to complete and file the annual report at an earlier date.

An extension for filing the Report of Gross Operating Revenues Derived From Intra-Kentucky Business can not be granted. It is to be filed before March 31, 2006. Failure to comply with Commission Regulation 807 KAR 5:006, Section 3(1) and KRS 278.140, may result in the imposition of penalties as provided in KRS 278.990 and **WILL** result in the revocation of the extension for filing the Annual Report.

Sincerely,

Bill Feldman
Assistant Director
Filings Division

✓ cc: Northern Kentucky Water District

Case No. 2006-____
Exhibit F

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

SCHEDULE OF MORTGAGES, BONDS, NOTES, AND
OTHER INDEBTEDNESS

Northern Kentucky Water District

Bonds Payable and Current Portion

Account No.	Description	Bond Payable Nov 01 2006	Current Portion Payment Feb 2007	Bond Payable 2006
220-0007-000	Bonds Payable 1997	\$5,500,000	\$850,000	\$4,650,000
220-0008-000	Bonds Payable 1998	\$9,550,000	\$265,000	\$9,285,000
220-0009-000	Rural Development Loan Payable(2000)	\$2,170,000	\$27,000	\$2,143,000
220-0010-000	2001 Bonds Payable	\$15,120,000	\$200,000	\$14,920,000
220-0011-000	2002 A Bonds Payable	\$44,060,000	\$380,000	\$43,680,000
220-0012-000	2002 B Payable-Refunding	\$8,565,000	\$580,000	\$7,985,000
220-0013-000	2003 A Refunding Bonds Payable	\$1,510,000	\$35,000	\$1,475,000
220-0014-000	Series 2003 B Bonds Payable	\$27,740,000	\$880,000	\$26,860,000
220-0015-000	2003 C Refunding Bonds Payable	\$20,020,000	\$1,215,000	\$18,805,000
220-0016-000	Series 2004 A Bonds Payable	\$9,910,000	\$285,000	\$9,625,000
220-0017-000	Series 2006 A Bonds Payable	\$28,700,000	\$300,000	\$29,000,000
	Total Long Term Debt	\$172,845,000	\$5,017,000	\$168,428,000
232-0000-000	Note Payable- C. C. Fiscal Court			\$100,000
232-0100-000	Note Payable City of Taylor Mill	\$1,875,000	\$250,000	\$2,125,000
	Total BAN's and Notes			\$2,225,000
	Grand Total			\$ 175,370,000

Case No. 2006-____
Exhibit _____ G

NORTHERN KENTUCKY
WATER DISTRICT

Project
Dudley Pump Station Generator

Kenton County
184-0445

CURRENT BALANCE SHEET AND INCOME
STATEMENT

Northern Kentucky Water District

Balance Sheet
As of October 31, 2006

	<u>2006</u>	<u>2005</u>
ASSETS		
CURRENT ASSETS		
Cash and Cash Equivalents	\$5,280,089	\$4,886,410
Accrued Interest Receivable		
Accounts Receivable		
Customers	3,503,091	3,522,333
Unbilled Customers	4,900,000	4,900,000
Other	260,680	422,228
Assessments Receivable	37,767	37,251
Inventory Supplies for New Installation and Maintenance, at Cost	1,168,193	1,272,703
Prepaid Items	1,996,947	900,762
TOTAL CURRENT ASSETS	<u>17,146,767</u>	<u>15,941,687</u>
RESTRICTED ASSETS		
Boone/Florence Settlement Account	3,406,370	3,734,395
Bond Proceeds Fund	15,620,746	19,772,422
Debt Service Reserve Account	12,985,645	12,361,848
Debt Service Account	5,905,435	5,063,958
Improvement, Repair & Replacement	730,031	3,366,905
TOTAL RESTRICTED ASSETS	<u>38,648,227</u>	<u>44,299,528</u>
NONCURRENT ASSETS		
Miscellaneous Deferred Charges	9,420,673	9,785,766
Capital assets:		
Land, System, Buildings and Equipment	255,733,821	248,760,154
Construction in Progress	29,489,607	17,940,699
Total capital assets before accumulated depreciation	285,223,428	266,700,853
Less Accumulated Depreciation	(59,116,287)	(53,902,733)
Total capital assets before accumulated depreciation	<u>226,107,141</u>	<u>212,798,120</u>
TOTAL NONCURRENT ASSETS	<u>235,527,814</u>	<u>222,583,886</u>
TOTAL ASSETS	<u><u>291,322,808</u></u>	<u><u>282,825,101</u></u>

Northern Kentucky Water District

Balance Sheet
As of October 31, 2006

	<u>2006</u>	<u>2005</u>
LIABILITIES AND RETAINED EARNINGS		
CURRENT LIABILITIES		
Current Portion of Long Term Debt	<i>\$5,267,000</i>	<i>\$4,806,000</i>
Accounts Payable	<i>1,709,624</i>	<i>1,513,736</i>
Accrued Payroll & Liabilities	<i>334,181</i>	<i>269,862</i>
Other Accrued Liabilities	<i>96,028</i>	<i>102,434</i>
TOTAL CURRENT LIABILITIES	<u>7,406,833</u>	<u>6,692,032</u>
CURRENT LIABILITIES PAYABLE FROM RESTRICTED ASSETS		
Accounts Payable	<i>582,034</i>	<i>271,935</i>
Accrued Interest Payable	<i>1,651,151</i>	<i>1,930,550</i>
TOTAL CURRENT LIABILITIES PAYABLE FROM RESTRICTED ASSETS	<u>2,233,185</u>	<u>2,202,485</u>
LONG-TERM DEBT		
Long-Term Portion of Bonded Indebtedness	<i>168,128,000</i>	<i>144,145,000</i>
Bond Anticipation Notes Payable		<i>21,585,000</i>
Note Payable - Taylor Mill	<i>1,875,000</i>	<i>2,125,000</i>
Deferred Note Payable	<i>100,000</i>	<i>100,000</i>
TOTAL LONG-TERM DEBT	<u>170,103,000</u>	<u>167,955,000</u>
TOTAL LIABILITIES	<u>179,743,018</u>	<u>176,849,517</u>
Unrestricted Retained Earnings	<i>82,728,797</i>	<i>77,124,595</i>
TOTAL NET ASSETS	<u>111,579,789</u>	<u>105,975,587</u>
TOTAL LIABILITIES AND NET ASSETS	<u>291,322,807</u>	<u>282,825,104</u>

**Northern Kentucky Water District
Revenue Actual to Actual
For the Ten Months Ending October 31, 2006**

Acct	Description	October 2006	October 2005	Variance	YTD Oct 2006	YTD Oct 2005	Variance
	Revenue						
(461 TO 4...	Water Sales	\$2,836,549	\$2,831,995	0.16%	\$27,129,088	\$27,292,632	(0.60%)
(470 TO 470)	Forfeited Discounts	\$83,503	\$69,539	20.08%	\$581,377	\$629,760	(7.68%)
(47200010...	Rents from Water Property	\$72,337	\$42,927	68.51%	\$407,484	\$440,378	(7.47%)
(471 TO 4...	Other Water Revenues	\$27,005	\$22,525	19.89%	\$337,767	\$287,825	17.35%
	Total Operating Revenues	\$3,019,394	\$2,966,986	1.77%	\$28,455,716	\$28,650,595	(0.68%)
	Non-Operating Income						
419000100...	Interest Income	\$188,424	\$226,806	(16.92%)	\$1,731,544	\$1,356,698	27.63%
(474 TO 4...	Miscellaneous	\$51,563	\$11,715	340.15%	\$191,496	\$128,939	48.52%
	Total Non-Operating Income	\$239,987	\$238,521	0.61%	\$1,923,040	\$1,485,637	29.44%
	Total Revenues	\$3,259,381	\$3,205,507	1.68%	\$30,378,756	\$30,136,232	0.80%

Northern Kentucky Water District
Income Statement Actual to Actual
For the Ten Months Ending October 31, 2006

11/27/06
02:21 PM

<u>Description</u>	<u>October Actual 06</u>	<u>October 2005</u>	<u>Variance</u>	<u>October YTD 06</u>	<u>October YTD 2005</u>	<u>Variance</u>
Income						
Water Sales	\$2,836,549	\$2,831,995	0%	\$27,129,088	\$27,292,632	1%
Forfeited Discounts	83,503	69,539	(20%)	581,377	629,760	8%
Rents from Water Property	72,437	43,027	(68%)	408,484	441,378	8%
Other Water Revenues	27,005	22,525	(20%)	337,767	287,825	(15%)
Total Operating Revenues	\$3,019,494	\$2,967,086	(2%)	\$28,456,716	\$28,651,595	1%
Operating Expenses						
O & M Expenses						
Salaries & Wages	\$651,869	\$567,492	(15%)	\$6,325,357	\$6,175,371	(2%)
Employee Pension & Benefits	243,828	210,700	(16%)	2,365,937	2,012,985	(15%)
Taxes Other than Income Taxes	45,735	39,980	(14%)	452,875	439,781	(3%)
Purchased Power	174,821	147,177	(19%)	1,572,442	1,677,547	7%
Chemicals	95,356	101,254	6%	950,165	845,652	(11%)
Materials & Supplies	167,395	134,947	(24%)	1,512,254	1,294,664	(14%)
Contractual Services	217,801	464,490	53%	2,261,684	2,939,111	30%
Rent	0	835	100%	2,506	9,019	260%
Transportation	33,841	42,216	20%	379,351	331,151	(13%)
Insurance	72,584	55,511	(31%)	489,476	576,620	18%
Advertising	1,781	1,944	8%	13,472	8,907	(34%)
Bad Debt Expense	36,119	40,476	11%	437,397	431,918	(1%)
Miscellaneous	2,178	4,463	51%	67,432	41,352	(39%)
Regulatory Commission Assessment	9,944	21,745	54%	171,054	214,914	26%
Total O & M Expenses	\$1,753,252	\$1,833,230	4%	\$17,001,402	\$16,998,992	0%
Depreciation	\$450,000	\$440,000	(2%)	\$4,500,000	\$4,400,000	(2%)
Total Operating Expenses	\$2,203,252	\$2,273,230	3%	\$21,501,402	\$21,398,992	0%

Northern Kentucky Water District
Income Statement Actual to Actual
For the Ten Months Ending October 31, 2006

<u>Description</u>	<u>October Actual 06</u>	<u>October 2005</u>	<u>Variance</u>	<u>October YTD 06</u>	<u>October YTD 2005</u>	<u>Variance</u>
Net Operating Income (Loss)	\$816,242	\$693,856	(18%)	\$6,955,314	\$7,252,603	4%
Non-Operating Income (Expense)						
Interest Income	\$188,424	\$226,806	17%	\$1,731,544	\$1,356,698	(22%)
Miscellaneous	51,563	11,715	(340%)	191,496	128,939	(33%)
Interest on Long Term Debt	(578,468)	(584,238)	1%	(5,346,438)	(5,206,412)	(3%)
Amortization	(66,125)	(66,391)	0%	(654,217)	(644,955)	(1%)
Net Non-Operating Income (Expense)	(\$404,606)	(\$412,108)	2%	(\$4,077,615)	(\$4,365,730)	7%
Net Income before Contributions	\$411,636	\$281,748	(46%)	\$2,877,699	\$2,886,873	0%
Capital Contributions	\$67,622	\$557	(12,040%)	\$734,726	\$1,016,846	38%
Net Income (Loss)	\$479,258	\$282,305	(70%)	\$3,612,425	\$3,903,719	8%