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DOE/ET/13060-T3 (Vol.18)  
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PHASE I: THE PIPELINE GAS DEMONSTRATION PLANT  
DEMONSTRATION PLANT ENGINEERING AND DESIGN

Volume 18: Plant Section 2700—Waste Water Treatment

May 1981

Work Performed Under Contract No. AC01-77ET13060

Conoco Inc.  
Stamford, Connecticut

and

Foster Wheeler Energy Corporation  
Livingston, New Jersey

MASTER

FOSTER WHEELER ENERGY



U. S. DEPARTMENT OF ENERGY

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**PHASE I: THE PIPELINE GAS DEMONSTRATION PLANT**

**DEMONSTRATION PLANT ENGINEERING AND DESIGN**

**Volume 18**

**Plant Section 2700 - Waste Water Treatment**

**Conoco Inc.  
High Ridge Park  
Stamford, Connecticut 06904**

**and**

**Foster Wheeler Energy Corporation  
110 South Orange Avenue  
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**Prepared for the  
United States Department of Energy  
Division of Fossil Fuel Processing  
Under Contract EF-77-C-01-2542**

## ABSTRACT

Contract No. EF-77-C-01-2542 between Conoco Inc. and the U.S. Department of Energy provides for the design, construction, and operation of a demonstration plant capable of processing bituminous caking coals into clean pipeline quality gas. The project is currently in the design phase (Phase I). This phase is scheduled to be completed in June 1981.

One of the major efforts of Phase I is the process and project engineering design of the Demonstration Plant. The design has been completed and is being reported in 24 volumes. This is Volume 18 which reports the design of Plant Section 2700 - Waste Water Treatment.

The objective of the Waste Water Treatment system is to collect and treat all plant liquid effluent streams. The system is designed to permit recycle and reuse of the treated waste water. Plant Section 2700 is composed of primary, secondary, and tertiary waste water treatment methods plus an evaporation system which eliminates liquid discharge from the plant. The Waste Water Treatment Section is designed to produce 130 pounds per hour of sludge that is buried in a landfill on the plant site. The evaporated water is condensed and provides a portion of the make-up water to Plant Section 2400 - Cooling Water.

VOLUME INDEX  
FOR DEMONSTRATION PLANT ENGINEERING & DESIGN REPORT

<u>Volume</u>	<u>Title</u>
1	Executive Summary
2	Overall Plant
3	Plant Section 100 - Feedstock Preparation
4	Plant Section 200 - Air Separation
5	Plant Section 300 - Gasification
6	Plant Section 400 - Rectisol
7	Plant Section 500 - Shift/Methanation
8	Plant Section 600 - CO <sub>2</sub> Removal
9	Plant Section 800 - Product Gas Compression and Drying
10	Plant Section 900 - Sulfur Recovery
11	Plant Section 1000 - Slag Handling/Disposal
12	Plant Section 1100 - Gas Liquor Separation
13	Plant Section 1200 - Phenol Extraction
14	Plant Section 1300 - Ammonia Recovery
15	Plant Section 2000 - Water Treatment And Steam Plant
16	Plant Section 2400 - Cooling Water
17	Plant Section 2500 - Plant And Instrument Air
18	Plant Section 2700 - Waste Water Treatment
19	Plant Section 3000 - Flare
20	Plant Section 3200 - Miscellaneous Offsites And Tank Farm
21	Plant Section 3300 - County Road
22	Plant Section 4000 - Electrical and Communications
23	Plant Section 4100 - Buildings
24	Job Specifications

TABLE OF CONTENTS

	<u>Page</u>	
18.0	PLANT SECTION 2700-WASTE WATER TREATMENT	1
18.1	Process Operation	3
18.2	Design Basis	11
18.3	Material Balance	13
18.4	Stream Compositions	14
18.5	Utility, Catalyst and Chemical Summary	22
18.6	Major Equipment and Machinery List	23
18.7	Major Equipment and Machinery Requisitions (Data Sheet)	28
18.8	Instrument List	206
18.9	Instrument Requisitions (Data Sheets)	244
18.10	Line Lists	333
18.11	Process Flow Diagrams	344
18.12	Engineering Flow Diagrams (P & ID)	347
18.13	Section Plot Plan	355



## 18.0 PLANT SECTION 2700 - WASTE WATER TREATMENT

Contract No. EF-77-C-01-2542 between Conoco Inc. and the U.S. Department of Energy provides for the design, construction, and operation of a demonstration plant capable of processing bituminous caking coals into clean pipeline quality gas.

Work under the contract is to proceed in three phases:

- Phase I - Demonstration Plant Engineering and Design
- Phase II - Demonstration Plant Construction
- Phase III- Demonstration Plant Operation

One of the major efforts of Phase I is the completion of the process design and the project engineering design of the Demonstration Plant. This design effort has been completed.

The Demonstration Plant consists of the following plant sections:

<u>Section</u>		<u>Name</u>
100	-	Feedstock Preparation
200	-	Air Separation
300	-	Gasification
400	-	Rectisol
500	-	Shift/Methanation
600	-	CO <sub>2</sub> Removal
800	-	Product Gas Compression and Drying
900	-	Sulfur Recovery
1000	-	Slag Handling
1100	-	Gas Liquor Separation
1200	-	Phenol Extraction
1300	-	Ammonia Recovery
2000	-	Water Treatment and Steam Plant
2400	-	Cooling Water
2500	-	Plant and Instrument Air
2700	-	Waste Water Treatment
3000	-	Flare
3200	-	Miscellaneous Offsites and Tank Farm
3300	-	County Road
4000	-	Electrical and Communications
4100	-	Buildings

A report of the design effort of the Demonstration Plant is being issued in 24 volumes. This is Volume 18 which reports the design of Plant Section 2700 - Waste Water Treatment.

This report contains the following information on Plant Section 2700:

- a. Process Operation
- b. Design Basis
- c. Material Balance
- d. Stream Compositions
- e. Utility, Chemical, and Catalyst Summary
- f. Major Equipment and Machinery List
- g. Major Equipment and Machinery Requisitions
- h. Instrument List
- i. Instrument Requisitions
- j. Line Lists
- k. Process Flow Diagram
- l. Engineering Flow Diagrams
- m. Section Plot Plan

## 18.1 Process Operation

The objective of the waste water treatment system is to collect and treat all plant liquid effluent streams. The system is designed to permit recycle and reuse of the treated waste water. The unit is composed of primary, secondary, and tertiary waste water treatment methods plus an evaporation system which eliminates liquid discharge from the plant. Solid wastes from the treatment system are dewatered and disposed of in an on-site landfill.

### Primary Treatment

A segregated sewer system is utilized to collect and treat the various waste water streams in the plant. The oily water sewer utilizes raised hubs to collect vessel draws, seal water drainage from pump pads, laboratory drains, cooling water from sample coolers, and various equipment drains. This prevents the processing of large volumes of relatively clean surface drainage through a major portion of the waste water treatment system. However, rainfall within tank dikes in Section 3200 is contained and released to either the clean storm water basin, A-2708, or to the oily water sewer (if contaminated).

The oily water sewer and the overflow from the DAF froth thickener, CL-2703, flow by gravity to the API separator, S-2701. The separator is designed with two identical bays (each capable of handling the total flow). Any free oil present in the waste water is recovered by gravity separation. The recovered oil is manually skimmed from the separator and flows by gravity to an adjacent sump. Any solids settling in the API separator are periodically removed (through a slotted pipe on the bottom of the separator) by a vacuum truck and transferred to the sludge holding tank, TK-2717.

Recovered oil (as an oil/water mixture) from the API separator and from the clean basin floating skimmer, A-2715, is transferred to the slop oil tanks, TK-2701 and TK-2702, by the recovered oil pump, P-2705. Gravity settling in the tanks results in separation of the oil/water mixture. Water from the tanks is periodically withdrawn and returned to the API separator. Both tanks are equipped with heating coils to aid in breaking any oil/water emulsions. After complete separation of the oil and water layers in the tanks, the oil is drained to the recovered oil sump and transferred by P-2705 to the fuel oil storage tank in Section 3200.

The API separator effluent and the effluent from Section 1300 - Ammonia Recovery are combined in the equalization basin, A-2707. Several intermittent streams are also directed

to A-2707. These include filtrate from the belt filter press system, A-2706, backwash from the carbon adsorption system, A-2705, and backwash from the gravity filtration system, D-2720. The equalization basin dampens both flow and contaminant concentration fluctuations to downstream processing. A-2707 provides approximately four days residence time at normal flow rates. Mixing in A-2707 is provided by the equalization basin aeration system, M-2701, and the equalization aeration blower, B-2704. The pH of the equalization basin effluent is controlled by the automatic addition of sulfuric acid and caustic. Caustic is stored in the caustic day drum, D-2701, and pumped on demand by the caustic metering pump, P-2709. Sulfuric acid is stored in the acid day drum, D-2702, and pumped as required by the acid metering pump, P-2710. Under normal conditions, only the addition of sulfuric acid is required. This is due to the use of caustic in the ammonia stripper in Section 1300 - Ammonia Recovery.

### Secondary Treatment

The effluent from the equalization basin is pumped to the dissolved air flotation system, S-2702A/B, using a level-flow control cascade. This control scheme tends to dampen fluctuations in flow to the DAF while maintaining the level in the equalization basin.

The dissolved air flotation (DAF) system is designed to remove suspended solids and oil which interfere with the downstream biological oxidation system. In the flotation process, a portion of the effluent is saturated with air at approximately 60 psig and recycled to the flotation cell. As the pressure of the recycle stream is reduced to near atmospheric, finely dispersed air bubbles are released. Aided by the addition of polymer from the DAF polymer feed system, A-2717, the air bubbles become attached to particles of suspended solids and oil. The resulting particles are less dense and float to the water surface and are skimmed off. The aerated sludge, called froth, is transferred to the DAF froth thickener, CL-2703, by the DAF froth pump, P-2720. The DAF froth thickener provides sufficient residence time for deaeration of the froth. As the suspended solids settle, the clarified water and any free oil overflowing CL-2703 is recycled to the API separator. The thickener sludge and any sludge settling in the flotation cell, is withdrawn on a periodic basis and transferred by the combined sludge pump, P-2727, to the sludge holding tank, TK-2717.

The effluent from the dissolved air flotation unit flows by gravity to the activated sludge unit. The activated sludge process is designed to biologically remove dissolved organic contaminants in the waste water. The process involves contacting the contaminated waste water with a mixed culture of

microorganisms in the aeration basin, A-2707. Waste water from A-2707 flows by gravity to the activated sludge clarifier, CL-2702, where the biologically active sludge settles out. Sludge from the clarifier underflow is recycled to A-2707 by the return sludge pump, P-2711. The level of organisms in the aeration basin is maintained in this manner. Mixing in A-2707 and the oxygen required for the biological reactions are provided by the aeration basin aeration system, M-2703, and the aeration basin blower, B-2706.

In order to increase contaminant removal efficiencies and minimize sludge wastage, the activated sludge unit is operated in an extended aeration mode. Approximately two days residence time in the aeration basin is provided at the normal flow rate. Due to operation in the extended aeration mode, the activated sludge unit is more sensitive to fluctuating feed concentrations. The addition of powdered carbon from the powdered carbon system, A-2723, not only increases the ability of the system to respond to fluctuating feed concentrations, but also reduces the effects of any inhibitory constituents in waste water and increases sludge settling characteristics in the clarifier.

Phosphorous (a mineral nutrient) is essential for successful biological treatment of the waste water. Phosphorous is provided as phosphoric acid which is stored in the nutrient storage drum, D-2703. The phosphoric acid is added to the aeration basin at a controlled rate via the nutrient metering pump, P-2719.

Waste activated sludge from the return sludge pump, P-2711, is directed to the aerobic digestion tank, TK-2718. The wasted sludge is aerobically digested to reduce the sludge disposal volume and enhance the sludge dewatering characteristics. Mixing and oxygen for the biological reactions in TK-2718 is provided by the aerobic digestion aeration system, M-2702, and the aerobic digestion aeration blower, B-2705. The digested sludge settling tank, TK-2719, permits continuous operation of the aerobic digester. Sludge from TK-2719 is recycled by the digested sludge pump, P-2704, to maintain the desired digester operation. Waste digested sludge is transferred by P-2704 to the sludge holding tank, TK-2717. Overflow from TK-2719 is returned to the aeration basin, A-2711. In the event of activated sludge unit failure, the sludge in the aerobic digester, transferred by P-2704, is utilized to reacclimate the system.

### Tertiary Treatment

The overflow from the activated sludge clarifier, CL-2702, is pumped by the filter feed pump, P-2712, on level control through the static polymer mixer, M-2704, to the gravity filtration system, A-2720A/B. The system is designed to reduce the suspended solids level of the waste water prior

to activated carbon treatment. Polymer from the filtration polymer feed system, A-2719, is added upstream of M-2704 to improve the suspended solids removal efficiency. Two multi-media filters, each capable of handling the total flow, are provided. Backwash from the filters is transferred by the spent backwash pump, P-2726, to the equalization basin, A-2707. The filtered effluent from A-2720A/B is pumped by the carbon column feed pump, P-2725, on level control to the carbon adsorption system, A-2705.

The carbon adsorption system is designed to remove non-biodegradable organics from the waste water. A contact adsorption/regeneration service is utilized. A two-stage carbon adsorption system is provided to maximize organic removal efficiency, minimize carbon requirements and provide continual treatment capability. Each adsorber is designed for approximately 40 minutes residence time. During normal operation, the second adsorber guards against organic breakthrough from the first adsorber. However, either adsorber can meet the treatment objectives when the other is off line. Treated water from the treated waste water storage tank, TK-2720, is used to backwash the carbon adsorbers. Water is transferred by the backwash pump, P-2713, through the carbon adsorbers (for the removal of suspended solids) and to the equalization basin, A-2707.

### Evaporation System

The effluent from the carbon adsorption system and the BFW waste water from Section 2000 - Water Treatment and Steam Plant are combined in the evaporator feed tank, TK-2722. The waste water is pumped to the evaporation system, A-2722, by the evaporator feed pump, P-2734.

The evaporation system employs a vapor recompression evaporator to concentrate the dissolved solids in the waste water. Sulfuric acid from D-2702 is pumped by the evaporator conditioning pump, P-2733, to the evaporator conditioning tank on pH control. The pH adjusted waste water is pumped through the evaporation feed preheater to the deaerator. As the waste water enters the deaerator, steam is used to strip carbon dioxide, oxygen and other noncondensibles. The waste water then flows to the evaporator sump where it mixes with the recirculating brine. This concentrated brine stream is continuously recycled to the top of the evaporator. As the brine flows down the inside of the evaporator tubes, a portion of the water is vaporized by steam condensing on the outside of the tubes. The supersaturated brine returns to the sump for recirculation. The newly formed steam is compressed, raising its temperature, and discharged to the shell side of the evaporator. Steam condensing on the outer surfaces of the evaporator tubes is collected at the bottom of the condenser and transferred to the condensate flash drum. The steam produced is used for stripping in the deaer-

ator, and the condensate is pumped through the preheater to the treated waste water storage tank, TK-2720. Concentrated brine is discharged to the brine hold-up tank from the recirculation line. The rate of discharge is controlled to maintain the desired solids concentration in the evaporator sump. The concentrated brine is pumped intermittently to Section 900 - Sulfur Recovery by the brine pump, P-2730.

### Sludge Treatment

The primary and secondary sludges from the waste water treatment system are combined in the sludge holding tank, TK-2717. Since the sludge dewatering facilities operate intermittently, approximately three days storage capacity is provided in TK-2717. The belt filter press feed pump, P-2728, is utilized to transfer the combined sludge to the belt filter press system, A-2706. A portion of the discharge from P-2728 is recycled to TK-2717 to provide mixing and prevent plugging of the pump suction. As the sludge enters A-2706, it is conditioned with polymer from the belt filter press polymer feed system, A-2716. The flocculated solids are discharged to a porous belt where free water is removed. The thickened sludge is then compressed between two porous belts where it is subjected to gradually increasing pressure for the removal of additional water. The sludge is dewatered to approximately 30 weight percent and periodically trucked to an on-site landfill.

### Solid Waste Disposal

A number of solid wastes from the plant require disposal in a landfill. Two separate landfill areas are provided. A conventional landfill is provided for the disposal of slag, raw water treatment sludge, tramp iron, and other non-hazardous waste. A secure landfill is utilized for the disposal of the waste water treatment sludges and soluble salts. The soluble salts are produced in Section 900 - Sulfur Recovery and in the evaporation system, A-2722. The salts are combined in Section 900 and spray dried prior to disposal. Any leachate collected from the secure landfill is recycled to the equalization basin, A-2707.

Contract disposal in a local sanitary landfill is provided for maintenance, cafeteria, and office waste materials.

### Storm Water System

Three separate storm water systems are provided to collect and contain storm water runoff from the plant process areas. Rainwater runoff from Section 100 - Feedstock Preparation is collected in the coal preparation area runoff basin, A-2712. Any coal fines present in the water are allowed to settle out in the basin. The water is transferred from the basin by the coal preparation area basin pump, P-2715, di-

rectly to Section 2400 - Cooling Water. Storm water runoff from relatively dirty process areas (Section 1100 - Gas Liquor Separation, Section 1200 - Phenol Extraction, and a portion of Section 300 - Gasification) is collected and contained within the process areas and treated with the main process (Gas Liquor) waste water stream. Storm water from the remaining process areas of the plant is collected in the clean storm water basin, A-2708. Any free oil present in the storm water is removed by the clean basin floating skimmer, A-2715, and transferred to the recovered oil sump which is located adjacent to the API separator. The storm water collected in A-2708 is pumped by the clean storm water pump, P-2729, to the treated waste water storage tank, TK-2720.

Rainwater runoff from peripheral (nonprocess) areas of the plant is allowed to flow via natural drainage.

### Sanitary Treatment System

Sanitary waste water from lavatories and shower areas throughout the plant is processed in the sanitary treatment system, A-2702. The unit is a self-contained extended aeration system followed by chlorination. Any excess sludge produced is transferred to the aerobic digestion tank, TK-2718. The clarified effluent from the system is pumped by the sanitary effluent pump, P-2731, to the discharge of the treated waste water pump, P-2724. Both streams are recycled to Section 2400 - Cooling Water as make-up.

### Start-up Procedure

The detailed start-up procedure of the various equipment items is subject to the operating instructions issued by the manufacturer. The following start-up sequence is utilized.

During the initial start-up of the waste water treatment system the major waste water streams are the oily water sewer, cooling tower blowdown, BFW waste water, and the sanitary sewer.

The oily water sewer is allowed to flow through S-2701 to A-2707. As oil accumulates in S-2701, it is manually skimmed and transferred to TK-2701. The cooling tower blowdown is allowed to flow through Section 1000 - Slag Handling and Section 1300 - Ammonia Recovery to A-2707. The pH controller in A-2707 is set. P-2709 and P-2710 are placed in service.

As the liquid level in A-2707 rises, B-2704 is started and air is allowed to flow through M-2701. P-2701 is started and flow to S-2702 is initiated. When the flotation cell is filled, the waste water is allowed to overflow to A-2711, the recycle pumps are started, air flow to the saturation



tank is established, and A-2717 is placed in service. As the froth sump is filled, P-2720 is started and the froth is transferred to CL-2703. The clarified water is allowed to overflow CL-2703 to A-2707. Sludge is withdrawn and transferred to TK-2717 as required.

As the liquid level in A-2711 rises, B-2706 is started and the air flow through M-2703 is established. Waste water is allowed to flow from A-2711 to CL-2702. As CL-2702 begins to overflow, P-2711 is started. Activated sludge from a nearby municipal treatment plant is added to A-2711 and allowed to circulate through CL-2702 and P-2711. P-2719 is placed in service, and powdered carbon is added to A-2711 from A-2723 when stable operation is achieved. As waste activated sludge is produced it is transferred to TK-2718. As TK-2718 is filled, B-2705 is started and air flow through M-2702 is established. TK-2718 is allowed to overflow to TK-2719. When TK-2719 begins to overflow to A-2711, P-2704 is started. Waste sludge is transferred to TK-2717 as required. When a level in TK-2717 is established, P-2728, A-2706, and A-2716 are started. The sludge dewatering facilities are operated as required to reduce sludge inventory in TK-2717.

As CL-2702 overflows, P-2712 is started, A-2719 is placed in service, and waste water is pumped through M-2704 to A-2720. Water is passed through the filter to the backwash storage compartment. When the storage compartment overflows, P-2725 is started and waste water is pumped through A-2705 to TK-2722. A-2720 and A-2705 are backwashed as necessary.

The BFW waste water from Section 2000 - Water Treatment and Steam Plant and the effluent from A-2705 are used to fill TK-2722. Waste water from A-2705 is then directed to the emergency hold-up basin, A-2721. As the level in the basin rises, P-2729 is started and recirculation to A-2707 is established.

When TK-2722 is filled, waste water is transferred to the evaporator sump and recirculation is initiated. Seed is injected into the sump using the seed tank and pump. Steam flow to the evaporator is established and the circulating system is brought to normal operating temperature. The system is maintained in this hot condition for approximately 24 hours to allow proper chemical transformation of the seed to take place. During this time, the hot steam condensate from the condenser is recirculated through the preheater by the distillate pump. The system is now ready for operation. The compressor, P-2734, P-2733, and the feed pump are started. When the brine concentration reaches the desired level, waste brine is transferred to the hold-up tank and pumped by P-2730 to Section 900 - Sulfur Recovery. The condensate produced is transferred to TK-2720. As TK-2720 is filled, P-2724 is started and treated waste water is recycled to Section 2400 - Cooling Water.

The sanitary treatment system, A-2702, is started up using sludge from a nearby municipal treatment plant. The system effluent is recycled directly to Section 2400 - Cooling Water.

The entire waste water treatment system is now in operation. As Section 1300 - Ammonia Recovery is started up, the waste water flows are brought to normal operating levels. Recirculation to the emergency hold-up basin is discontinued, and P-2729 is shut down when the basin is emptied.

#### Shutdown Procedure

The waste water treatment system is designed for continuous operation. Sufficient flexibility is incorporated in the design to allow maintenance on specific equipment items without a complete shutdown of the system.

## 18.2 Design Basis for Plant Section 2700

Information concerning the treatability of waste water from coal gasification is limited. The waste water treatment system design is based upon data from the Technical Support Program and literature available on the treatment of phenolic waste waters. Most of the literature is related to the treatment of coke plant effluents while a limited number of articles are related to the processing of coal conversion wastes.

The waste water treatment system is designed to utilize commercially proven (in similar applications) waste water treatment technology. In addition, the system incorporates the use of the "zero discharge" concept to minimize adverse environmental effects.

### Capacity of the Unit

The system is designed to process the various waste water streams at their maximum flow rates.

The capacities of the storm water runoff basins are based upon 25-year frequency rainfall data.

### Flexibility

Due to the limited amount of data and the "zero discharge" requirement, considerable flexibility has been incorporated in the waste water treatment system design. The major features are listed below:

- a) Due to the absence of variability data, a relatively long equalization period (approximately four days) is utilized.
- b) In the event of major spills in process areas the capability of processing contaminated storm water (surface drainage) is provided.
- c) Two dissolved air flotation systems are provided to permit processing at a reduced rate in the event maintenance is required.
- d) The capability of recycling the clarified effluent from the activated sludge unit is provided. This enables dilution of the activated sludge unit feed and provides a means of reducing the concentration of any inhibitory constituents present in the feed.
- e) The aerobic digestion system provides a means of storage for biomass. In the event of activated sludge unit failure, the biomass would be utilized to reseed the activated sludge unit.

- f) Two gravity filtration systems are utilized to provide continuous filtration capability.
- g) A two-stage activated carbon treatment is provided to guard against breakthrough of the first adsorption stage. The system also provides continual treatment capability during carbon replacement operations.
- h) An emergency diversion basin is provided in the event maintenance is required on the evaporation system.

18.3 Material Balance for Plant Section 2700

<u>INPUT</u>	<u>RATE</u> <u>LB/HR</u>
Clean Areas Storm Sewer	16,000
Belt Filter Press Polymer	507
Oily Water Sewer and Tank Dike Drainage	12,500
Ammonia Recovery Effluent	51,664
Sanitary Sewer	7,500
DAF Polymer	501
Sulfuric Acid from Storage	65
Rainwater Runoff	12,000
Powdered Carbon	520
Phosphoric Acid from Storage	6
BFW Wastewater	9,000
Filtration Polymer	501
L.P. Condensate	500
Total Input	111,264
 <u>OUTPUT</u>	
Sludge Trucked to Landfill	130
Rainwater Runoff to Cooling Tower	12,000
Brine to Sulfur Recovery	1,785
Treated Wastewater Recycle	97,325
Slop Oil to Storage	24
Total Output	111,264

## 18.4 STREAM COMPOSITIONS

18.4 Stream Composition For Plant Section 2700

STREAM NUMBER:	2700	2701	2702
STREAM NAME:	CLEAN AREAS STORM SEWER	BELT FILTER PRESS POLYMER	OILY WATER SEWER & TANK DIKE DRAINAGE

TOTAL FLOW

GPM	32	1	25
LB/HR	16,000	507	12,500

PARAMETERS	<u>MG/L</u>	<u>LB/HR</u>	<u>MG/L</u>	<u>LB/HR</u>	<u>MG/L</u>	<u>LB/HR</u>
COD	50	0.8	-	-	285	3.6
BOD <sub>5</sub>	20	0.3	-	-	60	0.8
TOC	20	0.3	-	-	120	1.5
TSS	50	0.8	-	-	500	6.2
TDS	500	8.0	-	-	300	3.8
NH <sub>3</sub> -Free/Fixed	-	-	-	-	-	-
Phenolics	-	-	-	-	-	-
Oil	5	0.1	-	-	2000	25.0
Thiocyanate	-	-	-	-	-	-
Cyanide-Free/Fixed	-	-	-	-	-	-

18.4 Stream Composition For Plant Section 2700 (Continued)

STREAM NUMBER:	(1303) 2703	2704	2705
STREAM NAME:	AMMONIA RECOVERY EFFLUENT	SANITARY SEWER	DAF POLYMER

TOTAL FLOW

	GPM	103		15		1
	LB/HR	51,664		7,500		501
<u>PARAMETERS</u>	<u>MG/L</u>	<u>LB/HR</u>	<u>MG/L</u>	<u>LB/HR</u>	<u>MG/L</u>	<u>LB/HR</u>
COD	1520	78.4	500	2.5	-	-
BOD <sub>5</sub>	950	49	200	1.0	-	-
TOC	775	40	200	1.0	-	-
TSS	105	5.3	200	1.0	-	-
TDS	2820	145.7	200	1.0	-	-
NH <sub>3</sub> -Free/Fixed	23	1.2	15	0.1	-	-
Phenolics	610	31.4	-	-	-	-
Oil	60	3.0	100	0.5	-	-
Thiocyanate	280	14.4	-	-	-	-
Cyanide-Free/Fixed	45	2.3	-	-	-	-



18.4 Stream Composition For Plant Section 2700 (Continued)

STREAM NUMBER:	2706	2707	2708
STREAM NAME:	SULFURIC ACID FROM STORAGE	RAINWATER RUNOFF	POWDERED CARBON
<u>TOTAL FLOW</u>			
GPM	-	24	1
LB/HR	65	12,000	520
<u>PARAMETERS</u>	<u>MG/L</u> <u>LB/HR</u>	<u>MG/L</u> <u>LB/HR</u>	<u>MG/L</u> <u>LB/HR</u>
COD	- -	50 0.6	- -
BOD <sub>5</sub>	- -	20 0.2	- -
TOC	- -	20 0.2	- -
TSS	- -	50 0.6	- -
TDS	- -	500 6.0	- -
NH <sub>3</sub> -Free/Fixed	- -	- -	- -
Phenolics	- -	- -	- -
Oil	- -	- -	- -
Thiocyanate	- -	- -	- -
Cyanide-Free/Fixed	- -	- -	- -

18.4 Stream Composition For Plant Section 2700 (Continued)

STREAM NUMBER:	2709	2710	2711	
STREAM NAME:	PHOSPHORIC ACID FROM STORAGE	REGENERATED GRANULAR CARBON	BFW WASTEWATER	
<u>TOTAL FLOW</u>				
GPM	-	-	18	
LB/HR	6.0	30	9,000	
PARAMETERS	<u>MG/L</u>	<u>LB/HR</u>	<u>MG/L</u>	<u>LB/HR</u>
COD	-	-	-	-
BOD <sub>5</sub>	-	-	-	-
TOC	-	-	-	-
TSS	-	-	-	-
TDS	-	-	11,110	100
NH <sub>3</sub> -Free/Fixed	-	-	-	-
Phenolics	-	-	-	-
Oil	-	-	-	-
Thiocyanate	-	-	-	-
Cyanide-Free/Fixed	-	-	-	-

18.4 Stream Composition For Plant Section 2700 (Continued)

STREAM NUMBER:	2712	2713	2714
STREAM NAME:	FILTRATION POLYMER	SLUDGE TRUCKED TO LANDFILL	RAINWATER RUNOFF TO COOLING TOWER
<u>TOTAL FLOW</u>			
GPM	1	-	24
LB/HR	501	130	12,000
<u>PARAMETERS</u>	<u>MG/L</u> <u>LB/HR</u>	<u>MG/L</u> <u>LB/HR</u>	<u>MG/L</u> <u>LB/HR</u>
COD	- -	- -	50 0.6
BCD <sub>5</sub>	- -	- -	20 0.2
TCC	- -	- -	20 0.2
TSS	- -	300,000 39	50 0.6
TDS	- -	- -	500 6.0
NH <sub>3</sub> -Free/Fixed	- -	- -	- -
Phenolics	- -	- -	- -
Oil	- -	- -	- -
Thiocyanate	- -	- -	- -
Cyanide-Free/Fixed	- -	- -	- -

18.4 Stream Composition For Plant Section 2700 (Continued)

STREAM NUMBER:	2715	(914) 2716	2717	
STREAM NAME:	SPENT GRANULAR CARBON	BRINE TO SULFUR RECOVERY	TREATED WASTEWATER RECYCLE	
<u>TOTAL FLOW</u>				
GPM	-	3	195	
LB/HR	30	1,785	97,325	
PARAMETERS	<u>MG/L</u>	<u>LB/HR</u>	<u>MG/L</u>	<u>LB/HR</u>
COD	-	-	*	*
BOD <sub>5</sub>	-	-	*	*
TOC	-	-	*	*
TSS	-	-	*	*
TDS	-	-	*	*
NH <sub>3</sub> -Free/Fixed	-	-	*	*
Phenolics	-	-	*	*
Oil	-	-	*	*
Thiocyanate	-	-	*	*
Cyanide-Free/Fixed	-	-	*	*

} 372

\*Values Of Contaminents By Equipment Vendor

18.4 Stream Composition For Plant Section 2700 (Continued)

STREAM NUMBER: (3206) 2718  
 STREAM NAME: SLOP OIL TO STORAGE

TOTAL FLOW

GPM -  
 LB/HR 24

PARAMETERS	<u>MG/L</u>	<u>LB/HR</u>
COD	-	-
BOD <sub>5</sub>	-	-
TOC	-	-
TSS	-	-
TDS	-	-
NH <sub>3</sub> -Free/Fixed	-	-
Phenolics	-	-
Oil	-	23.8
Thiocyanate	-	-
Cyanide-Free/Fixed	-	-

18.5 Utility, Catalyst And Chemical Summary For Plant Section 2700

<u>Utility Consumption</u>	<u>Battery Limit Conditions</u>	<u>Units</u>	<u>Normal Demand</u>
Electrical Power		KW	1000
Steam			
Low Pressure	40 psig, 310°F	MLB/HR	0.5
Water			
Service Water	75 psig, AMB.	GPM	3
Air			
Instrument	100 psig, 100°F	SCFM	10
Plant	100 psig, 100°F	SCFM	25
Caustic (20 wt%)		LB/HR	-
Sulfuric Acid (96 wt%)		LB/HR	65
Phosphoric Acid (75 wt%)		LB/HR	6
Polymers		LB/HR	1.9
Powdered Carbon		LB/HR	8.3
Granular Carbon		LB/HR	30

18.6 MAJOR EQUIPMENT AND MACHINERY LIST



**FOSTER WHEELER ENERGY CORP.**  
PROCESS PLANTS DIVISION

CONTRACT: 15-1910  
SECTION: 2700

**EQUIPMENT LIST**

NAME OF UNIT

WASTEWATER TREATMENT

CLIENT: CONOCO/DOE  
LOCATION: Noble County, Ohio


CLASS	ITEM NO.	DESCRIPTION	EFD	REQ'N. NO.	P. O. NO.	REVISION					REV.	
						ORIGINAL	1	2	3	4		5
				DATE	12May80	17Sep80	5 Dec. 80	6Feb. 81				
<u>DRUMS</u>	D-2701	CAUSTIC DAY DRUM	1	1131 A								
	D-2702	ACID DAY DRUM	1	1131 B								
	D-2703	NUTRIENT STORAGE DRUM	2	1131 C								
<u>TANKS</u>	TK-2701	SLOP OIL TANK	6	1141 A								
	TK-2702	SLOP OIL TANK	6	1141 A								
	TK-2707	DELETED	--	---								
	TK-2716	DELETED	--	---						CHANGED TO CL-2703		
	TK-2717	SLUDGE HOLDING TANK	6	2142 B								
	TK-2718	AEROBIC DIGESTION TANK	3	2142 C								
	TK-2719	DIGESTED SLUDGE SETTLING TANK	3	1143 C								
	TK-2720	TREATED WASTEWATER STORAGE TANK	5	2142 D								
	TK-2721	DELETED	--	---								
	TK-2722	EVAPORATOR FEED TANK	5	2142 E								
<u>EXCHANGERS</u>	E-2701	DELETED	--	---								
	E-2702	DELETED	--	---								
<u>PUMPS</u>	P-2701A	EQUALIZATION BASIN PUMP	1	1311 A								
	P-2701B	SPARE FOR P-2701A	1	1311 A								
	P-2704A	DIGESTED SLUDGE PUMP	3	1312 A								
	P-2704B	SPARE FOR P-2704A /C	3	1312 A								
	P-2704C	DIGESTED SLUDGE PUMP	3	1312 A								
	P-2705A	RECOVERED OIL PUMP	6	1311 B								
	P-2705B	SPARE FOR P-2705A	6	1311 B								
	P-2706A	DELETED	--	---								
	P-2706B	DELETED	--	---								
	P-2709A	CAUSTIC METERING PUMP	1	1314 A								
	P-2709B	SPARE FOR P-2709A	1	1314 A								
	P-2710A	ACID METERING PUMP	1	1314 B								
	P-2710B	SPARE FOR P-2710A	1	1314 B								
	P-2711A	RETURN SLUDGE PUMP	2	1313 A								
	P-2711B	SPARE FOR P-2711A	2	1313 A								

24



FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION		CONTRACT: 15-1910 SECTION: 2700		EQUIPMENT LIST			NAME OF UNIT WASTEWATER TREATMENT					PAGE 2 OF 4	
CLIENT: CONOCO/DOE				REVISION		ORIGINAL	1	2	3	4	5		
LOCATION: Noble County, Ohio				DATE		12May80	17Sep80	5Dec80	6 Feb81				
CLASS	ITEM NO.	DESCRIPTION	EFD	REQ'N. NO.	P. O. NO.							REV.	
PUMPS (cont'd)	P-2712A	FILTER FEED PUMP	3	1311 D									
	P-2712B	SPARE FOR P-2712A	3	1311 D									
	P-2713A	BACKWASH PUMP	5	1311 E									
	P-2713B	SPARE FOR P-2713A	5	1311 E									
	P-2715A	COAL PREPARATION AREA BASIN PUMP	1	1311 F									
	P-2715B	SPARE FOR P-2715A	1	1311 F									
	P-2719A	NUTRIENT METERING PUMP	2	1314 C									
	P-2719B	SPARE FOR P-2719A	2	1314 C									
	P-2720A	DAF FROTH PUMP	2	1311 G									
	P-2720B	SPARE FOR P-2720A	2	1311 G									
	P-2724A	TREATED WASTEWATER PUMP	5	1311 H									
	P-2724B	SPARE FOR P-2724A	5	1311 H									
	P-2725A	CARBON COLUMN FEED PUMP	3	1311 J									
	P-2725B	SPARE FOR P-2725A	3	1311 J									
	P-2726A	SPENT BACKWASH PUMP	3	1311 K									
	P-2726B	SPARE FOR P-2726A	3	1311 K									
	P-2727A	COMBINED SLUDGE PUMP	6	1311 L									
	P-2727B	SPARE FOR P-2727A	6	1311 L									
	P-2728A	BELT FILTER PRESS FEED PUMP	6	1312 B									
	P-2728B	SPARE FOR P-2728A	6	1312 B									
	P-2729A	CLEAN STORM WATER PUMP	1	1311 M									
	P-2729B	SPARE FOR P-2729A	1	1311 M									
	P-2730A	DRIVE PUMP	5	1311 N									
	P-2730B	SPARE FOR P-2730A	5	1311 N									
	P-2731A	SANITARY EFFLUENT PUMP	4	1311 P									
	P-2731B	SPARE FOR P-2731A	4	1311 P									
	P-2732A	DELETED											
	P-2732B	DELETED											
	P-2733	EVAPORATOR CONDITIONING PUMP	1	1314 D									
	P-2734A	EVAPORATOR FEED PUMP	5	1311 R									
	P-2734B	SPARE FOR P-2734A	5	1311 R									
	BLOWERS	B-2704	EQUALIZATION AERATION BLOWER	2	1942 B								
B-2705		AEROBIC DIGESTION AERATION BLOWER	2	1942 B									
B-2706		AERATION BASIN BLOWER	2	1942 B									
B-2707		COMMON SPARE FOR B-2704/5/6	2	1942 B									
FEEDERS	FD-2701	DELETED									PART OF A-2723		

25

 <b>FOSTER WHEELER ENERGY CORP.</b> PROCESS PLANTS DIVISION		CONTRACT: 15-1910 SECTION: 2700	<b>EQUIPMENT LIST</b>			NAME OF UNIT WASTEWATER TREATMENT					PAGE 3 OF 4
CLIENT: CONOCO/DOE			REVISION	ORIGINAL	1	2	3	4	5	REV.	
LOCATION: Noble County, Ohio			DATE	12May80	17Sep80	5Dec80	6 Feb. 81				
CLASS	ITEM NO.	DESCRIPTION	EFD	REQ'N. NO.	P. O. NO.						
<u>CLARIFIERS</u>	CL-2702	ACTIVATED SLUDGE CLAFIFIER	2	1942 A							
	CL-2703	DAF FROTH THICKENER	6	1942 P							
<u>EDUCTORS</u>	J-2701	DELETED								PART OF A-2723	
<u>FILTERS</u>	F-2701	DELETED								PART OF A-2723	
<u>MIXERS</u>	M-2701	EQUALIZATION AERATION SYSTEM	1	1942 B							
	M-2702	AEROBIC DIGESTION AERATION SYSTEM	3	1942 B							
	M-2703	AERATION BASIN AERATION SYSTEM	2	1942 B							
	M-2704	STATIC POLYMER MIXER	3	1942 E							
<u>SEPARATORS</u>	S-2701	API SEPARATOR	1	1942 F							
	S-2702A	DISSOLVED AIR FLOTATION SYSTEM	2	1942 G							
	S-2702B	DISSOLVED AIR FLOTATION SYSTEM	2	1942 G							
<u>PACKAGE UNITS</u>	A-2702	SANITARY TREATMENT SYSTEM	4	1944 A							
	A-2705	CARBON ADSORPTION SYSTEM	4	1942 H							
	A-2706	BELT FILTER PRESS SYSTEM	6	1942 J							
	A-2707	EQUALIZATION BASIN	1	---							
	A-2708	CLEAN STORM WATER BASIN	4	---							
	A-2711	AERATION BASIN	2	---							
	A-2712	COAL PREPARATION AREA RUNOFF BASIN	1	---							
	A-2715	CLEAN BASIN FLOATING SKIMMER	4	1942 K							
	A-2716	BELT FILTER PRESS POLYMER FEED SYS.	6	1942 N							
A-2717	DAF POLYMER FEED SYSTEM	2	1942 N								
A-2719	FILTRATION POLYMER FEED SYSTEM	3	1942 N								



**FOSTER WHEELER ENERGY CORP.**  
PROCESS PLANTS DIVISION

CONTRACT: 15-1910  
SECTION: 2700

**EQUIPMENT LIST**

NAME OF UNIT  
WASTEWATER TREATMENT  
PAGE 4 OF 4

CLIENT: CONOCO/DOE  
LOCATION: Noble County, Ohio  
REVISION: ORIGINAL  
DATE: 12May80, 17Sep80, 5Dec80, 6 Feb81

CLASS	ITEM NO.	DESCRIPTION	EFD	REQ'N. NO.	P. O. NO.	REVISION					REV.
						1	2	3	4	5	
PACKAGE UNITS (cont'd)	A-2720A	GRAVITY FILTRATION SYSTEM	3	1942 L							
	A-2720B	GRAVITY FILTRATION SYSTEM	3	1942 L							
	A-2721	EMERGENCY HOLD-UP BASIN	4	----							
	A-2722	EVAPORATION SYSTEM	5	1942 M							
	A-2723	POWDERED CARBON SYSTEM	2	1369 A							
MOTORS	PM-2713A	MOTOR FOR P-2713A	5	1381A							
	PM-2713B	MOTOR FOR P-2713B	5	1381A							
	PM-2724A	MOTOR FOR P-2724A	5	1381A							
	PM-2724B	MOTOR FOR P-2724B	5	1381A							
	PM-2730A	MOTOR FOR P-2730A	5	1381A							
	PM-2730B	MOTOR FOR P-2730B	5	1381A							
	PM-2734A	MOTOR FOR P-2734A	5	1381A							
	PM-2734B	MOTOR FOR P-2734B	5	1381A							

27

18.7 MAJOR EQUIPMENT AND MACHINERY REQUISITIONS (DATA SHEETS)

The following Major Equipment and Machinery Requisitions (Data Sheets) are included in this section:

Drums

<u>Item No.</u>	<u>Drawing No.</u>	<u>Description</u>
D-2701	1910-4-13-27001	Caustic Day Drum
D-2702	1910-4-13-27002	Acid Day Drum
D-2703	1910-4-13-27003	Nutrient Storage Drum

Tanks

<u>Item No.</u>	<u>Drawing No.</u>	<u>Description</u>
TK-2701	1910-4-14-27004	Slop Oil Tank
TK-2702	1910-4-14-27004	Slop Oil Tank
TK-2717	1910-4-14-27007	Sludge Holding Tank
TK-2718	1910-4-14-27008	Aerobic Digestion Tank
TK-2719	1910-4-14-27009	Digested Sludge Settling Tank
TK-2720	1910-4-14-27005	Treated Wastewater Storage Tank
TK-2722	1910-4-14-27010	Evaporator Feed Tank

Machinery

<u>Item No.</u>	<u>Requisition No.</u>	<u>Description</u>
P-2701A/B	27-1910-1311A	Equalization Basin Pump & Spare
P-2704A/B/C	27-1910-1312A	Digested Sludge Pumps & Spare
P-2705A/B	27-1910-1311B	Recovered Oil Pump & Spare
P-2709A/B	27-1910-1314A	Caustic Metering Pump & Spare
P-2710A/B	27-1910-1314B	Acid Metering Pump & Spare
P-2711A/B	27-1910-1313A	Return Sludge Pump & Spare
P-2712A/B	27-1910-1311D	Filter Feed Pump & Spare
P-2713A/B	27-1910-1311E	Backwash Pump & Spare
P-2715A/B	27-1910-1311F	Coal Preparation Area Basin Pump & Spare
P-2719A/B	27-1910-1314C	Nutrient Metering Pump & Spare
P-2720A/B	27-1910-1311G	DAF Froth Pump & Spare
P-2724A/B	27-1910-1311H	Treated Wastewater Pump & Spare

## 18.7 (Cont'd)

Machinery (Cont'd)

<u>Item No.</u>	<u>Requisition No.</u>	<u>Description</u>
P-2725A/B	27-1910-1311J	Carbon Column Feed Pump & Spare
P-2726A/B	27-1910-1311K	Spent Backwash Pump & Spare
P-2727A/B	27-1910-1311L	Combined Sludge Pump & Spare
P-2728A/B	27-1910-1312B	Belt Filter Press Feed Pump & Spare
P-2729A/B	27-1910-1311M	Clean Storm Water Pump & Spare
P-2730A/B	27-1910-1311N	Brine Pump & Spare
P-2731A/B	27-1910-1311P	Sanitary Effluent Pump & Spare
P-2733	27-1910-1314D	Evaporator Conditioning Pump
P-2734A/B	27-1910-1311R	Evaporator Feed Pump & Spare
B-2704	See M-2701	---
B-2705	See M-2702	---
B-2706	See M-2703	---
B-2707	See M-2701	---
PM-2713A/B	27-1910-1381A	Motors for P-2713A/B
PM-2724A/B	27-1910-1381A	Motors for P-2724A/B
PM-2730A/B	27-1910-1381A	Motors for P-2730A/B
PM-2734A/B	27-1910-1381A	Motors for P-2734A/B

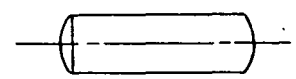
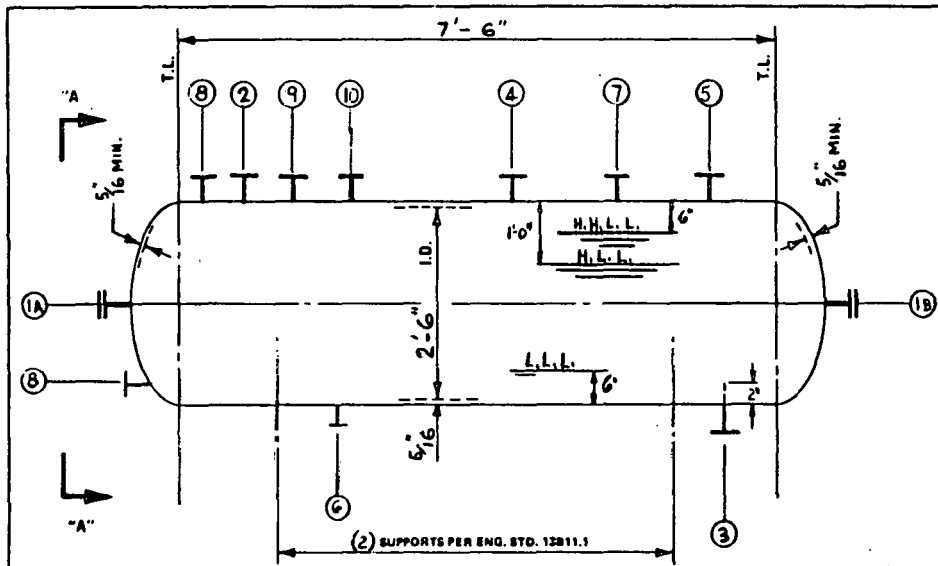
Miscellaneous Equipment

<u>Item No.</u>	<u>Requisition No.</u>	<u>Description</u>
CL-2702	27-1910-1942A	Activated Sludge Clarifier
CL-2703	27-1910-1942P	DAF Froth Thickener
M-2701	27-1910-1942B	Equalization Aeration System
M-2702	27-1910-1942B	Aerobic Digestion Aeration System
M-2703	27-1910-1942B	Aeration Basin Aeration System
M-2704	27-1910-1942E	Static Polymer Mixer
S-2701	27-1910-1942F	API Separator
S-2702A/B	27-1910-1942G	Dissolved Air Flotation Systems
A-2702	27-1910-1944A	Sanitary Treatment System
A-2705	27-1910-1942H	Carbon Adsorption System
A-2706	27-1910-1942J	Belt Filter Press System

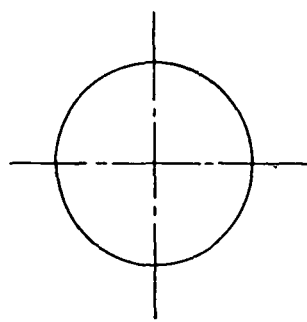
18.7 (Cont'd)

Miscellaneous Equipment (Cont'd)

<u>Item No.</u>	<u>Requisition No.</u>	<u>Description</u>
A-2715	27-1910-1942K	Clean Basin Floating Skimmer
A-2716	27-1910-1942N	Belt Filter Press Polymer Feed System
A-2717	27-1910-1942N	DAF Polymer Feed System
A-2719	27-1910-1942N	Filtration Polymer Feed System
A-2720A/B	27-1910-1942L	Gravity Filtration System
A-2722	27-1910-1942M	Evaporation System
A-2723	27-1910-1369A	Powdered Carbon System



ORIENTATION PLAN



VIEW "A-A"

- NOTES:**
1. VESSEL FABRICATOR TO SUPPLY AND INSTALL (AS MARKED).  
 [ ] PLATFORM AND LADDER ATTACHMENTS  
 [ ] PIPE SUPPORTS
  2. STEAM TRACINGS AND INSULATION BY R.W.E.C.

DEPARTMENT OF ENERGY  
 COAL CONVERSION DIVISION  
 WASHINGTON, D.C.

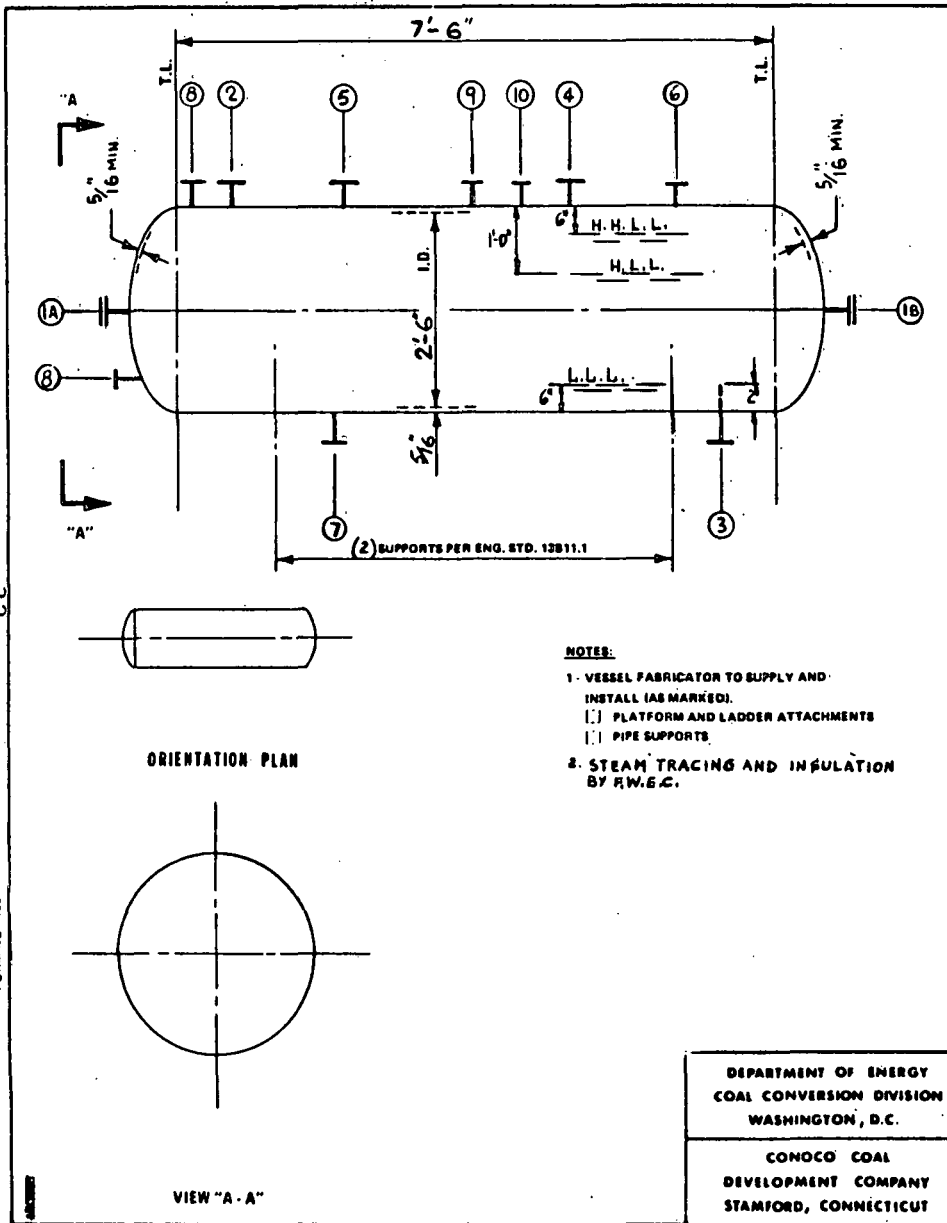
CONOCO COAL  
 DEVELOPMENT COMPANY  
 STAMFORD, CONNECTICUT

RELEASES				VESSEL DATA			
DWG. REV.	DATE	ISSUED FOR		1	ITEM NO. <b>D-2701</b> NO. REQ'D: <b>1</b>		
		PURCHASE SHELL AND HEAD MATERIAL PREPARED BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.		2	SERVICE: <b>CAUSTIC STORAGE</b>		
		ISSUE CHECKED FOSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION		3			
		FIELD CONSTRUCTION		4	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: <b>0</b>	PSIG
				5	MAX: <b>0</b>	PSIG	
				6	DESIGN PRESSURE	INT: <b>16</b>	PSIG
				7	EXT: <b>0</b>	PSIG	
				8	OPER. LIQUID HOLD-UP PRESS. <b>1</b> PSIG		
				9	OPER. PRESS. DROP THRU VESSEL: <b>0</b> PSIG		
				10	MAX. RELIEVING PRESS. AT THE TOP HD: <b>0</b> PSIG		
				11	MAX. OPER. TEMPERATURE: <b>AMB</b>		
				12	DESIGN TEMPERATURE: <b>100°F</b>		
				13	SPECIFIC GRAVITY (PROCESS FLUID): <b>1.2 @ 60°F</b>		
				14	WIND DATA: <b>PER 1910-40A1</b>		
				15			
				16	EARTHQUAKE DATA: <b>PER 1910-40A1</b>		
				17	CODE: <b>ASME VIII, DIV 1 STAMPED: YES</b>		
				18	P.W.M.T. FOR CODE: <b>NO FOR PROCESS: NO</b>		
				19	RADIOGRAPHED: <b>SPOT</b>		
				20	JOINT EFFICIENCY: <b>85%</b>		
				21	CORROSION ALLOW. <b>PER 1910-40A1</b> <b>1/8"</b>		
				22	MAT'L SHELL: <b>SA-285-C</b>		
				23	MAT'L HEADS: <b>SA-285-C</b>		
				24	MAT'L SUPPORTS: <b>SA-285-C</b>		
				25	MAT'L FLANGES: <b>PER 1910-10A1</b>		
				26	MAT'L NOZZLES: <b>PER 1910-10A1</b>		
				27	EXTERNAL BOLTING: <b>SA-193B7/194-2H</b>		
				28	INTERNAL BOLTING: <b>SA-193B7/194-2H</b>		
				29	GASKETS: <b>S.S. SPIRAL WOUND ASB FULL CD</b>		
				30	TYPE OF HEADS: <b>2:1 ELLIPSOIDAL</b>		
				31	INSULATION: <b>YES (SEE NOTE #2)</b>		
				32	PAINT: <b>PREPARATION PER 1910-83A1</b>		
				33	PRIMER: <b>---</b>		
				34	COATS: <b>---</b>		
				35	PARTS: <b>---</b>		
				36	SHIPMENT: <b>ONE PIECE</b>		
				37			
				38	EMPTY WGT:	<b>1450</b>	LBS.
				39	WATER ONLY WGT:	<b>2550</b>	LBS.
				40	INSULATION WGT:	<b>200</b>	LBS.
				41	BUMITE WGT:	<b>---</b>	LBS.
				42	OPER. LIQUID WGT:	<b>---</b>	LBS.
				43			
				44			
NOZZLE CHART							
CONN. NO.	SIZE	ANSI RATING	SERVICE	NO. REQ'D			
1	8"	150# RF	HANDHOLE W/ COVER	2			
2	1 1/2"		CAUSTIC INLET	1			
3	1 1/2"		CAUSTIC OUTLET	1			
4	2"		VENT/OVERFLOW	1			
5	2"		LT/LT/LAH/LAL	1			
6	2"		DRAIN	1			
7	2"		TCV	1			
8	2"		LG/LSHH	2			
9	1 1/2"		TG	1			
10	1 1/2"		TT	1			
REVISIONS							
2	2/2/81	C.S.	REV. PER TASK VI CONSISTENCY REVIEW				
1	9/2/80	C.B.	REVISED PER CUST. COMMENTS				
REV.	DATE	BY	DESCRIPTION				
FOSTER WHEELER ENERGY CORPORATION 110 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY				PIPELINE GAS DEMONSTRATION PLANT NOBLE COUNTY, OHIO CONTRACT No. EF-77-C-01-2542			
REFERENCE DRAWINGS, REQUISITIONS, STANDARDS 1910-10A1, 1910-83A1, 1910-13B11.1, 1910-1100A, 1910-13B11.2,				DRAWN	D. P.	CONTRACT NUMBER <b>15-1910</b>	
				CHECKED		REQUISITION NUMBER <b>27-1910-1131-A</b>	
				APPROVED		P.O. NUMBER	
CAUSTIC DAY DRUM <b>D-2701</b>				DRAWING NUMBER <b>1910-4-13-27001</b>			
WASTEWATER TREATMENT (SECTION 2700)				REV. <b>2</b>			
PIPELINE GAS DEMONSTRATION PLANT				OHIO			
NOBLE COUNTY, OHIO							

31

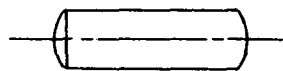
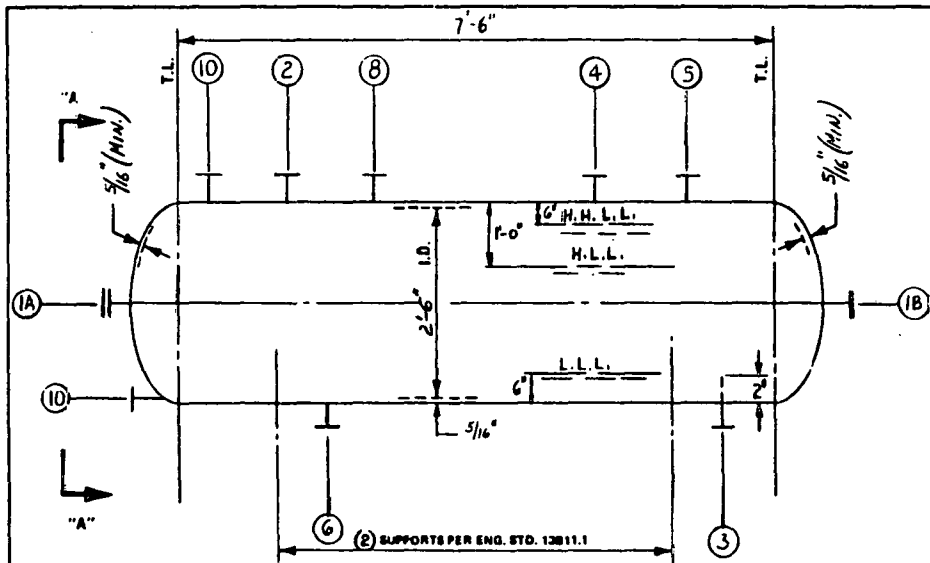
FORM NO. 131

FORM NO. 135 32



RELEASES				VESSEL DATA																																																																																		
1	DATE	ISSUED FOR	1	ITEM NO.	D-2702 NO. RECD: 1																																																																																	
2	DATE OF ORDER	PURCHASE SHELL AND HEAD MATERIALS. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.	2	SERVICE:	SULFURIC ACID STORAGE																																																																																	
3		ISSUE CHECKED FOSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS. FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.	3	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: ATM. PSIG MAX: PSIG																																																																																	
4		FIELD CONSTRUCTION.	4	DESIGN PRESSURE	INT: 16 PSIG EXT: PSIG																																																																																	
NOZZLE CHART			5	OPER. LIQUID HOLD-UP PRESS.	1.6 PSIG																																																																																	
CON. NO.	SIZE	ANSI RATING	SERVICE	NO. REQ'D																																																																																		
1	8"	150# RF	HANDHOLE W/ COVER	2	OPER. PRESS. DROP THRU VESSEL: PSIG																																																																																	
2	2"		ACID INLET	1	MAX. RELIEVING PRESS. AT THE TOP HD: PSIG																																																																																	
3	1 1/2"		ACID OUTLET	1	MAX. OPER. TEMPERATURE: AMB																																																																																	
4	2"		VENT/OVERFLOW	1	DESIGN TEMPERATURE: 100°F																																																																																	
5	2"		LT, LI	1	SPECIFIC GRAVITY (PROCESS FLUID): 1.8 @ 60°F																																																																																	
6	2"		TCV	1	WIND DATA: PER 1910-40A1																																																																																	
7	2"		DRAIN	1																																																																																		
8	2"		LG/LSHH	2	15																																																																																	
9	1 1/2"		TT	1	16 EARTHQUAKE DATA: PER 1910-40A1																																																																																	
10	1 1/2"		TG	1	17 CODE: ASME VIII, DIV 1 STAMPED: YES																																																																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>18</td> <td>P.W.M.T. FOR CODE: NO</td> <td>FOR PROCESS: NO</td> </tr> <tr> <td>19</td> <td>RADIOGRAPHED:</td> <td>SPOT</td> </tr> <tr> <td>20</td> <td>JOINT EFFICIENCY:</td> <td>85%</td> </tr> <tr> <td>21</td> <td>CORROSION ALLOW:</td> <td>1/4"</td> </tr> <tr> <td>22</td> <td>MAT'L SHELL:</td> <td>SA-285-C</td> </tr> <tr> <td>23</td> <td>MAT'L HEADS:</td> <td>SA-285-C</td> </tr> <tr> <td>24</td> <td>MAT'L SUPPORTS:</td> <td>SA-283-C</td> </tr> <tr> <td>25</td> <td>MAT'L FLANGES:</td> <td>PER 1910-10A1</td> </tr> <tr> <td>26</td> <td>MAT'L NOZZLES:</td> <td>PER 1910-10A1</td> </tr> <tr> <td>27</td> <td>EXTERNAL BOLTING:</td> <td>SA-193 B7/19A-2H</td> </tr> <tr> <td>28</td> <td>INTERNAL BOLTING:</td> <td></td> </tr> <tr> <td>29</td> <td>GASKETS:</td> <td>S.S. SPIRAL WOUND ASA, FILLED</td> </tr> <tr> <td>30</td> <td>TYPE OF HEADS:</td> <td>2:1 ELLIPSOIDAL</td> </tr> <tr> <td>31</td> <td>INSULATION:</td> <td>NOTE 2</td> </tr> <tr> <td>32</td> <td>PAINT: PREPARATION:</td> <td>PER 1910-83 A1</td> </tr> <tr> <td>33</td> <td>PRIMER:</td> <td></td> </tr> <tr> <td>34</td> <td>COATS:</td> <td></td> </tr> <tr> <td>35</td> <td>PARTS:</td> <td>SUPPORTS ONLY</td> </tr> <tr> <td>36</td> <td>SHIPMENT:</td> <td>ONE PIECE</td> </tr> <tr> <td>37</td> <td></td> <td></td> </tr> <tr> <td>38</td> <td>EMPTY WGT:</td> <td>1500 LBS</td> </tr> <tr> <td>39</td> <td>WATER ONLY WGT:</td> <td>2550 LBS</td> </tr> <tr> <td>40</td> <td>INSULATION WGT:</td> <td>200 LBS</td> </tr> <tr> <td>41</td> <td>BUNITE WGT:</td> <td>LBS</td> </tr> <tr> <td>42</td> <td>OPER. LIQUID WGT:</td> <td>LBS</td> </tr> <tr> <td>43</td> <td></td> <td></td> </tr> <tr> <td>44</td> <td></td> <td></td> </tr> </table>						18	P.W.M.T. FOR CODE: NO	FOR PROCESS: NO	19	RADIOGRAPHED:	SPOT	20	JOINT EFFICIENCY:	85%	21	CORROSION ALLOW:	1/4"	22	MAT'L SHELL:	SA-285-C	23	MAT'L HEADS:	SA-285-C	24	MAT'L SUPPORTS:	SA-283-C	25	MAT'L FLANGES:	PER 1910-10A1	26	MAT'L NOZZLES:	PER 1910-10A1	27	EXTERNAL BOLTING:	SA-193 B7/19A-2H	28	INTERNAL BOLTING:		29	GASKETS:	S.S. SPIRAL WOUND ASA, FILLED	30	TYPE OF HEADS:	2:1 ELLIPSOIDAL	31	INSULATION:	NOTE 2	32	PAINT: PREPARATION:	PER 1910-83 A1	33	PRIMER:		34	COATS:		35	PARTS:	SUPPORTS ONLY	36	SHIPMENT:	ONE PIECE	37			38	EMPTY WGT:	1500 LBS	39	WATER ONLY WGT:	2550 LBS	40	INSULATION WGT:	200 LBS	41	BUNITE WGT:	LBS	42	OPER. LIQUID WGT:	LBS	43			44		
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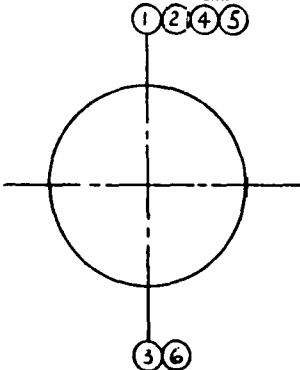




**NOTES:**

- 1. VESSEL FABRICATOR TO SUPPLY AND INSTALL (AS MARKED).
- ( ) PLATFORM AND LADDER ATTACHMENTS
- ( ) PIPE SUPPORTS

**ORIENTATION PLAN**



VIEW "A-A"

DEPARTMENT OF ENERGY  
COAL CONVERSION DIVISION  
WASHINGTON, D.C.

CONOCO COAL  
DEVELOPMENT COMPANY  
STAMFORD, CONNECTICUT

RELEASES		
DWG. REV.	DATE	ISSUED FOR
		PURCHASE SHELL AND HEAD MATERIAL PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.
		ISSUE CHECKED FOSTER WHEELER DRAWING, PURCHASE ALL OTHER MATERIALS, FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.
FIELD CONSTRUCTION		

NOZZLE CHART				
CONN. NO.	SIZE	ANSI RATING	SERVICE	NO. REQ'D
1	8"	150# R.F.	HANDHOLES W/COVER	2
2	1 1/2"		ACID INLET	1
3	1 1/2"		ACID OUTLET	1
4	1 1/2"		VENT / OVERFLOW	1
5	2"		LT, LI	1
6	2"		DRAIN	1
7				
8	1 1/2"		TG	1
9				
10	2"		LG/LSHH	2

REV.	DATE	BY	DESCRIPTION
2	2/1/81	C.S.	REV. PERTASKY/CONSISTENCY REVIEW
1	7/12/80	C.S.	REVISED PER CUSTOM. COMMENTS

VESSEL DATA	
1	ITEM NO. D-2703 NO. REQ'D: 1
2	SERVICE: NUTRIENT STORAGE (PHOSPHORIC ACID)
4	OPER. PRESSURE ABOVE LIQUID LEVEL: NORM: ATM, PSIG
5	MAX: PSIG
6	DESIGN PRESSURE: INT: 16, PSIG
7	EXT: PSIG
8	OPER. LIQUID HOLD UP PRESS.: 1.9, PSIG
9	OPER. PRESS DROP THRU VESSEL: PSIG
10	MAX. RELIEVING PRESS. AT THE TOP HD: PSIG
11	MAX. OPER. TEMPERATURE: AMB.
12	DESIGN TEMPERATURE: 100°F
13	SPECIFIC GRAVITY (PROCESS FLUID): 1.70 @ 60°F
14	WIND DATA:
15	
16	EARTHQUAKE DATA:
17	CODE: ASME VIII SEC. I STAMPED: YES
18	P.W.M.T. FOR CODE: NO FOR PROCESS: NO
19	RADIOGRAPHED: SPOT
20	JOINT EFFICIENCY: 85%
21	CORROSION ALLOW: 1/8"
22	MAT'L SHELL: SA-316 L5 S.
23	MAT'L HEADS: SA-316 L5 S.
24	MAT'L SUPPORTS: SA-283
25	MAT'L FLANGES: PER SPEC 1910-10A1
26	MAT'L NOZZLES: PER SPEC 1910-10A1
27	EXTERNAL BOLTING: A-193 GR.B/193-&H
28	INTERNAL BOLTING:
29	GASKETS: 1/2" S.S. SPIRAL WOUND ASBESTOS
30	TYPE OF HEADS: 2:1 ELLIPSOIDAL
31	INSULATION: NONE
32	PAINT: PREPARATION PER SPEC. 1910-83A1
33	PRIMER:
34	COATS:
35	PARTS: WHOLE
36	SHIPMENT: ONE PIECE
37	
38	EMPTY WGT: 2200 LBS
39	WATER (ONLY) WGT: 3200 LBS
40	INSULATION WGT: LBS
41	SUNITE WGT: LBS
42	OPER. LIQUID WGT: 5400 LBS
43	
44	



FOSTER WHEELER ENERGY CORPORATION  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NEW JERSEY

PIPELINE GAS DEMONSTRATION PLANT  
NOBLE COUNTY, OHIO

CONTRACT No. EF-77-C-01-2542

REFERENCE DRAWINGS, REQUIREMENTS, STANDARDS  
1910-83A1; 1910-10A1; 1910-1100A; 1910-13811.1;  
1910-10B B.2 1910-10B A.1; 50AL,

DRAWN	C.S.	8/4/80
CHECKED		
APPROVED		

CONTRACT NUMBER  
15-1910

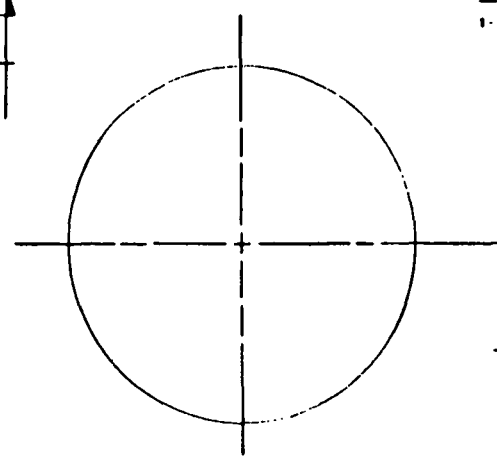
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27-1910-1131-C

P.O. NUMBER

DRAWING NUMBER  
1910-4-13-27003

REV.  
2

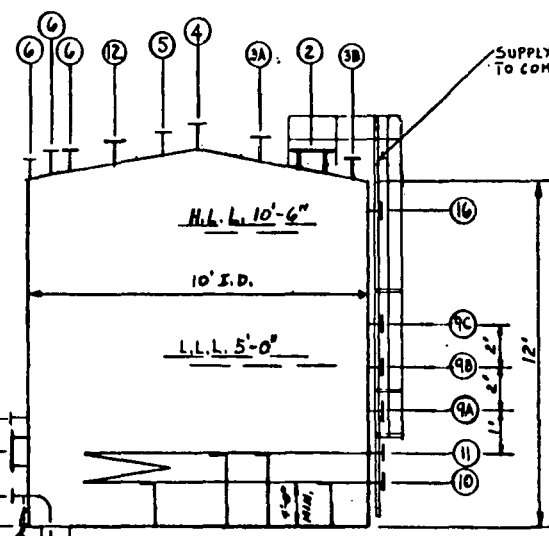
NUTRIENT STORAGE DRUM D-2703  
WASTEWATER TREATMENT (SECTION 2700)  
PIPELINE GAS DEMONSTRATION PLANT  
NOBLE COUNTY OHIO



- NOTES**
- 1 - VESSEL FABRICATOR TO SUPPLY AND INSTALL (AS MARKED)
  - INSULATION ATTACHMENTS
  - PLATFORM AND LADDER ATTACHMENTS
  - PIPE SUPPORTS

**NOTE: PROVIDE A MINIMUM OF 45 FT. OF 2" SCH. 40 PIPE. STEAM IS LOW PRESSURE**

DESIGN PRESSURE 65 PSIG  
DESIGN TEMPERATURE 390 °F



SUPPLY CAGE LADDER PLATFORM TO COMPLY WITH OSHA REGULATIONS.

34

RELEASES		
ISS. REV.	DATE	ISSUED FOR
	DATE OF ORDER	PURCHASE SHELL AND HEAD MATERIAL. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.
		ISSUE CHECKED FOSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS. FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.
FIELD CONSTRUCTION		

VESSEL DATA		
1	ITEM NO:	TK-2701/2 NO REQ: 2
2	SERVICE:	SLOP OIL TANK
3		
4	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: ATM. PSIG
5		MAX: --- PSIG
6	DESIGN PRESSURE	INT: 6" H <sub>2</sub> O PSIG
7		EXT: 6" H <sub>2</sub> O PSIG
8	OPER. LIQUID HOLD-UP PRESS:	5 PSIG
9	OPER. PRESS. DROP THRU VESSEL:	NIL. PSIG
10	MAX. RELIEVING PRESS AT TOP HD.	6" H <sub>2</sub> O
11	MAX. OPER. TEMPERATURE:	180 °F
12	DESIGN TEMPERATURE:	200 °F
13	SPECIFIC GRAVITY PROCESS FLUID:	0.95-1.0
14	WIND DATA:	PER 1910-40A1
15		
16	EARTHQUAKE DATA:	PER 1910-40A1
17	CODE:	API-650 STAMPED AD
18	P.W.H.T. FOR CODE:	NO FOR PROCESS: NO
19	RADIOGRAPHED:	SPOT
20	JOINT EFFICIENCY:	85%
21	CORROSION ALLOW:	1/8" S; 1/4" H;
22	MAT'L SHELL:	SA-283 GR-C
23	MAT'L HEADS:	SA-283 GR-C
24	MAT'L SUPPORTS:	SA-283 GR-C
25	MAT'L FLANGES:	PER API-650 AS APPLIC
26	MAT'L NOZZLES:	PER API-650 AS APPLIC.
27	EXTERNAL BOLTING:	PER A193 GR B7/A194 GR
28	INTERNAL BOLTING:	2HNUTS
29	GASKETS:	1/2" S.S. SPIRAL WOUND GASKET
30	TYPE OF HEAD:	CONICAL TOP / FLAT BOT.
31	INSULATION:	YES BY OTHERS IN FIELD
32	PAINT PREPARATION:	PER SPEC. 1910-03A1
33	PRIMER:	
34	COATS:	
35	PARTS:	WHOLE
36	SHIPMENT:	ONE PIECE
37		
38	EMPTY WGT:	13000 LBS.
39	WATER (ONLY) WGT:	10500 LBS.
40	INSULATION WGT:	1200 LBS.
41	GUNITE WGT:	LBS.
42	OPER. LIQUID WGT:	67000 LBS.
43		
44		

NOZZLE CHART				
CONC. NO.	SIZE	ANSI RATING	SERVICE	NO. REQ'D
1	20"	API-650	MANWAY	1
2	20"	API-650	MANWAY/ENER. VENT	1
3	1 1/2"	ISO R.F.	PURGE INLET (NITROGEN)	2
4	2"		VENT	1
5	3"		PRESSURE/VACUUM REL.	1
6	1 1/2"		LT/LT (TAPE TYPE)	3
7	1 1/2"		TT/TI	1
8	1 1/2"		TG	1
9	4"		OUTLET/INLET	3
10	2"		CONDENSATE OUTLET	1
11	2"		STEAM INLET	1
12	8"		GAUGE HATCH	1
13	3"		DRAIN	1
14	2"		TCV	1
15				
16	4"		OVERFLOW	1

2	1/9/01	C.S.	REV. PER TASK	CONSISTENCY REVIEW
1	4/12/00	C.S.	REVISED PER PROJECT COMM.	
REV. DATE	BY	DESCRIPTION		

<p><b>FOSTER WHEELER ENERGY CORPORATION</b> 118 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY</p>	<p><b>PIPELINE GAS DEMONSTRATION PLANT</b> NOBLE COUNTY, OHIO CONTRACT No. EF-77-C-01-2542</p>	
	<p>REFERENCE DRAWINGS, REGULATIONS, STANDARDS 1910-83A1, 1910-14A1, 1910-40A1, 1910-80A1, API-650 (AS APPLIC.)</p>	<p>DRAWN C.S. 10/3/02</p> <p>CHECKED</p> <p>APPROVED</p>

DEPARTMENT OF ENERGY  
COAL CONVERSION DIVISION  
WASHINGTON, D.C.

CONOCO COAL  
DEVELOPMENT COMPANY  
STAMFORD, CONNECTICUT

**SLOP OIL TANKS (TK-2701/TK-2702)**  
**WASTEWATER TREATMENT (SEC. 2700)**  
**PIPELINE GAS DEMONSTRATION PLANT**  
CONOCO/DOE NOBLE COUNTY, OHIO

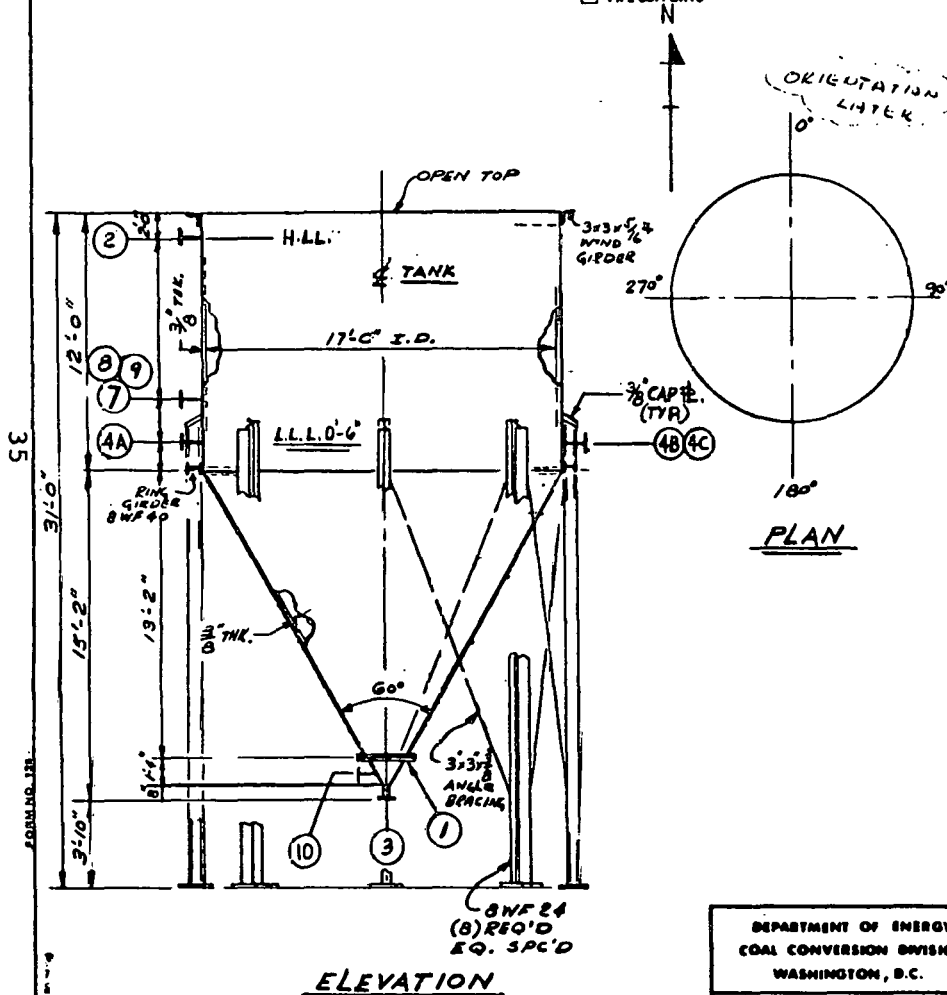
DRAWING NUMBER  
1910-4-14-2701-2

REV.  
2

2.) STEAM TRACING AND INSULATION BY FWEC.

NOTES

- 1. VESSEL FABRICATOR TO SUPPLY AND INSTALL (AS MARKED):
- INSULATION ATTACHMENTS
- PLATFORM AND LADDER ATTACHMENTS
- PIPE SUPPORTS

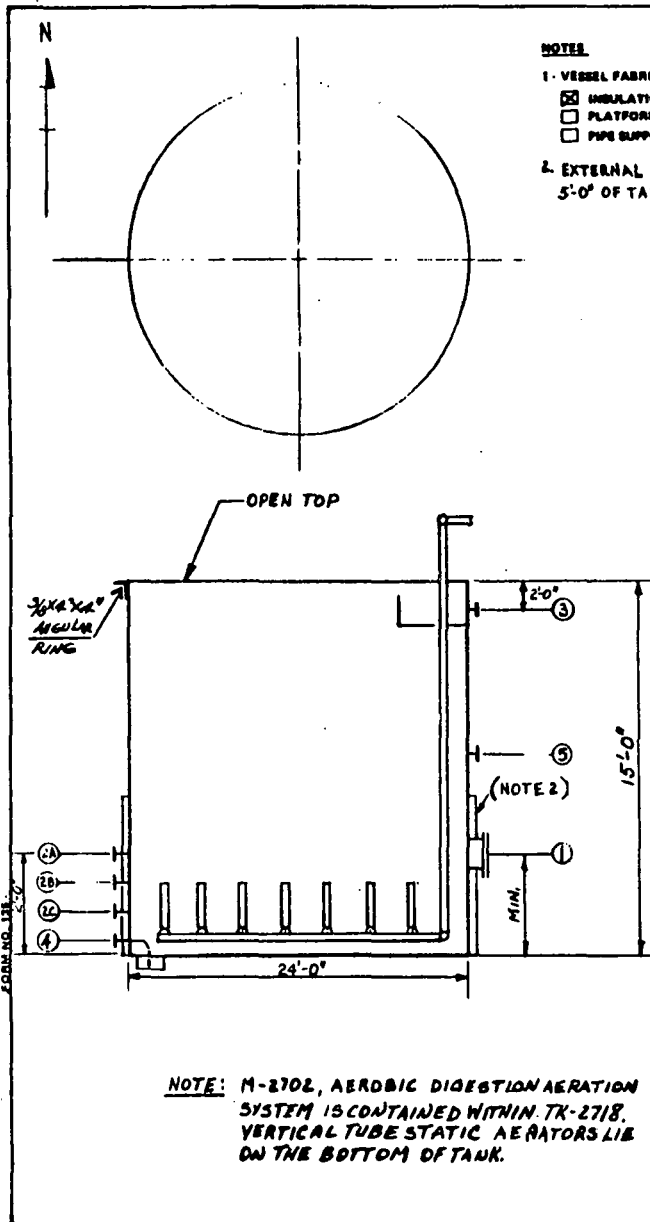


ELEVATION

DEPARTMENT OF ENERGY  
COAL CONVERSION DIVISION  
WASHINGTON, D.C.

CONOCO COAL  
DEVELOPMENT COMPANY  
STAMFORD, CONNECTICUT

RELEASES				VESSEL DATA			
DRG. NO.	DATE	ISSUED FOR		1	ITEM NO: TK-2717 NO REQ'D: ONE		
		DATE OF ORDER	PURCHASE SHELL AND HEAD MATERIAL. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.	2	SERVICE: <u>SLUDGE HOLDING TANK</u>		
			ISSUE CHECKED FOSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS. FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.	3			
			FIELD CONSTRUCTION	4	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: ATM.	PSIG
				5	DESIGN PRESSURE	INT: ATMOS.	PSIG
				6	EXY:	---	PSIG
				7	OPER. LIQUID HOLD-UP PRESS:	---	PSIG
				8	OPER. PRESS. DROP THRU VESSEL:	---	PSIG
				9	MAX. RELIEVING PRESS. AT TOP NO.	---	PSIG
				10	MAX. OPER. TEMPERATURE:	AMBIENT	
				11	DESIGN TEMPERATURE:	AMBIENT	
				12	SPECIFIC GRAVITY (PROCESS FLUID):	1.0	
				13	WIND DATA: PER 1910-40A1		
				14			
				15			
				16	EARTHQUAKE DATA: PER 1910-40A1		
				17	CODE: API-650	STAMPED	---
				18	P.W.M.T. FOR CODE: --	FOR PROCESS: --	
				19	RADIOGRAPHED:	---	
				20	JOINT EFFICIENCY:	85%	
				21	CORROSION ALLOW./CLAD THK:	1/8"	
				22	MAT'L SHELL:	SA-283 GR.C	
				23	MAT'L HEADS:	CONV - SA-283 GR.C	
				24	MAT'L SUPPORTS:	SA-36	
				25	MAT'L FLANGES:	SA-181 GR.1	SEE 27
				26	MAT'L NOZZLES:	SA-53 GR. B	SEE 27
				27	EXTERNAL BOLTING:	A-193 GR. B7/194-2H	
				28	INTERNAL BOLTING:		
				29	GASKETS:		
				30	TYPE OF HEAD:		
				31	INSULATION:	YES, BY OTHERS IN FIELD	
				32	PAINT/PREPARATION:	PER 1910-83A1	
				33	PRIMER:		
				34	COATS:		
				35	PARTS:		
				36	SHIPMENT:	KNOCKED DOWN FIELD	
				37		ERECTED	
				38	EMPTY WGT:	28,750 (TK + parts)	LBS.
				39	WATER (ONLY) WGT:	239,000	LBS.
				40	INSULATION WGT:	17.2	LBS.
				41	GUNITES WGT:	---	LBS.
				42	OPER. LIQUID WGT:	---	LBS.
				43			
				44			
NOZZLE CHART							
CONN. NO.	SIZE	ANSI RATING	SERVICE	NO.			
1	24"	API CODE	MANNAY CLANDEST	1			
2	3"	150"	OVERFLOW	1			
3	3"		OUTLET	1			
4	2"		INLET	3			
5							
6							
7	2"		TCV	1			
8	1 1/2"		TT	1			
9	1 1/2"		TG	1			
10	4"		DRAIN	1			
REVISIONS							
2	1/11	CB	REV. PER TASK VI CONSISTENCY REV.				
1	1/10	J	REVISED TANK BTM HEAD				
REV. DATE	BY	DESCRIPTION					
FOSTER WHEELER ENERGY CORPORATION 110 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY				PIPELINE GAS DEMONSTRATION PLANT NOBLE COUNTY, OHIO CONTRACT No. EF-77-C-01-2542			
REFERENCE DRAWINGS, REQUISITIONS, STANDARDS 1910-1100, 1910-40A1, 1910-83A1, API-650 (AS APPLICABLE), 1910-14A1,				DRAWN	JR	11/10/84	CONTRACT NUMBER
				CHECKED			15-1910
				APPROVED			REQUISITION NUMBER
							27-1910-2142-B
							P.O. NUMBER
							DRAWING NUMBER
							1910-4-4-2717 2
							REV.



**NOTES**

1. VESSEL FABRICATOR TO SUPPLY AND INSTALL (AS MARKED):

- INSULATION ATTACHMENTS
- PLATFORM AND LADDER ATTACHMENTS
- PIPE SUPPORTS

2. EXTERNAL PLATE COILS ON BOTTOM 5'-0" OF TANK.

**NOTE:** M-2702, AEROBIC DIGESTION AERATION SYSTEM IS CONTAINED WITHIN TK-2718. VERTICAL TUBE STATIC AERATORS LIE ON THE BOTTOM OF TANK.

RELEASES				VESSEL DATA			
REV.	DATE	ISSUED FOR		1	ITEM NO: TK-2718 NO REQ: ONE		
		PURCHASE SHELL AND HEAD MATERIAL. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.		2	SERVICE: AEROBIC DIGESTION TANK		
		ISSUE CHECKED FOSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS. FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.		3	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: ATM.	PSIG
		FIELD CONSTRUCTION		4	MAX: ATM.	PSIG	
NOZZLE CHART				5	INT: ATM.	PSIG	
CONN. NO.	SIZE	ANSI RATING	SERVICE	NO.	EXT: ATM. <td>PSIG</td> <td></td>	PSIG	
1	24"	API-650	MANWAY	1	OPER. LIQUID HOLD-UP PRESS:	9.5	PSIG
2	2"	150# R.F.	INLET	3	OPER. PRESS. DROP THRU VESSEL:		PSIG
3	3"		OUTLET	1	MAX. RELIEVING PRESS AT TOP HD.		PSIG
4	3"		DRAIN	1	MAX. OPER. TEMPERATURE:	90°F	
5	2"		TCV	1	DESIGN TEMPERATURE:	100°F	
					SPECIFIC GRAVITY (PROCESS FLUID):	1.0	
					WIND DATA: PER SPEC. 1910-40A1		
					EARTHQUAKE DATA: PER SPEC. 1910-40A1		
					CODE: API-650 STAMPED -		
					P.W.M.T. FOR CODE: NO FOR PROCESS: NO		
					RADIOGRAPHED: SPOT		
					JOINT EFFICIENCY: 85%		
					CORROSION ALLOW: 1/16"		
					MAT'L SHELL: SA-285-C		
					MAT'L HEADS: SA-285-C		
					MAT'L SUPPORTS: SA-285-C		
					MAT'L FLANGES: -		
					MAT'L NOZZLES: SA-106 B		
					EXTERNAL BOLTING: A193 GR. B7/194-2H		
					INTERNAL BOLTING: -		
					BASKETS: 1/8" SPIRAL WOUND ASB. FILLER		
					TYPE OF HEADS: OPEN TOP / BOTT. CONE DCL		
					INSULATION: YES; 2" (BY OTHERS) (NOTE 2)		
					PAINT PREPARATION: PER SPEC. 1910-B3A1		
					PRIMER: -		
					COATS: -		
					PARTS: LUGS ONLY		
					SHIPMENT: KNOCKED DOWN		
					EMPTY WGT: 20500	LB.	
					WATER (ONLY) WGT: 306300	LB.	
					INSULATION WGT: 3700	LB.	
					GUNITE WGT: -	LB.	
					OPER. LIQUID WGT: -	LB.	
2	2/1/81	C.S.	REV. PER TASK VI CONSISTENCY REV.				
1	11/2/80	C.S.	REV. PER CUSTOM. COMMENTS				
REV.	DATE	BY	DESCRIPTION				
REVISIONS							
<b>FOSTER WHEELER ENERGY CORPORATION</b> 110 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY				<b>PIPELINE GAS DEMONSTRATION PLANT</b> NOBLE COUNTY, OHIO CONTRACT NO. EF-77-C-01-2542			
REFERENCE DRAWINGS, REQUISITIONS, STANDARDS 1910-B3A1, 110DA, 14A1, 10B1A1, API-650				DRAWN C.S. 10/29/80	CONTRACT NUMBER 15-1910		
				CHECKED	REQUISITION NUMBER 27-1910-2142-C		
				APPROVED	P.O. NUMBER		
DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C.				<b>AEROBIC DIGESTION TANK (TK-2718)</b> <b>WASTEWATER TREATMENT (SEC. 2700)</b> <b>PIPELINE GAS DEMONSTRATION PLANT</b> <b>CONOCO/DOE</b>			
CONOCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT				NOBLE COUNTY, OHIO DRAWING NUMBER 1910-4-14-0082			

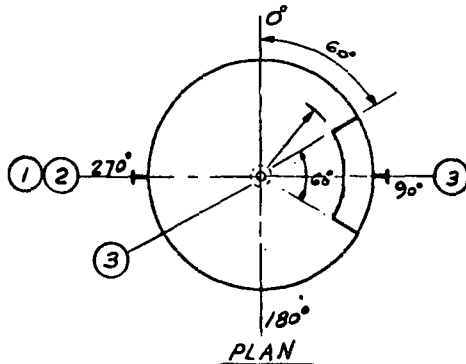
36

FORM NO. 131

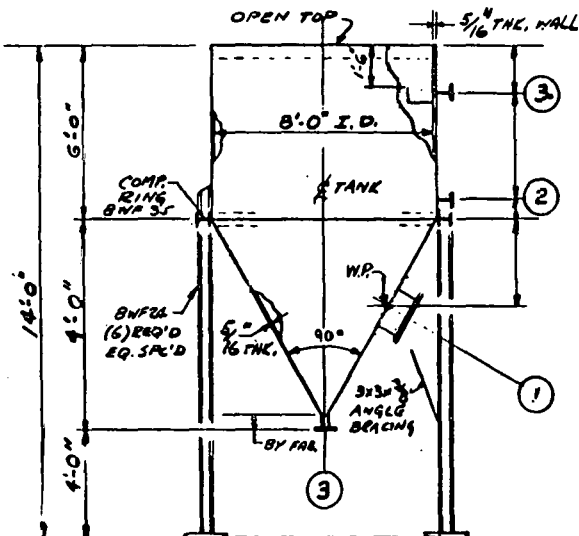


**NOTE**

- 1. VESSEL FABRICATOR TO SUPPLY AND INSTALL (AS MARKED)
- INSULATION ATTACHMENTS
- PLATFORM AND LADDER ATTACHMENTS
- PIPE SUPPORTS



**PLAN**



**ELEVATION**

**RELEASES**

NO.	DATE	ISSUED FOR
1		PURCHASE SHELL AND HEAD MATERIAL. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.
2		ISSUE CHECKED POSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS. FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.
3		FIELD CONSTRUCTION

**NOZZLE CHART**

CONC. NO.	SIZE	API RATING	SERVICE	REQD.
1	20"	API CODE	MANWAY	1
2	3"	150"	INLET	1
3	3"	150"	OUTLETS	2

**VESSEL DATA**

1	ITEM NO: <b>TK-2719</b>	NO REQD: <b>ONE</b>
2	SERVICE: <b>DIGESTED SLUDGE SETTLING TANK</b>	
3	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: ATM. PSIG
4	DESIGN PRESSURE	MAX: ATM. PSIG
5	OPER. LIQUID HOLD-UP PRESS.	INT: ATMOS PSIG
6	OPER. PRESS. DROP THRU VESSEL	EXT: — PSIG
7	MAX. RELIEVING PRESS. AT TOP NO.	— PSIG
8	MAX. OPER. TEMPERATURE	90°F
9	DESIGN TEMPERATURE	100°F
10	SPECIFIC GRAVITY (PROCESS FLUID)	1.0
11	WIND DATA	PER 1910-40A1
12	EARTHQUAKE DATA	PER 1910-40A1
13	CODE	API-650X STAMPED —
14	P.W.H.T. FOR CODE	— FOR PROCESS: —
15	RADIOGRAPHED	—
16	JOINT EFFICIENCY	85%
17	CORROSION ALLOW. (LBS/IN)	1/8"
18	MAT'L SHELL	SA-283-GR. C
19	MAT'L HEADS	CONV - SA-283-GR. C
20	MAT'L SUPPORTS	SA-36
21	MAT'L FLANGES	SA-181-GR. 1
22	MAT'L NOZZLES	SA-53 GR. B
23	EXTERNAL BOLTING	A 193 GR B 7/194-24
24	INTERNAL BOLTING	NONE
25	GASKETS	S. S. SPIRAL WOUND ASB. FILLED
26	TYPE OF HEADS	OPEN TOP, CONE BTM
27	INSULATION	NONE
28	PAINT PREPARATION	PER 1910-40A1
29	PRIMER	
30	COATS	
31	PARTS	
32	SHIPMENT	ONE PIECE
33	EMPTY WGT.	4600 (TK + SUPPL) LBS.
34	WATER (ONLY) WGT.	27,000 LBS.
35	INSULATION WGT.	1100 LBS.
36	GUNITE WGT.	— LBS.
37	OPER. LIQUID WGT.	— LBS.

REV. DATE	BY	DESCRIPTION
2	2/1/81 C.A.	REV. PER TASK VI CONSISTENCY REVIEW
3	1/1/81 J.	INITIAL ISSUE



**FOSTER WHEELER ENERGY CORPORATION**  
170 SOUTH ORANGE AVENUE  
LIVINGSTON, NEW JERSEY.

**PIPELINE GAS DEMONSTRATION PLANT**  
NOBLE COUNTY, OHIO  
CONTRACT No. EF-77-C-01-2542

REFERENCE DRAWINGS, REQUIREMENTS, STANDARDS  
1910-1100; 1910-14A1 (AS APPLI) \*  
1910-40A1; 1910-83A1; API-650

DRAWN	✓	1/1/80
CHECKED		
APPROVED		

CONTRACT NUMBER  
**15-1910**

REQUISITION NUMBER  
**27-1910-1141-B**

P.O. NUMBER

DEPARTMENT OF ENERGY  
COAL CONVERSION DIVISION  
WASHINGTON, D.C.

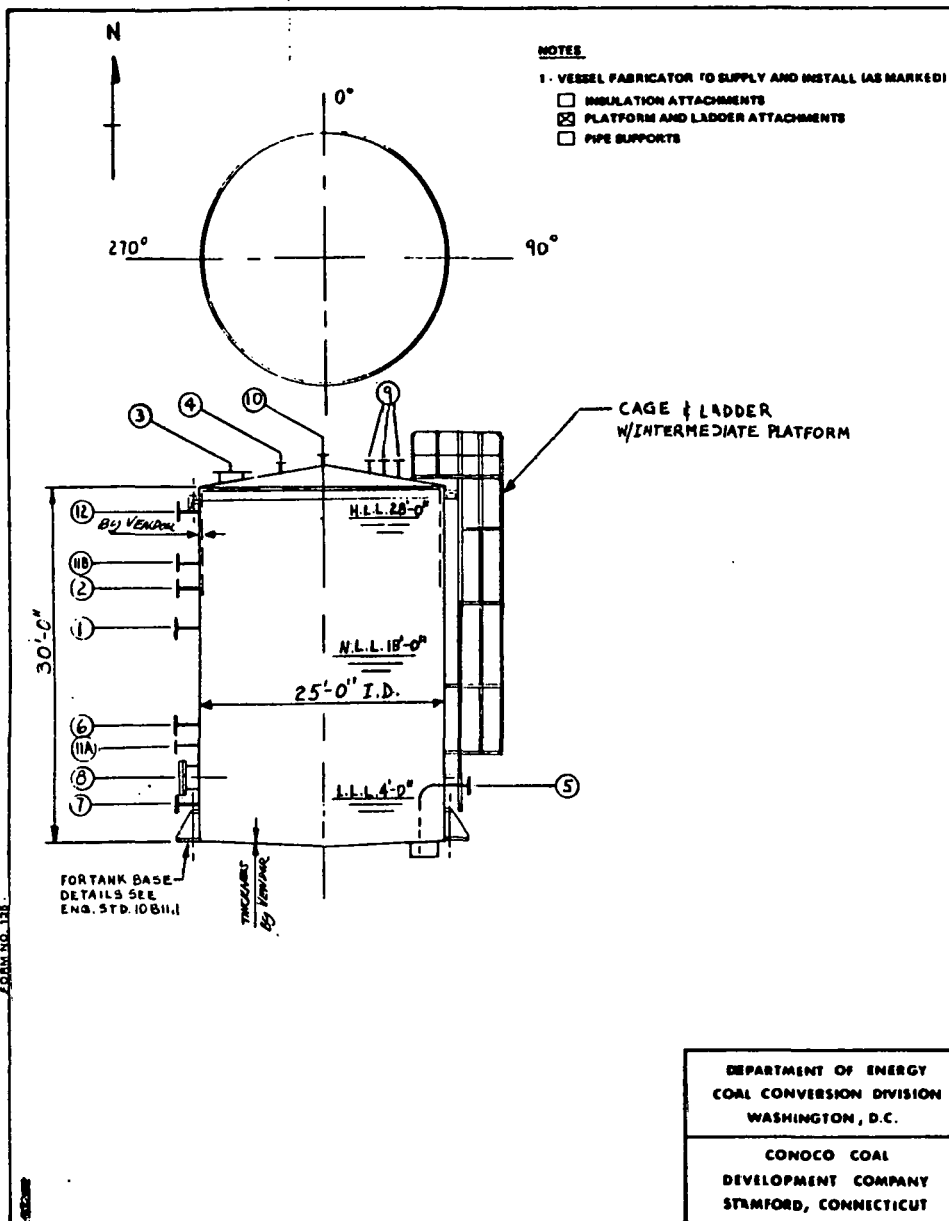
CONOCO COAL  
DEVELOPMENT COMPANY  
STAMFORD, CONNECTICUT

**DIGESTED SLUDGE SETTLING TANK**  
**TK-2719**  
**WASTEWATER TREATMENT SEC. 2700**  
**PIPELINE GAS DEMONSTRATION PLANT**  
**NOBLE COUNTY, OHIO**

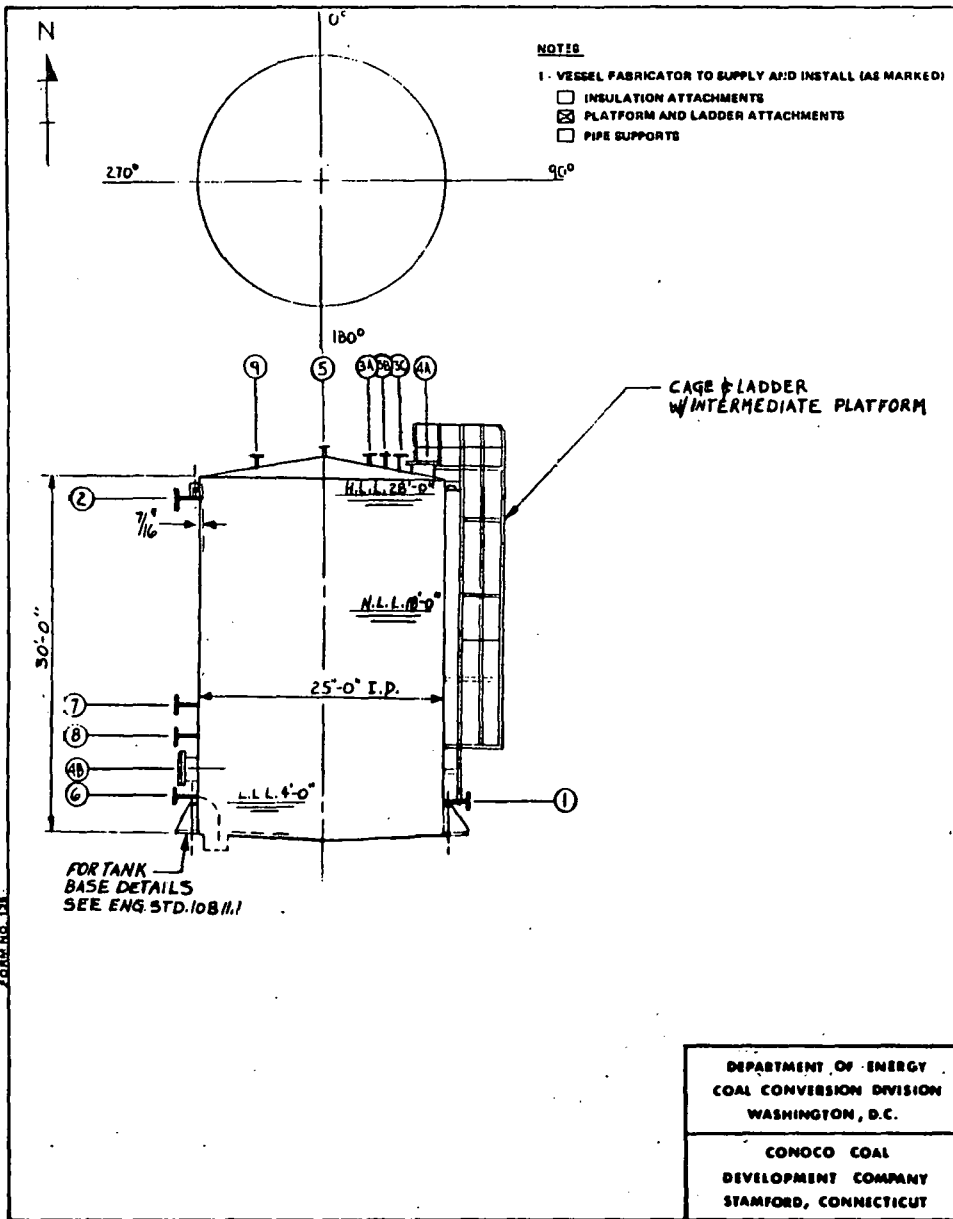
DRAWING NUMBER  
**1910-A-14-27009**

REV.  
**2**

38



RELEASES				VESSEL DATA																																																																																
ISSUED FOR	DATE OF ORDER	PURCHASE SHELL AND HEAD MATERIAL. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.	1	ITEM NO: TK-2720	NO REGD: ONE																																																																															
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<p>NOZZLE CHART</p> <table border="1"> <thead> <tr> <th>CONN. NO.</th> <th>SIZE</th> <th>ANSI RATING</th> <th>SERVICE</th> <th>NO. REQD.</th> </tr> </thead> <tbody> <tr><td>1</td><td>2"</td><td>150 R.F.</td><td>INLET</td><td>1</td></tr> <tr><td>2</td><td>4"</td><td></td><td>INLET</td><td>1</td></tr> <tr><td>3</td><td>20"</td><td>API-650</td><td>MANWAY</td><td>1</td></tr> <tr><td>4</td><td>8"</td><td>150 R.F.</td><td>GAUGE HATCH</td><td>1</td></tr> <tr><td>5</td><td>3"</td><td></td><td>DRAIN</td><td>1</td></tr> <tr><td>6</td><td>6"</td><td></td><td>OUTLET</td><td>1</td></tr> <tr><td>7</td><td>12"</td><td></td><td>OUTLET</td><td>1</td></tr> <tr><td>8</td><td>20"</td><td>API-650</td><td>MANWAY COVER/DAVIT</td><td>1</td></tr> <tr><td>9</td><td>1 1/2"</td><td>3000 PSI G</td><td>LG (TAPE TYPE)</td><td>3</td></tr> <tr><td>10</td><td>2"</td><td>150 R.F.</td><td>VENT</td><td>1</td></tr> <tr><td>11</td><td>1 1/2"</td><td></td><td>LT</td><td>2</td></tr> <tr><td>12</td><td>4"</td><td></td><td>OVERFLOW</td><td>1</td></tr> </tbody> </table>				CONN. NO.	SIZE	ANSI RATING	SERVICE	NO. REQD.	1	2"	150 R.F.	INLET	1	2	4"		INLET	1	3	20"	API-650	MANWAY	1	4	8"	150 R.F.	GAUGE HATCH	1	5	3"		DRAIN	1	6	6"		OUTLET	1	7	12"		OUTLET	1	8	20"	API-650	MANWAY COVER/DAVIT	1	9	1 1/2"	3000 PSI G	LG (TAPE TYPE)	3	10	2"	150 R.F.	VENT	1	11	1 1/2"		LT	2	12	4"		OVERFLOW	1	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>2/9/81</td> <td>C.S.</td> <td>REV. PER TASK VI CONSISTENCY REVIEW</td> </tr> <tr> <td>1</td> <td>11/19</td> <td>C.S.</td> <td>REV. PER CUST. COMMENTS</td> </tr> </tbody> </table>				REV.	DATE	BY	DESCRIPTION	2	2/9/81	C.S.	REV. PER TASK VI CONSISTENCY REVIEW	1	11/19	C.S.	REV. PER CUST. COMMENTS
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<p>CONOCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT</p>				<p>PIPELINE GAS DEMONSTRATION PLANT NOBLE COUNTY, OHIO CONTRACT No. EF-77-C-01-2542</p>																																																																																
<p>REFERENCE DRAWINGS, REQUISITIONS, STANDARDS 1910-83A1; 1100A; 14A1; 10B11.1; 1910-40A1 API-650.</p>				<p>DRAWN C.S. 8/13/80</p>		<p>CONTRACT NUMBER 15-1910</p>																																																																														
				<p>CHECKED</p>		<p>REQUISITION NUMBER 27-1910-2142-D</p>																																																																														
				<p>APPROVED</p>		<p>P.O. NUMBER</p>																																																																														
<p>TREATED WASTEWATER STORAGE TANK (TK-2720) WASTEWATER TREATMENT (SECTION 2700)</p>				<p>PIPELINE GAS DEMONSTRATION PLANT NOBLE COUNTY OHIO</p>																																																																																
				<p>DRAWING NUMBER 1910-4-14-27005</p>		<p>REV. 2</p>																																																																														



RELEASES		
CHG. REV.	DATE	ISSUED FOR
		PURCHASE SHELL AND HEAD MATERIAL. PREPARE BUT DO NOT SUBMIT SHOP DETAIL DRAWINGS.
		ISSUE CHECKED FOSTER WHEELER DRAWING. PURCHASE ALL OTHER MATERIALS. FINALIZE AND SUBMIT CHECKED SHOP DETAIL DRAWING WITHIN ONE WEEK OF RELEASE DATE. PROCEED WITH COMPLETE FABRICATION.
		FIELD CONSTRUCTION

NOZZLE CHART				
CONN. NO.	SIZE	ANSI RATING	SERVICE	NO. REQ'D
1	6"	150 <sup>#</sup> R.F.	OUTLET	1
2	4"		OVERFLOW	1
3	1 1/2"	3000 <sup>#</sup> CRG	LT	3
4	2.0"	API-650	MANWAY / COVER / DAVIT	2
5	2"	150 <sup>#</sup> R.F.	VENT	1
6	3"		DRAIN	1
7	6"		INLET	1
8	4"		INLET	1
9	8"		GAUGE HATCH	1

REV.	DATE	BY	DESCRIPTION
1	11/9/81	C.S.	REV. PER TASK VJ CONSISTENCY REV.
0	10/1/79	C.S.	INITIAL ISSUE

VESSEL DATA			
1	ITEM NO:	TK-2722	NO REQ'D: CNE
2	SERVICE:	EVAPORATOR FEED TANK	
3			
4	OPER. PRESSURE ABOVE LIQUID LEVEL	NORM: ATM.	PSIG
5		MAX: ATM.	PSIG
6	DESIGN PRESSURE	INT: ATM.	PSIG
7		EXT: ATM.	PSIG
8	OPER. LIQUID HOLD-UP PRESS:	7.8	PSIG
9	OPER. PRESS. DROP THRU VESSEL:		PSIG
10	MAX. RELIEVING PRESS. AT TOP HD.		PSIG
11	MAX. OPER. TEMPERATURE:	95°F	
12	DESIGN TEMPERATURE:	100°F	
13	SPECIFIC GRAVITY (PROCESS FLUID):	1.0	
14	WIND DATA:	PER SPEC. 1910-40A1	
15			
16	EARTHQUAKE DATA:	PER SPEC. 1910-40A1	
17	CODE:	API-650	STAMPED
18	P.W.N.T. FOR CODE:	NO	FOR PROCESS: NO
19	RADIOGRAPHED:	SPOT	
20	JOINT EFFICIENCY:	85%	
21	CORROSION ALLOW./CLAD THK:	1/16"	
22	MAT'L SHELL:	SA-285-C	
23	MAT'L HEADS:	SA-285-C	
24	MAT'L SUPPORTS:	SA-283-C	
25	MAT'L FLANGES:		
26	MAT'L NOZZLES:	SA-106-B	
27	EXTERNAL BOLTING:	A-193GR.B7/192-ZH	
28	INTERNAL BOLTING:		
29	GASKETS:	1/8" SPIRAL WOUND ASBESTOS FILLER	
30	TYPE OF HEADS:	CONICAL TOP & BOTT. CONE DOWN	
31	INSULATION:	NONE	
32	PAINT PREPARATION:	PER SPEC. 1910 6.2.1	
33	PRIMER:		
34	COATS:		
35	PARTS:	LUGS ONLY	
36	SHIPMENT:	KNOCKED DOWN FIELD RECT.	
37			
38	EMPTY WGT:	60600	LBS
39	WATER (ONLY) WGT:	979500	LBS
40	INSULATION WGT:		LBS
41	GUMITE WGT:		LBS
42	OPER. LIQUID WGT:	918200	LBS
43			
44			

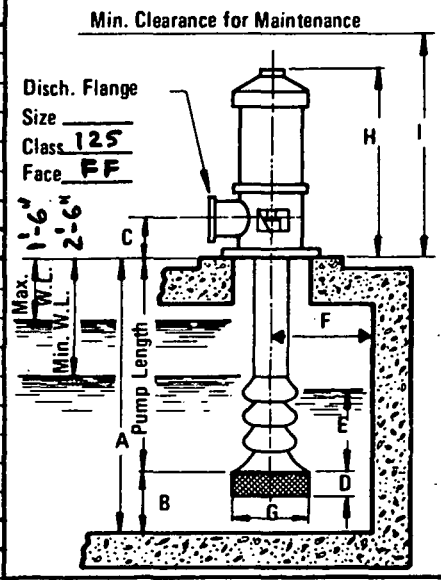
<b>FOSTER WHEELER ENERGY CORPORATION</b> 110 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY	<b>PIPELINE GAS DEMONSTRATION PLANT</b> NOBLE COUNTY, OHIO CONTRACT No. EF-77-C-01-2542	
	REFERENCE DRAWINGS, REQUISITIONS, STANDARDS 1910-83A1, 1100A, 14A1, 108 II.1, 40A1, API-650	DRAWN C.S. 1/27/81
	CHECKED APPROVED	REQUISITION NUMBER 27-1910-2142-E
DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C.	<b>EVAPORATOR FEED TANK (TK-2722)</b> <b>WASTEWATER TREATMENT (SECTION 2700)</b> <b>PIPELINE GAS DEMONSTRATION PLANT</b> NOBLE COUNTY OHIO	
CONOCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT	DRAWING NUMBER 1910-4-14-27010	REV. 1



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2701 A, B</b>		<b>27-1910-1311-A</b>		<b>30 JULY 80</b>	
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 Nov. 80</b>	C4	
SERVICE <b>EQUALIZATION BASIN PUMP</b>				C2	<b>29 Dec. 80</b>	C5	
MFR				C3	<b>4 FEB. 81</b>	C6	
NO. REQUIRED <b>2</b>							
1 OPERATING CONDITIONS, EACH PUMP							
2	Liquid	<b>WATER</b>	U.S. GPM, Rated	<b>225</b>			
3	Pumping Temp. Deg. F	<b>95</b>	U.S. GPM, Normal	<b>159</b>			
4	Max. P.T. Deg. F	<b>100</b>	Disch. Press., PSIG *	<b>25</b>			
5	S.G. @ P.T.	<b>1.0</b>	Pump Length, In.				
6	Vap. Press., PSIA @ P.T.	<b>1.0</b>	Min. Water Level, $\pm$	<b>7'-6"</b>			
7	Visc. @ P.T., $\mu$ CUS	<b>1.0</b>	Max. Water Level, $\pm$	<b>8'-6"</b>			
8	<b>PH RANGE IS 6.0 TO 8.0 * At Pump Discharge Flange</b>						
9 PERFORMANCE							
10	Efficiency, %	Perf. Curve No.					
11	Total Bowl Head, Ft.	NPSHR, Ft.					
12	BHP @ Rated GPM **	Min. Subm. Req'd. (E) In.					
13	Speed, RPM	Bowl Max. W.P. PSIG					
14	Max. BHP	Bowl Hydrotest, PSIG					
15	Min. Contin. GPM	Disch. Head W.P., PSIG					
16	Shutoff Head, Ft.	Disch. Head Hydro, PSIG					
17	Max. Disch. Press, PSIG						
18	** Incl. All Internal Losses						
19 CONSTRUCTION							
20	Model/Size	Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW					
21	No. Stages	Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor					
22	Bowl Dia. In.	Column Assbly. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed					
23	Imp. Dia. In.	Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed					
24	Imp. Type	No. Line Shaft Brgs.					
25	Bowl Shaft Dia. In.	Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.					
26	Line Shaft Dia. In.	Packing Type No. Rings					
27	Column Dia. In.	Line Shaft Lube					
28	Max. Thrust Lbs., Down	Coupling Mfr.					
29	Up	Type					
30 MATERIALS OF CONSTRUCTION <b>I-I</b>							
31	Bowl	<b>C.I.</b>	Impeller	<b>C.I.</b>			
32	Bowl Wear Rings		Imp. Wear Ring				
33	Bowl Shaft		Line Shaft				
34	Bowl Bearings		Line Shaft Brgs.				
35	Disch. Head		Head Shaft				
36	Column		Suction Strainer				
37							
38 DRIVER							
39	<input checked="" type="checkbox"/> Furn. By Pump Mfr.	Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate		TESTS			
40	<input checked="" type="checkbox"/> Motor: Item <b>P-2701 A, B</b>	Type <b>VERT. IND.</b>		Shop Insp.	<input checked="" type="checkbox"/>	WITN.	<input type="checkbox"/>
41	Mfr.	<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft		Hydrotest	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42	HP	<input type="checkbox"/> Non-Reverse Ratchet		Performance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43	Encl. <b>TEFC</b> Frame	Insul. <b>B or F</b> Lubr. Type		NPSHR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44	<b>V 460 PH 3 HZ 60 SF 1.15</b>	<b>LRA FLA</b>		APPLICABLE DOCUMENTS			
45	<input type="checkbox"/> Refer to Page	Attached for Other Type Drivers					
46 SITE DATA							
47	<input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor	Amb. Temp. Deg. F <b>92</b> Max. <b>-10</b> Min.		<b>1910-1300 A</b>			
48	<input checked="" type="checkbox"/> Area Class <b>GRP</b>	DIV <input checked="" type="checkbox"/> Non-Hazardous		<b>1910-31A3</b>			
49	Altitude, Ft. <b>1000</b>	Switch Encl. <input checked="" type="checkbox"/> WP <input type="checkbox"/> XP		<b>1910-38A6</b>			
50	<b>BAR. PR. = 14.21 PSIA</b>						
51							
BY	<b>SJ</b>		P.O.	VENDOR			



DIMENSIONS, INCHES

A = <b>10'-0"</b>	E
B	F
C	G
D	H
	I

WEIGHT, LBS. EACH

Pump	
Motor	

ACCESSORIES FURN. BY PUMP MFR.

<input checked="" type="checkbox"/> Soleplate
<input checked="" type="checkbox"/> Suction Strainer
<input type="checkbox"/> Air Release Valve
<input type="checkbox"/> Pre-Lube Tank and Fittings
<input type="checkbox"/>
<input type="checkbox"/>

TESTS

	REQ'D.	WITN.	CERT.
Shop Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydrotest	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Performance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NPSHR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPLICABLE DOCUMENTS

<b>1910-1300 A</b>
<b>1910-31A3</b>
<b>1910-38A6</b>

FORM NO. 135-335





# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT	CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	NOBLE COUNTY, OHIO	ITEM NO. P-2704 A/B/C	27-1910-1312-A	4 AUG. 80
MATERIAL			C1	29 Dec. 80
OR			C2	9 Feb. 81
SERVICE	DIGESTED SLUDGE PUMP		C3	
			C4	
			C5	
			C6	

Vendor shall furnish three (3) pneumatic diaphragm pumps for the following operating conditions:

Liquid	Sludge, 1-5% solids
Pumping Temperature	95°F , 100°F Max.
Specific Gravity at Operating Temp.	1.0
Vapor, pr. at Operating Temperature	1.0 psia
Viscosity	4 cks
Capacity	1 to 5 GPM
Suction Pressure	0 to 5 psig Max.
Discharge Pressure	15 psig
NPSH Available	20 ft.
Size of Solids	1/2" Max.
Material of Construction	C.S.

Vendor will furnish the pumps with check valves, indicate required air min. pressure and air consumption, and provide operating characteristics.

Quotation will include price, dimensional data, weight and delivery.

Applicable specification is 1910-1300 A.

FORM NO. 435-801

BY	SJ	P.O. NO.	SUPPLIER
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# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2705 A, B</b>		<b>27-1910-1311-B</b>		<b>4 Aug. 80</b>	
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 Nov. 80</b>	C4	
SERVICE <b>RECOVERED OIL PUMP</b>				C2	<b>29 Dec. 80</b>	C5	
MFR. NO. REQUIRED <b>2</b>				C3	<b>4 FEB. 81</b>	C6	
<b>1 OPERATING CONDITIONS, EACH PUMP</b>							
Liquid <b>Oil/WATER MIX</b>		U.S. GPM, Rated <b>50</b>					
Pumping Temp. Deg. F <b>AMB.</b>		U.S. GPM, Normal					
Max. P.T. Deg. F <b>200</b>		Disch. Press., PSIG <b>40</b>					
S.G. @ P.T. <b>1.0 (0.8 MIN.)</b>		Pump Length, In.					
Vap. Press., PSIA @ P.T. <b>1.0 (7.5 MAX.)</b>		Min. Water Level, In. <b>1'-0"</b>					
Visc. @ P.T., CPUS <b>1.0 (50 MAX.)</b>		Max. Water Level, In. <b>7'-0"</b>					
		* At Pump Discharge Flange					
<b>9 PERFORMANCE</b>							
Efficiency, %		Perf. Curve No.					
Total Bowl Head, Ft.		NPSHR, Ft.					
BHP @ Rated GPM **		Min. Subm. Req'd. (E) In.					
Speed, RPM		Bowl Max. W.P. PSIG					
Max. BHP		Bowl Hydrotest, PSIG					
Min. Contin. GPM		Disch. Head W.P., PSIG					
Shutoff Head, Ft.		Disch. Head Hydro, PSIG					
Max. Disch. Press, PSIG							
		** Incl. All Internal Losses					
<b>19 CONSTRUCTION</b>							
Model/Size		Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW		<b>DIMENSIONS, INCHES</b>			
No. Stages		Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor		A = <b>8'-0"</b>		E	
Bowl Dia. In.		Column Assy. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed		B		F	
Imp. Dia. In.		Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed		C		G	
Imp. Type		No. Line Shaft Brgs.		D		H	
Bowl Shaft Dia. In.		Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.				I	
Line Shaft Dia. In.		Packing Type No. Rings					
Column Dia. In.		Line Shaft Lube		<b>WEIGHT, LBS. EACH</b>			
Max. Thrust Lbs., Down		Coupling Mfr.		Pump			
Up		Type		Motor			
<b>30 MATERIALS OF CONSTRUCTION S-1</b>				<b>ACCESSORIES FURN. BY PUMP MFR.</b>			
Bowl <b>C.S.</b>		Impeller <b>C.I.</b>		<input checked="" type="checkbox"/> Soleplate			
Bowl Wear Rings		Imp. Wear Ring		<input checked="" type="checkbox"/> Suction Strainer			
Bowl Shaft		Line Shaft		<input type="checkbox"/> Air Release Valve			
Bowl Bearings		Line Shaft Brgs.		<input type="checkbox"/> Pre-Lube Tank and Fittings			
Disch. Head		Head Shaft		<input type="checkbox"/>			
Column		Suction Strainer		<input type="checkbox"/>			
<b>38 DRIVER</b>							
<input checked="" type="checkbox"/> Furn. By Pump Mfr.		Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate		<b>TESTS</b>			
<input checked="" type="checkbox"/> Motor: Item <b>P-2705 A, B</b>		Type <b>VERT. IND.</b>		REQ'D.		WITN.	
Mfr.		<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft		Shop Insp. <input checked="" type="checkbox"/>		CERT.	
HP <b>RPM</b>		<input type="checkbox"/> Non-Reverse Ratchet		Hydrotest <input checked="" type="checkbox"/>		<input type="checkbox"/>	
Encl. <b>TEFC</b> Frame		Insul. <b>B or F</b> Lubr. Type		Performance <input checked="" type="checkbox"/>		<input type="checkbox"/>	
<b>V 460PH 3 HZ 60 SE 1.15</b>		LRA <b>FLA</b>		NPSHR <input type="checkbox"/>		<input type="checkbox"/>	
<b>46 SITE DATA</b>							
<input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor		Amb. Temp. Deg. F <b>92</b> Max. <b>-10</b> Min.		<b>1910-1300A</b>			
<input checked="" type="checkbox"/> Area Class <b>I</b> GRP <b>D</b> DIV <b>2</b>		<input type="checkbox"/> Non-Hazardous		<b>1910-31A3</b>			
Altitude, Ft. <b>1000</b>		Switch Encl. <input checked="" type="checkbox"/> WP <input type="checkbox"/> XP		<b>1910-38A6</b>			
<b>BAR. PR. = 14.21 PSIA</b>							
BY <b>S J</b>		P.O.		VENDOR			

FORM NO. 135-335



REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO.		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO. <b>P-2709A/B</b>		<b>27-1910-1314-A</b>		<b>29 JULY 80</b>	
MATERIAL <b>PROPORTIONING PUMPS</b>				C1	<b>6 Nov. 80</b>	C4	
SERVICE <b>CAUSTIC METERING PUMPS</b> NO. REQ'D <b>2</b>				C2	<b>6 FEB 81</b>	C5	
MFR. _____ MODEL _____				C3		C6	
PROCESS REQUIREMENTS:		PUMP DRIVER: (BY PUMP MFR.)		PACKAGE UNIT: <input type="checkbox"/> REQ'D. <input type="checkbox"/> NONE			
LIQUID <b>20% CAUSTIC</b>		MOTOR:		TANK (WITH LEGS & PUMP PLATFORM):			
TEMP., OF. <b>AMB. (100. MAX)</b>		MFR. _____		U.S. GAL. CAPACITY _____			
SP. GR. <b>1.2 (1.0 MIN.)</b>		HP _____		MATERIAL _____			
NPSHA. FT. <b>15.</b>		RPM _____		TYPE COVER _____			
U.S. GPD MAX. <b>200. GPD</b>		SERVICE FACTOR <b>1.15</b>		TYPE BOTTOM _____			
MIN. <b>0. GPD</b>		V./PH./HZ. <b>115/1/60</b>		MIXER BRACKET _____			
DISCH. PSIG <b>10.</b>		ENCLOSURE _____		DIA. X HEIGHT _____			
SUCT. PSIG <b>0. (3. MAX.)</b>		TYPE _____		TOTAL UNIT HEIGHT _____			
DIFF. PSI <b>10.</b>		FRAME NO. _____		FILL CONN. #1 _____			
<b>CORROSION FROM CAUSTIC</b>		F.L. AMPS _____		FILL CONN. #2 _____			
MIN. REQ'D CONTROL _____		L.R. AMPS _____		OVERFLOW CONN. _____			
PUMP DATA:		INSUL. CLASS _____		DRAIN CONN. _____			
NO. OF HEADS _____		OC. RISE _____		DRAIN PLUG _____			
PLUNGER DIA. _____		GEAR:		DRAIN VALVE _____			
MAX. STROKE _____		MFR. _____		GAGE GL. CONNS. _____			
RPM _____		RATED HHP _____		GAGE & COCKS _____			
U.S. GPH MAX. <b>200 GPD</b>		SERVICE FACTOR _____		HEATER _____			
MIN. _____		TYPE _____		LEVEL SWITCH _____			
MAX. WORK. PSIG _____		COUPLING:		FLOAT _____			
HYDROTEST PSIG _____		MFR. _____		PIPING SYSTEMS:			
PSV SET. PSIG _____		TYPE _____		MATERIAL _____			
NPSHR FT. _____		MODEL _____		SIZE/RATING: _____			
MAX. TEMP. OF _____		NET BHP REQ'D _____		SUCT. PIPE _____			
CONTROL METHOD <b>AUTOMATIC STROKE</b>		CONTROL METHOD <b>ADJUSTMENT DURING OPERATION</b>		DISCH. PIPE _____			
CHECKS: TYPE _____		COUPLINGS _____		PSV DISCH. PIPE _____			
NO. PER VALVE _____		MOVEMENTS _____		PSV _____			
PACKING TYPE _____		MAT'L. _____		SUCT. STRAINER _____			
SUCTION: SIZE _____		(GUARD REQ'D. FOR ALL EXPOSED MOVING PARTS AND COUPLINGS)		SUCT. DRAIN _____			
RATING <b>125#</b>		DISSOLVING BASKET: <input type="checkbox"/> YES <input type="checkbox"/> NO		SUCT. BLOCK VALVE _____			
DISCH.: SIZE _____		MATERIAL _____		DISCH. BLOCK VALVE _____			
RATING <b>125#</b>		PUMP MATERIALS:		MIXER (AGITATOR): <input type="checkbox"/> YES <input type="checkbox"/> NO			
CYLINDER OR HEAD _____		SHOP TESTS: REQ'D. WITNESS		MFR. _____			
PLUNGER _____		HYDROTEST PUMP _____		MODEL _____			
DIAPHRAGM _____		PUMP MECH'L RUN _____		MOUNT METHOD _____			
VALVES: CHECKS _____		PUMP PERFORMANCE _____		SHAFT MATERIAL _____			
SEATS _____		MIXER MECH'L RUN _____		IMPELLER MAT'L. _____			
BODY _____		CHECK CONTROLS _____		DRIVER:			
PLUNGER GUIDE _____		SET PSV _____		HP _____			
LANTERN RING _____		SITE DATA: <input checked="" type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR		RPM _____			
GLAND _____		<input type="checkbox"/> CL. <input type="checkbox"/> SR. <input type="checkbox"/> DIV. _____		V./PH./HZ _____			
PACKING _____		<input checked="" type="checkbox"/> NON-HAZARDOUS.		ENCLOSURE _____			
BASEPLATE _____		AMBIENT <b>92</b> OF. MAX. & <b>-10</b> OF. MIN.		TYPE _____			
HOUSING FRAME _____		APPLICABLE DOCUMENTS:		F.L. AMPS _____			
NOTES: <b>1. PUMP TO HAVE INTERNAL RELIEF VALVE</b>		GENERAL NOTES <b>1910-1300A</b>		L.R. AMPS _____			
<b>2. PNEUMATIC CONTROL DEVICE FOR STROKE ADJUSTMENT FURNISHED BY VENDOR.</b>		MOTOR SPEC. <b>1910-3BAG</b>		INSUL. CLASS _____			
BY <b>AMB</b>		P.O. NO. _____		OC. RISE _____			
		VENDOR _____					

FORM NO. 135-308



REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <u>CONOCO/DOE</u>		CONTRACT NO. <u>15-1910</u>		REQUISITION NO.		DATE	
SITE <u>NOBLE COUNTY, OHIO</u>		ITEM NO. <u>P-2710A/B</u>		<u>27-1910-1314-B</u>		<u>29 JULY 80</u>	
MATERIAL <u>PROPORTIONING PUMPS</u>				C1	<u>6 NOV 80</u>	C4	
SERVICE <u>ACID METERING PUMPS</u> NO. REQ'D <u>2</u>				C2	<u>6 FEB 81</u>	C5	
MFR. _____				C3		C6	
MODEL _____							
PROCESS REQUIREMENTS:		PUMP DRIVER: (BY PUMP MFR.)		PACKAGE UNIT: <input type="checkbox"/> REQ'D. <input type="checkbox"/> NONE			
LIQUID <u>66 BAUME H<sub>2</sub>SO<sub>4</sub></u>		MOTOR:		TANK (WITH LEGS & PUMP PLATFORM):			
TEMP., °F. <u>AMB. (100. MAX.)</u>		MFR. _____		U.S. GAL. CAPACITY _____			
SP. GR. <u>1.8 (1.7 MIN.)</u>		HP _____		MATERIAL _____			
NPSHA, FT. <u>OVER 20.</u>		RPM _____		TYPE COVER _____			
U.S. GPH: MAX. <u>200. GPD</u>		SERVICE FACTOR <u>1.15</u>		TYPE BOTTOM _____			
MIN. <u>0. GPD</u>		V./PH./HZ. <u>115/1/60</u>		MIXER BRACKET _____			
DISCH. PSIG <u>10.</u>		ENCLOSURE _____		DIA. X HEIGHT _____			
SUCT. PSIG <u>0. (3.5 MAX.)</u>		TYPE _____		TOTAL UNIT HEIGHT _____			
DIFF. PSI" <u>10.</u>		FRAME NO. _____		FILL CONN. #1 _____			
<u>CORROSION FROM ACID</u>		F.L. AMPS _____		FILL CONN. #2 _____			
MIN. REQ'D CONTROL _____		L.R. AMPS _____		OVERFLOW CONN. _____			
		INSUL. CLASS _____		DRAIN CONN. _____			
		OC. RISE _____		DRAIN PLUG _____			
				DRAIN VALVE _____			
				GAGE GL. CONNS. _____			
				GAGE & COCKS _____			
				HEATER _____			
				LEVEL SWITCH _____			
				FLOAT _____			
PUMP DATA:		GEAR:		PIPING SYSTEMS:			
NO. OF HEADS _____		MFR. _____		MATERIAL _____			
PLUNGER DIA. _____		RATED HHP _____		SIZE/RATING: _____			
MAX. STROKE _____		SERVICE FACTOR _____		SUCT. PIPE _____			
RPM _____		TYPE _____		DISCH. PIPE _____			
U.S. GPH MAX. <u>200 GPD</u>				PSV DISCH. PIPE _____			
MIN. _____				PSV _____			
MAX. WORK. PSIG _____		COUPLING:		SUCT. STRAINER _____			
HYDROTEST PSIG _____		MFR. _____		SUCT. DRAIN _____			
PSV SET. PSIG _____		TYPE _____		SUCT. BLOCK VALVE _____			
NPSHR FT. _____		MODEL _____		DISCH. BLOCK VALVE _____			
MAX. TEMP. °F _____				DISSOLVING BASKET: <input type="checkbox"/> YES <input type="checkbox"/> NO			
NET BHP REQ'D _____				MATERIAL _____			
CONTROL METHOD <u>AUTOMATIC STROKE</u>							
<u>ADJUSTMENT DURING OPERATION</u>							
CHECKS: TYPE _____		GUARDS:					
NO. PER VALVE _____		COUPLINGS _____					
PACKING TYPE _____		MOVEMENTS _____					
SUCTION: SIZE _____		MAT'L. _____					
RATING <u>150#</u>		(GUARD REQ'D. FOR ALL EXPOSED					
DISCH.: SIZE _____		MOVING PARTS AND COUPLINGS)					
RATING <u>150#</u>							
PUMP MATERIALS:		SHOP TESTS: <u>REQ'D. WITNESS</u>		MIXER (AGITATOR): <input type="checkbox"/> YES <input type="checkbox"/> NO			
CYLINDER OR HEAD _____		HYDROTEST PUMP _____		MFR. _____			
PLUNGER _____		PUMP MECH'L RUN _____		MODEL _____			
DIAPHRAGM <u>TEFLON</u>		PUMP PERFORMANCE _____		MOUNT METHOD _____			
VALVES: CHECKS _____		MIXER MECH'L RUN _____		SHAFT MATERIAL _____			
SEATS _____		CHECK CONTROLS _____		IMPELLER MAT'L. _____			
BODY _____		SET PSV _____		DRIVER:			
PLUNGER GUIDE _____				HP _____			
LANTERN RING _____				RPM _____			
GLARO _____		SITE DATA: <input checked="" type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR		V./PH./HZ _____			
PACKING _____		<input type="checkbox"/> CL. _____ <input type="checkbox"/> DIV. _____		ENCLOSURE _____			
BASEPLATE _____		<input checked="" type="checkbox"/> NON-HAZARDOUS.		TYPE _____			
HOUSING FRAME _____		AMBIENT <u>92</u> °F. MAX. & <u>-10</u> °F. MIN.		F.L. AMPS _____			
		APPLICABLE DOCUMENTS:		L.R. AMPS _____			
NOTES: 1) PUMP TO HAVE		GENERAL NOTES <u>1910-1300A</u>		INSUL. CLASS _____			
<u>INTERNAL RELIEF VALVE.</u>		MOTOR SPEC. <u>1910-38A6</u>		OC. RISE _____			
2) PNEUMATIC CONTROL DEVICE							
<u>FOR STROKE ADJUSTMENT FURNISHED BY VENDOR</u>							
BY <u>AMB</u>		P.O. NO. _____		VENDOR _____			

FORM NO. 135-309



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO.		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO. <b>P-2711 A, B</b>		<b>27-1910-1313-A</b>		<b>4 Aug. 80</b>	
MATERIAL <b>ROTARY PUMP</b>		NO. REQ'D <b>2</b>		C1	<b>6 NOV. 80</b>	C4	
SERVICE <b>RETURN SLUDGE PUMP</b>		C2	<b>29 Dec 80</b>	C5			
MFR	MODEL	SIZE	C3	<b>6 FEB 81</b>	C6		
1 OPERATING CONDITIONS, EACH PUMP				PERFORMANCE			
2 LIQUID <b>ACTIVATED SLUDGE</b>				PROPOSAL CURVE NO.			
3 CORRIEROS, FROM <b>SOLIDS, POWDERED CARBON</b>				NPSHR, FT (H <sub>2</sub> O)			
4 PUMPING TEMP, DEG F <b>95°F, 100°F MAX.</b>				MECH EFF. %		RPM	
5 S. P. GR. @ P. T. <b>1.0</b>				BHP RATED		MAX	
6 VAP. PRESS. @ P. T., PSIA <b>1.0</b>				ROTATION FACING COUPLING END			
7 VISC. @ P. T., <b>CKS 4</b>				PSV BY <input type="checkbox"/> BUILT IN <input type="checkbox"/> EXTERNAL			
8 U. S. GPM @ P. T., NORMAL <b>110 (11)</b> RATED <b>110</b>				PSV SET PRESS., PSIG			
9 DISCH. PSIG <b>10</b>		SUCT. PSIG <b>0.6</b>		MAX CASING DESIGN		PSIG DEG F	
10 DIFF. PRESS., PSI <b>~ 10</b>		NPSHA, FT <b>20 +</b>					
11				CONNECTIONS	SIZE	RATING	FACING
12				SUCTION		<b>125#</b>	<b>FF</b>
13				DISCHARGE		<b>125#</b>	<b>FF</b>
14 CONSTRUCTION				DRIVER <b>VARIDRIVE</b>			
15 TYPE: <input type="checkbox"/> GEAR <input type="checkbox"/> VANE <input checked="" type="checkbox"/> SCREW				FURNISHED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
16 CASING MOUNT: <input type="checkbox"/> CENTERLINE <input checked="" type="checkbox"/> FOOT				MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
17 <input type="checkbox"/> BRACKET <input type="checkbox"/> VERTICAL				<input checked="" type="checkbox"/> MOTOR: ITEM NO. <b>P-2711A, BMFR</b>			
18 AUX. CONNS: <input checked="" type="checkbox"/> VENT <input checked="" type="checkbox"/> DRAIN				HP RPM <b>S. F. 1.15</b> FRAME			
19 REARINGS: <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL				TYPE <b>HDR, IND, ENCL. TEFC</b> INSUL. CL <b>B or F</b>			
20 TYPE: <b>RADIAL BALL</b> THRUST <b>BALL</b>				V <b>460</b> PH <b>3</b> HZ <b>60</b> LRA <b>FLA</b>			
21 LUBRICATION				LUBRICATION			
22 SHAFT SEAL: <input type="checkbox"/> MECHANICAL <input checked="" type="checkbox"/> PACKING				<input type="checkbox"/> TURBINE: ITEM NO. _____ MFR			
23 NUMBER OF SEALS				REFER TO PAGE _____ ATTACHED			
24 MFR _____ MODEL _____							
25 TIMING GEARS: <input checked="" type="checkbox"/> INTERNAL <input type="checkbox"/> EXTERNAL							
26 COUPLING: MFR _____ TYPE _____							
27 GUARD TYPE <b>OSHA</b>				GEAR REDUCER			
28 BASEPLATE <input checked="" type="checkbox"/> DRAIN RIM <input checked="" type="checkbox"/> EXTND FOR DRIVE				MFR _____		MODEL _____	
29 WATER COOLING <input type="checkbox"/> BRGS <input type="checkbox"/> STUFFING BOX				RATED HP _____		AGMA S. F. _____	
30 <input type="checkbox"/> PEDESTAL <input type="checkbox"/> GLAND				LUBRICATION _____			
31 WATER REQ'D GPM _____							
32 STEAM JACKETING <input type="checkbox"/> CASE <input type="checkbox"/> STUFFING BOX				TESTS		REQUIRED	
33 JACKET STEAM _____ PSIG		DEG F _____		PERFORMANCE		<input checked="" type="checkbox"/> <input type="checkbox"/>	
34 EXHAUST PSIG _____				NPSH		<input type="checkbox"/> <input type="checkbox"/>	
35 STEAM REQ'D, LBS/HR _____				HYDRO		<input type="checkbox"/> <input type="checkbox"/>	
36							
37							
38							
39 MATERIALS				DOCUMENTS			
40 CASING <b>C 1</b>		SHAFT		<input checked="" type="checkbox"/> <b>1910-1300A</b>			
41 LINER		SLEEVE		<input checked="" type="checkbox"/> <b>1910-38A6</b>			
42 ROTOR		TIMING GEARS		<input type="checkbox"/>			
43				<input type="checkbox"/>			
44							
45							
46							
47							
48							
49							
50							
51							
NOTES							
1) MANUALLY CONTROLLED CAPACITY AS REQUIRED (VARI-DRIVE SHALL BE PROVIDED).							
2) DISCHARGE PRESSURE RELIEF VALVE SHALL BE FURNISHED TO PROTECT PUMP.							
3) CONCENTRATION OF SOLIDS IS UP TO 3%, SP. GR. OF SOLIDS = 1.01							
BY <b>SJ</b>		P. O. NO.		VENDOR			

FORM NO. 135-308 A

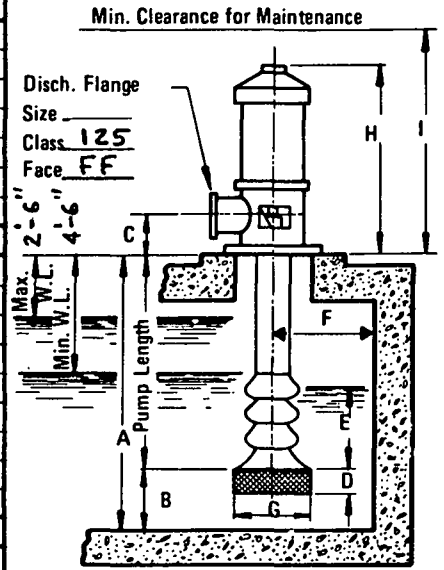


# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2712 A, B</b>		<b>27-1910-1311-D</b>		<b>4 AUG, 80</b>	
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 NOV, 80</b>	C4	
SERVICE <b>FILTER FEED PUMP</b>				C2	<b>29 DEC, 80</b>	C5	
MFR. NO. REQUIRED <b>2</b>				C3	<b>5 FEB, 81</b>	C6	
1 OPERATING CONDITIONS, EACH PUMP							
2	Liquid	<b>WATER</b>	U.S. GPM, Rated	<b>225</b>			
3	Pumping Temp. Deg. F	<b>95</b>	U.S. GPM, Normal	<b>151</b>			
4	Max. P.T. Deg. F	<b>100</b>	Disch. Press., PSIG *	<b>45</b>			
5	S.G. @ P.T.	<b>1.0</b>	Pump Length, In.				
6	Vap. Press., PSIA @ P.T.	<b>1.0</b>	Min. Water Level, In.	<b>4'-6"</b>			
7	Visc. @ P.T., <b>CP CUS</b>	<b>0.7</b>	Max. Water Level, In.	<b>6'-6"</b>			
8	<b>BIOLOGICAL SOLIDS, 100 PPM max; At Pump Discharge Flange</b>						
9 PERFORMANCE							
10	Efficiency, %	Perf. Curve No.					
11	Total Bowl Head, Ft.	NPSHR, Ft.					
12	BHP @ Rated GPM **	Min. Subm. Req'd. (E) In.					
13	Speed, RPM	Bowl Max. W.P. PSIG					
14	Max. BHP	Bowl Hydrotest, PSIG					
15	Min. Contin. GPM	Disch. Head W.P., PSIG					
16	Shutoff Head, Ft.	Disch. Head Hydro, PSIG					
17	Max. Disch. Press, PSIG						
18	** Incl. All Internal Losses						
19 CONSTRUCTION							
20	Model/Size	Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW					
21	No. Stages	Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor					
22	Bowl Dia. In.	Column Assbly. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed					
23	Imp. Dia. In.	Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed					
24	Imp. Type	No. Line Shaft Brgs.					
25	Bowl Shaft Dia. In.	Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.					
26	Line Shaft Dia. In.	Packing Type No. Rings					
27	Column Dia. In.	Line Shaft Lube					
28	Max. Thrust Lbs., Down	Coupling Mfr.					
29	Up	Type					
30	MATERIALS OF CONSTRUCTION <b>I-1</b>			ACCESSORIES FURN. BY PUMP MFR.			
31	Bowl	<b>C.I.</b>	Impeller	<b>C.I.</b>	<input checked="" type="checkbox"/> Soleplate		
32	Bowl Wear Rings		Imp. Wear Ring		<input checked="" type="checkbox"/> Suction Strainer		
33	Bowl Shaft		Line Shaft		<input type="checkbox"/> Air Release Valve		
34	Bowl Bearings		Line Shaft Brgs.		<input type="checkbox"/> Pre-Lube Tank and Fittings		
35	Disch. Head		Head Shaft		<input type="checkbox"/>		
36	Column		Suction Strainer		<input type="checkbox"/>		
37							
38 DRIVER				38 TESTS			
39	<input checked="" type="checkbox"/> Furn. By Pump Mfr.	Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate		REQ'D.	WITN.	CERT.	
40	<input checked="" type="checkbox"/> Motor: Item <b>P-2712 A, B</b>	Type <b>VERT. IND.</b>		Shop Insp.	<input checked="" type="checkbox"/>		
41	Mfr.	<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft		Hydrotest	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42	HP	RPM	<input type="checkbox"/> Non-Reverse Ratchet	Performance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43	Encl. <b>TEFC</b> Frame	Insul. <b>Box F</b>	Lubr. Type <b>GREASE</b>	NPSHR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44	<b>V 460 PH 3 HZ 60 SF 1.15 LRA FLA</b>						
45	<input type="checkbox"/> Refer to Page	Attached for Other Type Drivers					
46 SITE DATA				APPLICABLE DOCUMENTS			
47	<input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor	Amb. Temp. Deg. F	<b>92</b>	Max.	<b>-10</b>		
48	Area Class	<b>GRP</b>	DIV	<input checked="" type="checkbox"/> Non-Hazardous			
49	Altitude, Ft.	<b>1000</b>		Switch Encl.	<input checked="" type="checkbox"/> WP <input type="checkbox"/> XP		
50							
51							
BY	<b>SJ</b>		P.O.	VENDOR			



FORM NO. 135-335



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2713A/B</b>		<b>27-1910-1311-E</b>		<b>4 Aug, 80</b>	
MATERIAL <b>CENTRIFUGAL PUMP</b>		NO. REQ'D. <b>2</b>		C1	<b>6 Nov. 80</b>	C4	
SERVICE <b>BACKWASH PUMPS</b>				C2	<b>29 Dec. 80</b>	C5	
MFR.	MODEL	SIZE		C3	<b>5 Feb. 81</b>	C6	
1 OPERATING CONDITIONS, EACH PUMP				PERFORMANCE			
2 LIQUID <b>WATER</b>		U. S. GPM RATED <b>800.</b>		PROPOSAL CURVE NO.			
3 PUMPING TEMP DEG F <b>95</b>		U. S. GPM NORMAL <b>0.</b>		SPEED RPM		NO. STAGES	
4 MAX. P T, DEG F <b>100.</b>		MAX SUCTION PSIG <b>11</b>		NPSHR, FT (H <sub>2</sub> O)		MIN CONT. GPM	
5 S. G. AT PT <b>1.0(0.98MIN)</b>		ISCH. PRESS. PSIG <b>53</b>		SHUTOFF HD. FT		% EFF. @ RATING	
6 VAP. PRESS., PSIA @ PT <b>1.0</b>		SUCT. PRESS., PSIG <b>0.</b>		BHP @ RATED GPM		MAX BHP	
7 VISC. @ PT, CKS <b>1.0</b>		DIFF. PRESS., PSI <b>53</b>		IMPELLER DIA. IN		RATED	MAX MIN
8 CORR./ EROS. FROM		DIFF. HEAD, FT <b>123</b>		MAX. ALLOW. CASING PSIG/DEG F			
9		NPSH AVAIL, FT <b>&gt;20.</b>		HYDROSTATIC TEST PRESS. PSIG			
10 PCT & SIZE SOLIDS				MAX POSSIBLE DISCH. PRESS. PSIG			
11 CONSTRUCTION				ROTATION FACING COUPLING <input type="checkbox"/> CW <input type="checkbox"/> CCW			
12 CASING SPLIT <input type="checkbox"/> AXIAL <input checked="" type="checkbox"/> RADIAL				CONNECTIONS		SUCTION	DISCHARGE
13 CASING VOLUTE <input type="checkbox"/> SINGLE <input checked="" type="checkbox"/> DOUBLE <input type="checkbox"/> DIFFUSER				SIZE, INCHES			
14 CASING SUPPORT <input type="checkbox"/> FOOT <input type="checkbox"/> CENTERLINE				RATING/FACING		<b>125" FF</b>	<b>125" FF</b>
15 <input type="checkbox"/> BRACKET <input type="checkbox"/> VERTICAL IN-LINE				LOCATION		<b>END</b>	<b>TOP</b>
16 CASING CONNS. <input checked="" type="checkbox"/> VENT <input checked="" type="checkbox"/> DRAIN <input type="checkbox"/> GAUGE <input type="checkbox"/>				DRIVER			
17 IMPELLER TYPE				FURNISHED BY <input type="checkbox"/> PUMP MFR <input checked="" type="checkbox"/> OTHERS			
18 IMPELLER MTG. <input type="checkbox"/> BETWEEN BRGS <input checked="" type="checkbox"/> OVERHUNG				MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
19 WEAR RINGS <input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK				<input checked="" type="checkbox"/> MOTOR: ITEM NO. <b>P-2713A/B</b> TYPE <b>HDR, IND.</b>			
20 BEARINGS-TYPE: RADIAL <b>BALL</b>		THRUST <b>ANGUL. CONTACT</b>		HP		RPM	FRAME NO.
21 BEARINGS-LUBE: <input checked="" type="checkbox"/> RING <input type="checkbox"/> FLOOD <input type="checkbox"/> FLINGER				ENCL		INSUL.	S. F.
22 <input type="checkbox"/> OIL MIST <input type="checkbox"/> PRESSURE LUBE				MFR		V	PH HZ
23 COUPLING: MFR <b>KOPPERS</b>		TYPE <b>SPACER</b> GUARD TYPE		FLA		LRA	LUBE
24 DRIVER HALF MTD BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR <input type="checkbox"/> OTHERS				THRUST(VERT) LB		UP	DOWN
25 SHAFT SEAL TYPE <input type="checkbox"/> PACKING <input checked="" type="checkbox"/> MECHANICAL				<input type="checkbox"/> TURBINE: ITEM NO. MFR.			
26 PACKING MFR, TYPE		SIZE	NO. RINGS	REFER TO PAGE ATTACHED			
27 SEAL MFR, MODEL <b>B-W</b>		TYPE <b>B</b>		TESTS			
28 MFR, CODE <b>SD4N</b>		API CODE		REQUIRED WITNESSED CERTIFIED			
29 BASEPLATE <input checked="" type="checkbox"/> EXTENDED FOR DRIVER <input checked="" type="checkbox"/> DRAIN RIM				SHOP INSPECT <input checked="" type="checkbox"/>			
30				PERFORMANCE <input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
31 WATER COOLING & SEAL FLUSH PIPING				NPSHR <input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
32 WATER COOLED <input type="checkbox"/> BEARINGS <input type="checkbox"/> STUFFING BOX JACKET				HYDROTEST <input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
33 <input type="checkbox"/> GLAND <input type="checkbox"/> PEDESTALS				MATERIALS-API CLASS- <b>I-1</b>			
34 C. W., PLAN WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE				CASING <b>C.I.</b>		IMPELLER <b>C.I.</b>	
35 TOTAL COOLING WATER REQUIRED, GPM				SHAFT		SLEEVE	
36 WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE				WEAR RINGS		GLAND	
37 EXT. FLUSH, LIQUID @ DEG F GPM PSIG				BASEPLATE <b>FAB. STL.</b>			
38				WEIGHTS, LBS EACH			
39 ACCESSORIES FURNISHED BY PUMP MFR				PUMP		BASEPLATE	
40 <input checked="" type="checkbox"/> SEAL FLUSH PIPING <b>API 11</b> <input type="checkbox"/> STEAM JACKETING				MOTOR		TURBINE	
41 <input type="checkbox"/> COOLING WATER PIPING <input type="checkbox"/>				SITE & UTILITIES			
42 <input type="checkbox"/> OIL PIPING <input type="checkbox"/>				<input type="checkbox"/> INDOORS <input type="checkbox"/> OUTDOORS <input checked="" type="checkbox"/> UNPROTECTED			
43 <input type="checkbox"/> MINIMUM FLOW ORIFICE <input type="checkbox"/>				AMBIENT <b>92</b> DEG F MAX TO <b>-10</b> DEG F MIN			
44				CL GR DIV <input checked="" type="checkbox"/> NON-HAZARDOUS			
45				ALT. FT <b>1000</b> COOLING WATER SOURCE			
46				DEG F: IN, OUT: PSIG IN, OUT			
47				APPLICABLE DOCUMENTS			
48				<input checked="" type="checkbox"/> 1910-1300A			
49				<input checked="" type="checkbox"/> 1910-31A3 <input type="checkbox"/>			
50							
51							
BY <b>SJ</b>		P. O.		VENDOR			

FORM NO. 135-302 A

NOTES



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <i>CONOLO/DOE</i>		CONTRACT <i>15-1910</i>		REQUISITION		DATE			
SITE <i>NOBLE COUNTY, OHIO</i>		ITEM <i>P-2715A/B</i>		<i>27-1910-1311F</i>		<i>4 AUG 80</i>			
MATERIAL <i>VERTICAL SINGLE STAGE CENTRIFUGAL SUMP PUMP</i>				C1	<i>6 NOV 80</i>	C4			
SERVICE <i>COAL PREPARATION AREA BASIN PUMP.</i>				C2	<i>29 DEC 80</i>	C5			
MFR. MODEL NO. SIZE				C3	<i>5 FEB. 81</i>	C6			
OPERATING CONDITIONS, EACH PUMP									
2	LIQUID <i>RAIN WATER</i>	U. S. GPM, RATED	<i>50</i>						
3	PUMPING TEMP. DEG F <i>AMB.</i>	U. S. GPM, NORMAL							
4	MAX. P. T. DEG F <i>100</i>	SUCT. PSIG, MAX.	<i>3</i>						
5	S. G. AT P. T. <i>1.0</i>	DISCH. PRESS., PSIG*	<i>52</i>						
6	VAP. PRESS., PSIA @ P. T. <i>1.0</i>	SUCT. PRESS., PSIG	<i>0</i>						
7	VISC. @ P. T., <i>CRS</i> <i>1.0</i>	DIFF. PRESS., PSI	<i>52</i>						
8	CORR./EROS. FROM <i>GRIT SAND</i>	DIFF. HEAD, FT**	<i>120</i>						
9	<i>COAL FINES</i>	NPSH AVAILABLE	<i>20+</i>						
10	PCT. & SIZE SOLIDS	(TO PUMP INLET FACE)							
11									
PERFORMANCE									
13	PROPOSAL CURVE NO.	MIN CONT. GPM							
14	SPEED, RPM	% EFF. @ RATED GPM							
15	NPSHR, FT H2O	BHP @ RATED GPM							
16	SHUT OFF HEAD, FT	MAX BHP							
17	MAX ALLOW. CASING PSIA	HYDROSTATIC TEST PSIG							
18	MAX. ALLOW. TEMP., DEG F	MIN SUBMERGENCE REQ'D, IN.							
19	MAX. POSS. DISCH. PRESS, PSIG								
CONSTRUCTION									
21	IMPELLER DIA, IN RATED	MAX	MIN	TYPE	PUMP SETTING			IN	
22	WEAR RINGS <input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK				DEPTH, SUMP			<i>16'-0"</i>	
23	UPPER BEARINGS TYPE <i>BALL</i>	LUBE	<i>GREASE</i>	CONNECTIONS				SUCTION DISCHARGE	
24	INTERMEDIATE BRGS, TYPE	NO.	LUBE	SIZE, INCHES					
25	COUPLING: MFR	TYPE, SIZE	RATING/FACING					<i>150 RF</i>	
26	DRIVER HALF MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR	DRIVER							
27	SHAFT SEAL TYPE <input checked="" type="checkbox"/> PACKING <input type="checkbox"/> MECHANICAL <input type="checkbox"/> NONE	FURN. BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS							
28	PACKING: MFR, TYPE	SIZE	MTD. BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS						
29	NO. RINGS	<input checked="" type="checkbox"/> GREASE LUBRICATED	<input checked="" type="checkbox"/> MOTOR: ITEM NO. <i>A, B</i> TYPE <i>IND</i>						
30	SEAL (EXT. MOUNT. PUMP) MFR	TYPE	HP				RPM		
31			S. F. <i>1.15</i>				ENCL. <i>TEFC</i>		
32	INSTALLATION <input type="checkbox"/> SUBMERGED <input checked="" type="checkbox"/> EXTERNALLY MOUNTED	REFER TO PAGE						ATTACHED	
33	MOUNTING PLATE	<i>V 460 PH 3 H2 60</i>							
34	ROTATION, LOOKING DOWN <input type="checkbox"/> CW <input type="checkbox"/> CCW	<input type="checkbox"/> TURBINE: ITEM NO. MFR							
35		REFER TO PAGE,						ATTACHED	
SITE AND UTILITIES									
37	<input type="checkbox"/> INDOORS <input checked="" type="checkbox"/> OUTDOORS: AMBIENT TEMP, DEG F <i>92</i> MAX, <i>-10</i> MIN.	PUMP						MOUNTING PL.	
38	ALT. FT. <i>1000</i>	AREA CLASS	GROUP	DIV	MOTOR			TURBINE	
39	<input checked="" type="checkbox"/> NON HAZARDOUS	SWITCH ENCL. <i>WP</i>							
TESTS				REQ'D	WITN	CERT	MATERIALS		<i>I-1</i>
41	SHOP INSP.	<input checked="" type="checkbox"/>					CASING	<i>CI</i>	ACCESSORIES FURN. BY PUMP MFR.
42	PERF.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			IMPELLER	<i>CI</i>	<input checked="" type="checkbox"/> SUCT. STRAINER <input type="checkbox"/> STEAM JACKET
43	NPSHR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			SHAFT		<input type="checkbox"/> FLOAT OPER. LEVEL SWITCH
44	HYDRO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			DISCH. PIPE		<input type="checkbox"/> SUMP TANK (SEE DATA SHT. PG. )
45							STRAINER		<input type="checkbox"/> START-STOP <input type="checkbox"/> ALTERNATOR
46									<input checked="" type="checkbox"/> SOLE PLATE
47									*DENOTES PRESSURE AT COLUMN DISCHARGE FLG. AT PUMP DISCH.
48									**TOTAL DYNAMIC HEAD INCL. COLUMN HEIGHT ABOVE MIN. LEVEL
49									APPLICABLE DOCUMENTS
50									<input checked="" type="checkbox"/> 1910-1300A <input type="checkbox"/>
51									<input checked="" type="checkbox"/> 1910-31A3
									<input checked="" type="checkbox"/> 1910-38A6
BY	<i>C.A.A.</i>	P. O.	VENDOR						

FORM NO. 135-304A





**REQUISITION**  
**FOSTER WHEELER ENERGY CORPORATION**

CLIENT <u>CONOCO/DOE</u>		CONTRACT NO. <u>15-1910</u>		REQUISITION NO.		DATE	
SITE <u>NOBLE COUNTY, OHIO</u>		ITEM NO. <u>P-2719A/B</u>		<u>27-1910-1314-C</u>		<u>29 JULY 80</u>	
MATERIAL <u>PROPORTIONING PUMPS</u>				C1	<u>6 Nov. 80</u>	C4	
SERVICE <u>NUTRIENT METERING PUMP</u> REQ'D <u>2</u>				C2	<u>6 FEB 81</u>	C5	
MFR				C3		C6	
MODEL							
PROCESS REQUIREMENTS:		PUMP DRIVER: (BY PUMP MFR.)		PACKAGE UNIT: <input type="checkbox"/> REQ'D. <input type="checkbox"/> NONE			
LIQUID <u>55% P<sub>2</sub>O<sub>5</sub> PHOSPHORIC</u>		MOTOR:		TANK (WITH LEGS & PUMP PLATFORM):			
TEMP. OF. <u>AMB. (100 MAX)</u> ACID		MFR.		U.S. GAL. CAPACITY _____			
SP. GR. <u>1.4 (1.0 MIN.)</u>		HP _____		MATERIAL _____			
NPSHA. FT. <u>18.</u>		RPM _____		TYPE COVER _____			
U.S. GPD: MAX. <u>7. GPD</u>		SERVICE FACTOR <u>1.15</u>		TYPE BOTTOM _____			
MIN. <u>0. GPD</u>		V./PH./HZ. <u>115/1/60</u>		MIXER BRACKET _____			
DISCH. PSIG <u>10.</u>		ENCLOSURE _____		DIA. X HEIGHT _____			
SUCT. PSIG <u>0. (3. MAX.)</u>		TYPE _____		TOTAL UNIT HEIGHT _____			
DIFF. PSI <u>10.</u>		FRAME NO. _____		FILL CONN. #1 _____			
<u>CORROSION FROM ACID</u>		F.L. AMPS _____		FILL CONN. #2 _____			
MIN. REQ'D CONTROL _____		L.R. AMPS _____		OVERFLOW CONN. _____			
		INSUL. CLASS _____		DRAIN CONN. _____			
		OC. RISE _____		DRAIN PLUG _____			
				DRAIN VALVE _____			
				GAGE GL. CONNS. _____			
				GAGE & COCKS _____			
				HEATER _____			
				LEVEL SWITCH _____			
				FLOAT _____			
PUMP DATA:		GEAR:		PIPING SYSTEMS:			
NO. OF HEADS _____		MFR. _____		MATERIAL _____			
PLUNGER DIA. _____		RATED HHP _____		SIZE/RATING: _____			
MAX. STROKE _____		SERVICE FACTOR _____		SUCT. PIPE _____			
RPM _____		TYPE _____		DISCH. PIPE _____			
U.S. GPM MAX. <u>7.0 GPD</u>				PSV DISCH. PIPE _____			
MIN. _____				PSV _____			
MAX. WORK. PSIG _____		COUPLING:		SUCT. STRAINER _____			
HYDROTEST PSIG _____		MFR. _____		SUCT. DRAIN _____			
PSV SET. PSIG _____		TYPE _____		SUCT. BLOCK VALVE _____			
NPSHR FT. _____		MODEL _____		DISCH. BLOCK VALVE _____			
MAX. TEMP. °F _____				DISSOLVING BASKET: <input type="checkbox"/> YES <input type="checkbox"/> NO			
NET BHP REQ'D _____				MATERIAL _____			
CONTROL METHOD <u>WHILE PUMP</u>		GUARDS:					
<u>IS RUNNING - MANUAL</u>		COUPLINGS _____					
CHECKS: TYPE _____		MOVEMENTS _____					
NO. PER VALVE _____		MAT'L. _____					
PACKING TYPE _____		(GUARD REQ'D. FOR ALL EXPOSED					
SUCTION: SIZE _____		MOVING PARTS AND COUPLINGS)					
RATING <u>150#</u>							
DISCH.: SIZE _____							
RATING <u>150#</u>							
PUMP MATERIALS: <u>316SS</u>		SHOP TESTS: <u>REQ'D. WITNESS</u>		MIXER (AGITATOR): <input type="checkbox"/> YES <input type="checkbox"/> NO			
CYLINDER OR HEAD _____		HYDROTEST PUMP _____		MFR. _____			
PLUNGER _____		PUMP MECH'L RUN _____		MODEL _____			
DIAPHRAGM _____		PUMP PERFORMANCE _____		MOUNT METHOD _____			
VALVES: CHECKS _____		MIXER MECH'L RUN _____		SHAFT MATERIAL _____			
SEATS _____		CHECK CONTROLS _____		IMPELLER MAT'L. _____			
BODY _____		SET PSV _____		DRIVER:			
PLUNGER GUIDE _____				HP _____			
LANTERN RING _____				RPM _____			
GLAND _____		SITE DATA: <input checked="" type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR		V./PH./HZ _____			
PACKING _____		<input type="checkbox"/> CL. <input type="checkbox"/> CR. <input type="checkbox"/> DIV. _____		ENCLOSURE _____			
BASEPLATE _____		<input checked="" type="checkbox"/> NON-HAZARDOUS.		TYPE _____			
HOUSING FRAME _____		AMBIENT <u>92</u> OF. MAX. & - <u>10</u> OF. MIN.		F.L. AMPS _____			
		APPLICABLE DOCUMENTS:		L.R. AMPS _____			
NOTES: <u>1. PUMP TO HAVE</u>		GENERAL NOTES <u>1910-1300 A</u>		INSUL. CLASS _____			
<u>INTERNAL RELIEF VALVE</u>		MOTOR SPEC. <u>1910-38A6</u>		OC. RISE _____			
BY <u>AMB</u>		P.O. NO.		VENDOR			

FORM NO. 135-308



REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2720 A, B</b>		<b>27-1910-1311-G</b>		<b>4 AUG. 80</b>	
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 Nov. 80</b>	C4	
SERVICE <b>DAF FROTH PUMP</b>				C2	<b>29 Dec. 80</b>	C5	
MFR. _____ NO. REQUIRED <b>2</b>				C3	<b>5 FEB. 81</b>	C6	
1 OPERATING CONDITIONS, EACH PUMP							
2 Liquid <b>OILY FROTH</b>		U.S. GPM, Rated <b>10</b>					
3 Pumping Temp. Deg. F <b>95</b>		U.S. GPM, Normal <b>8</b>					
4 Max. P.T. Deg. F <b>100</b>		Disch. Press., PSIG * <b>15</b>					
5 S.G. @ P.T. <b>1.0</b>		Pump Length, In. _____					
6 Vap. Press., PSIA @ P.T. <b>1.0</b>		Min. Water Level, <b>ft.</b> <b>3'-9"</b>					
7 Visc. @ P.T., <b>CS</b> <b>1</b>		Max. Water Level, <b>ft.</b> <b>5'-9"</b>					
8 <b>SOLIDS &lt; 1%</b>		* At Pump Discharge Flange					
9 PERFORMANCE							
10 Efficiency, % _____		Perf. Curve No. _____					
11 Total Bowl Head, Ft. _____		NPSHR, Ft. _____					
12 BHP @ Rated GPM ** _____		Min. Subm. Req'd. (E) In. _____					
13 Speed, RPM _____		Bowl Max. W.P. PSIG _____					
14 Max. BHP _____		Bowl Hydrotest, PSIG _____					
15 Min. Contin. GPM _____		Disch. Head W.P., PSIG _____					
16 Shutoff Head, Ft. _____		Disch. Head Hydro, PSIG _____					
17 Max. Disch. Press, PSIG _____							
18 ** Incl. All Internal Losses							
19 CONSTRUCTION							
20 Model/Size _____		Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW					
21 No. Stages _____		Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor					
22 Bowl Dia. In. _____		Column Assy. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed					
23 Imp. Dia. In. _____		Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed					
24 Imp. Type _____		No. Line Shaft Brgs. _____					
25 Bowl Shaft Dia. In. _____		Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.					
26 Line Shaft Dia. In. _____		Packing Type _____ No. Rings _____					
27 Column Dia. In. _____		Line Shaft Lube _____					
28 Max. Thrust Lbs., Down _____		Coupling Mfr. _____					
29 _____ Up _____ Type _____		Pump _____ Motor _____					
30 MATERIALS OF CONSTRUCTION <b>I-1</b>							
31 Bowl <b>C.I.</b>		Impeller <b>C.I.</b>					
32 Bowl Wear Rings _____		Imp. Wear Ring _____					
33 Bowl Shaft _____		Line Shaft _____					
34 Bowl Bearings _____		Line Shaft Brgs. _____					
35 Disch. Head _____		Head Shaft _____					
36 Column _____		Suction Strainer _____					
37 _____							
38 DRIVER							
39 <input checked="" type="checkbox"/> Furn. By Pump Mfr.		Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate					
40 <input checked="" type="checkbox"/> Motor: Item <b>P-2720 A, B</b>		Type <b>VERT. IND.</b>					
41 Mfr. _____		<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft					
42 HP _____ RPM _____		<input type="checkbox"/> Non-Reverse Ratchet					
43 Encl. <b>TEFC</b> Frame _____		Insul. <b>Bog F</b> Lubr. Type _____					
44 <b>V 460 PH 3 HZ 60 SF 1.15 LRA FLA</b>							
45 <input type="checkbox"/> Refer to Page _____		Attached for Other Type Drivers _____					
46 SITE DATA							
47 <input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor Amb. Temp. Deg. F <b>92</b> Max. <b>-10</b> Min. _____		<b>1910-1300A</b>					
48 <input checked="" type="checkbox"/> Area Class _____ GRP _____ DIV _____ <input checked="" type="checkbox"/> Non-Hazardous		<b>1910-31A3</b>					
49 Altitude, Ft. <b>1000</b> Switch Encl. <input checked="" type="checkbox"/> WP <input type="checkbox"/> XP		<b>1910-38A6</b>					
50 <b>BAR. PA. = 14.21 PSIA</b>							
51 _____							
BY <b>S J</b>		P.O. _____					
VENDOR _____							

FORM NO. 135-335



REQUISITION

FOSTER WHEELER ENERGY CORPORATION

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2724A/B</b>		<b>27-1910-1311-H</b>		<b>4 AUG 80</b>	
MATERIAL <b>CENTRIFUGAL PUMP</b>		NO. REQ'D. <b>2</b>		C1	<b>6 Nov, 80</b>	C4	
SERVICE <b>TREATED WASTEWATER PUMPS</b>				C2	<b>5 FEB. 81</b>	C5	
MFR.	MODEL	SIZE		C3		C6	
1 OPERATING CONDITIONS, EACH PUMP				PERFORMANCE			
2 LIQUID <b>WATER</b>		U. S. GPM RATED <b>280.</b>		PROPOSAL CURVE NO.			
3 PUMPING TEMP DEG F <b>95</b>		J. S. GPM NORMAL <b>195.</b>		SPEED RPM		NO. STAGES	
4 MAX. P T, DEG F <b>100.</b>		MAX SUCTION PSIG <b>11.</b>		NPSHR, FT (H2O)		MIN CONT. GPM	
5 S. G. AT PT <b>1.0</b>		DISCH. PRESS. PSIG <b>74.</b>		SHUTOFF HD. FT		% EFF. @ RATING	
6 VAP. PRESS., PSIA @ PT <b>1.0</b>		SUCT. PRESS., PSIG <b>0.</b>		BHP @ RATED GPM		MAX BHP	
7 VISC. @ PT, CKS <b>1.0</b>		DIFF. PRESS., PSI <b>74.</b>		IMPELLER DIA. IN		RATED MAX MIN	
8 CORR./ EROS. FROM		DIFF. HEAD, FT <b>171.</b>		MAX. ALLOW. CASING PSIG/DEG F			
9		NPSH AVAIL, FT <b>&gt;20.</b>		HYDROSTATIC TEST PRESS. PSIG			
10 PCT & SIZE SOLIDS		MAX POSSIBLE DISCH. PRESS. PSIG					
11 CONSTRUCTION				ROTATION FACING COUPLING <input type="checkbox"/> CW <input type="checkbox"/> CCW			
12 CASING SPLIT <input type="checkbox"/> AXIAL <input checked="" type="checkbox"/> RADIAL		CONNECTIONS		SUCTION		DISCHARGE	
13 CASING VOLUTE <input checked="" type="checkbox"/> SINGLE <input type="checkbox"/> DOUBLE <input type="checkbox"/> DIFFUSER		SIZE, INCHES					
14 CASING SUPPORT <input checked="" type="checkbox"/> FOOT <input type="checkbox"/> CENTERLINE		RATING/FACING		<b>125" FF</b>		<b>125" FF</b>	
15 <input type="checkbox"/> BRACKET <input type="checkbox"/> VERTICAL IN-LINE		LOCATION		<b>END</b>		<b>TOP</b>	
16 CASING CONNS. <input checked="" type="checkbox"/> VENT <input checked="" type="checkbox"/> DRAIN <input type="checkbox"/> GAUGE <input type="checkbox"/>		DRIVER					
17 IMPELLER TYPE		FURNISHED BY <input type="checkbox"/> PUMP MFR <input checked="" type="checkbox"/> OTHERS					
18 IMPELLER MTG. <input type="checkbox"/> BETWEEN BRGS <input checked="" type="checkbox"/> OVERHUNG		MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS					
19 WEAR RINGS <input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK		<input checked="" type="checkbox"/> MOTOR: ITEM NO. <b>P-2724A/B</b> TYPE <b>HOR. IND.</b>					
20 BEARINGS-TYPE: RADIAL <b>BALL</b> THRUST <b>SOLE ANGLE CONTACT</b>		HP		RPM		FRAME NO.	
21 BEARINGS-LUBE: <input checked="" type="checkbox"/> RING <input type="checkbox"/> FLOOD <input type="checkbox"/> FLINGER		ENCL.		INSUL.		S. F.	
22 <input type="checkbox"/> OIL MIST <input type="checkbox"/> PRESSURE LUBE		MFR		V		PH HZ	
23 COUPLING: MFR <b>KOPPERS</b> TYPE <b>FS</b> GUARD TYPE		FLA		LRA		LUBE	
24 DRIVER HALF MTD BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR <input type="checkbox"/> OTHERS		THRUST (VERT) LB		UP		DOWN	
25 SHAFT SEAL TYPE <b>PACKING</b> <input checked="" type="checkbox"/> MECHANICAL		<input type="checkbox"/> TURBINE: ITEM NO. — MFR.					
26 PACKING MFR, TYPE		SIZE		NO. RINGS		REFER TO PAGE ATTACHED	
27 SEAL MFR, MODEL <b>B-W</b> TYPE <b>8X</b>		TESTS REQUIRED WITNESSED CERTIFIED					
28 MFR, CODE <b>5N1X</b> API CODE		SHOP INSPECT <input checked="" type="checkbox"/>					
29 BASEPLATE <input checked="" type="checkbox"/> EXTENDED FOR DRIVER <input checked="" type="checkbox"/> DRAIN RIM		PERFORMANCE <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					
30		NPSHR <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
31 WATER COOLING & SEAL FLUSH PIPING		HYDROTEST <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>					
32 WATER COOLED <input type="checkbox"/> BEARINGS <input type="checkbox"/> STUFFING BOX JACKET		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
33 <input type="checkbox"/> GLAND <input type="checkbox"/> PEDESTALS		MATERIALS - API CLASS <b>I-1</b>					
34 C. W., PLAN WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE		CASING <b>C1</b>		IMPELLER <b>C1</b>			
35 TOTAL COOLING WATER REQUIRED, GPM		SHAFT		SLEEVE			
36 WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE		WEAR RINGS		GLAND			
37 EXT. FLUSH, LIQUID @ DEG F GPM PSIG		BASEPLATE <b>FAB. STL.</b>					
38		WEIGHTS, LBS EACH					
39 ACCESSORIES FURNISHED BY PUMP MFR		PUMP		BASEPLATE			
40 <input checked="" type="checkbox"/> SEAL FLUSH PIPING API <b>11</b> <input type="checkbox"/> STEAM JACKETING		MOTOR		TURBINE —			
41 <input type="checkbox"/> COOLING WATER PIPING <input type="checkbox"/>		SITE & UTILITIES					
42 <input type="checkbox"/> OIL PIPING <input type="checkbox"/>		<input type="checkbox"/> INDOORS <input checked="" type="checkbox"/> OUTDOORS <input type="checkbox"/> UNPROTECTED					
43 <input type="checkbox"/> MINIMUM FLOW ORIFICE <input type="checkbox"/>		AMBIENT <b>92</b> DEG F MAX TO <b>-10</b> DEG F MIN					
44		CL GR DIV <input checked="" type="checkbox"/> NON-HAZARDOUS					
45		ALT. FT <b>1000</b> COOLING WATER SOURCE					
46		DEG F: IN, OUT: PSIG IN, OUT					
47		APPLICABLE DOCUMENTS					
48		<input checked="" type="checkbox"/> <b>1910-1300A</b>					
49		<input checked="" type="checkbox"/> <b>1910-31A3</b>					
50							
51							
BY <b>SJ</b>		P.O.		VENDOR			

FORM NO. 135-302 A

NOTES

SECTION 2700  
WASTE WATER  
TREATMENT



REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE																			
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2725A/B</b>		<b>27-1910-1311-J</b>		<b>4 Aug. 80</b>																			
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 Nov. 80</b>	C4																			
SERVICE <b>CARBON COLUMN FEED PUMPS</b>				C2	<b>29 Dec. 80</b>	C5																			
MFR. NO. REQUIRED <b>2</b>				C3	<b>5 FEB, 81</b>	C6																			
1 OPERATING CONDITIONS, EACH PUMP																									
2 Liquid <b>WATER</b>		U.S. GPM, Rated <b>225</b>																							
3 Pumping Temp. Deg. F <b>95</b>		U.S. GPM, Normal <b>139</b>																							
4 Max. P.T. Deg. F <b>100.</b>		Disch. Press., PSIG * <b>50</b>																							
5 S.G. @ P.T. <b>1.0</b>		Pump Length, In.																							
6 Vap. Press., PSIA @ P.T. <b>1.0</b>		Min. Water Level, In. <b>4'-6"</b>																							
7 Visc. @ P.T., <b>CKS 1.0</b>		Max. Water Level, In. <b>6'-6"</b>																							
8		* At Pump Discharge Flange																							
9 PERFORMANCE																									
10 Efficiency, %		Perf. Curve No.		<table border="1"> <tr> <td colspan="2">DIMENSIONS, INCHES</td> </tr> <tr> <td>A = <b>9'-0"</b></td> <td>E</td> </tr> <tr> <td>B</td> <td>F</td> </tr> <tr> <td>C</td> <td>G</td> </tr> <tr> <td>D</td> <td>H</td> </tr> <tr> <td></td> <td>I</td> </tr> <tr> <td colspan="2">WEIGHT, LBS. EACH</td> </tr> <tr> <td>Pump</td> <td></td> </tr> <tr> <td>Motor</td> <td></td> </tr> </table>				DIMENSIONS, INCHES		A = <b>9'-0"</b>	E	B	F	C	G	D	H		I	WEIGHT, LBS. EACH		Pump		Motor	
DIMENSIONS, INCHES																									
A = <b>9'-0"</b>	E																								
B	F																								
C	G																								
D	H																								
	I																								
WEIGHT, LBS. EACH																									
Pump																									
Motor																									
11 Total Bowl Head, Ft.		NPSHR, Ft.																							
12 BHP @ Rated GPM **		Min. Subm. Req'd. (E) In.																							
13 Speed, RPM		Bowl Max. W.P. PSIG																							
14 Max. BHP		Bowl Hydrotest, PSIG																							
15 Min. Contin. GPM		Disch. Head W.P., PSIG																							
16 Shutoff Head, Ft.		Disch. Head Hydro, PSIG																							
17 Max. Disch. Press, PSIG																									
18		** Incl. All Internal Losses																							
19 CONSTRUCTION																									
20 Model/Size		Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW		<table border="1"> <tr> <td colspan="2">ACCESSORIES FURN. BY PUMP MFR.</td> </tr> <tr> <td><input checked="" type="checkbox"/> Soleplate</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Suction Strainer</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Air Release Valve</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Pre-Lube Tank and Fittings</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> </tr> </table>				ACCESSORIES FURN. BY PUMP MFR.		<input checked="" type="checkbox"/> Soleplate		<input checked="" type="checkbox"/> Suction Strainer		<input type="checkbox"/> Air Release Valve		<input type="checkbox"/> Pre-Lube Tank and Fittings		<input type="checkbox"/>		<input type="checkbox"/>					
ACCESSORIES FURN. BY PUMP MFR.																									
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<input type="checkbox"/>																									
<input type="checkbox"/>																									
21 No. Stages		Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor																							
22 Bowl Dia. In.		Column Assbly. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed																							
23 Imp. Dia. In.		Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed																							
24 Imp. Type		No. Line Shaft Brgs.																							
25 Bowl Shaft Dia. In.		Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.																							
26 Line Shaft Dia. In.		Packing Type No. Rings																							
27 Column Dia. In.		Line Shaft Lube																							
28 Max. Thrust Lbs., Down		Coupling Mfr.																							
29 Up		Type																							
30 MATERIALS OF CONSTRUCTION <b>I-2</b>				30 ACCESSORIES FURN. BY PUMP MFR.																					
31 Bowl <b>C.I.</b>		Impeller <b>C.I.</b>		<input checked="" type="checkbox"/> Soleplate																					
32 Bowl Wear Rings		Imp. Wear Ring		<input checked="" type="checkbox"/> Suction Strainer																					
33 Bowl Shaft		Line Shaft		<input type="checkbox"/> Air Release Valve																					
34 Bowl Bearings		Line Shaft Brgs.		<input type="checkbox"/> Pre-Lube Tank and Fittings																					
35 Disch. Head		Head Shaft		<input type="checkbox"/>																					
36 Column		Suction Strainer		<input type="checkbox"/>																					
37																									
38 DRIVER																									
39 <input checked="" type="checkbox"/> Furn. By Pump Mfr.		Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate		TESTS																					
40 <input checked="" type="checkbox"/> Motor: Item <b>P-2725 A, B</b>		Type <b>VERT. IND.</b>		REQ'D.		WITN.																			
41 Mfr.		<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft		Shop Insp. <input checked="" type="checkbox"/>		Hydrotest <input checked="" type="checkbox"/>																			
42 HP RPM		<input type="checkbox"/> Non-Reverse Ratchet		Performance <input checked="" type="checkbox"/>		NPSHR <input type="checkbox"/>																			
43 Encl. <b>TEFC</b> Frame		Insul. <b>B or F</b> Lubr. Type		NPSHR <input type="checkbox"/>		NPSHR <input type="checkbox"/>																			
44 <b>V 460 PH 3 HZ 60 SF 1.15 LRA FLA</b>				APPLICABLE DOCUMENTS																					
45 <input type="checkbox"/> Refer to Page		Attached for Other Type Drivers		<b>1910-1300A</b>																					
46 SITE DATA																									
47 <input checked="" type="checkbox"/> Indoor <input type="checkbox"/> Outdoor		Amb. Temp. Deg. F		Max.		Min.																			
48 <input checked="" type="checkbox"/> Area Class		GRP		DIV		<input checked="" type="checkbox"/> Non-Hazardous																			
49 Altitude, Ft. <b>1000</b>		Switch Encl.		<input checked="" type="checkbox"/> WP		<input type="checkbox"/> XP																			
50																									
51																									
BY <b>SJ</b>		P. O.		VENDOR																					

FORM NO. 135-335



SECTION 2700  
REQUISITION WASTE WATER TREATMENT

**FOSTER WHEELER ENERGY CORPORATION** PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2726 A, B</b>		<b>27-1910-1311-K</b>		<b>4 AUG. 80</b>	
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 NOV. 80</b>	C4	
SERVICE <b>SPENT BACKWASH PUMP</b>				C2	<b>6 FEB. 81</b>	C5	
MFR. NO. REQUIRED <b>2</b>				C3		C6	
1 OPERATING CONDITIONS, EACH PUMP							
2	Liquid <b>SPENT BACKWASH WATER</b>	U.S. GPM, Rated	<b>50</b>				
3	Pumping Temp. Deg. F <b>95</b>	U.S. GPM, Normal	<b>50</b>				
4	Max. P.T. Deg. F <b>100</b>	Disch. Press., PSIG *	<b>20</b>				
5	S.G. @ P.T. <b>1.0</b>	Pump Length, In.					
6	Vap. Press., PSIA @ P.T. <b>1.0</b>	Min. Water Level, In.	<b>2'-0"</b>				
7	Visc. @ P.T., <b>CR CKS 1.0</b>	Max. Water Level, In.	<b>8'-0"</b>				
8	<b>GRIT, SOLIDS, CARBON FINES, &lt;1%*</b> At Pump Discharge Flange						
9	PERFORMANCE						
10	Efficiency, %	Perf. Curve No.					
11	Total Bowl Head, Ft.	NPSHR, Ft.					
12	BHP @ Rated GPM **	Min. Subm. Req'd. (E) In.					
13	Speed, RPM	Bowl Max. W.P., PSIG					
14	Max. BHP	Bowl Hydrotest, PSIG					
15	Min. Contin. GPM	Disch. Head W.P., PSIG					
16	Shutoff Head, Ft.	Disch. Head Hydro, PSIG					
17	Max. Disch. Press, PSIG						
18	** Incl. All Internal Losses						
19	CONSTRUCTION						
20	Model/Size	Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW					
21	No. Stages	Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor					
22	Bowl Dia. In.	Column Assbly. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed	A <b>9'-0"</b> E				
23	Imp. Dia. In.	Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed	B F				
24	Imp. Type	No. Line Shaft Brgs.	C G				
25	Bowl Shaft Dia. In.	Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.	D H				
26	Line Shaft Dia. In.	Packing Type No. Rings	I				
27	Column Dia. In.	Line Shaft Lube					
28	Max. Thrust Lbs., Down	Coupling Mfr.					
29	Up	Type					
30	MATERIALS OF CONSTRUCTION <b>T-1</b>		WEIGHT, LBS. EACH				
31	Bowl <b>C.I.</b>	Impeller <b>C.I.</b>	Pump				
32	Bowl Wear Rings	Imp. Wear Ring	Motor				
33	Bowl Shaft	Line Shaft					
34	Bowl Bearings	Line Shaft Brgs.					
35	Disch. Head	Head Shaft					
36	Column	Suction Strainer					
37							
38	DRIVER		TESTS				
39	<input checked="" type="checkbox"/> Furn. By Pump Mfr.	Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate	REQ'D. WITN. CERT.				
40	<input checked="" type="checkbox"/> Motor: Item <b>P-2726 A, B</b>	Type <b>VERT. IND.</b>	Shop Insp. <input checked="" type="checkbox"/>				
41	Mfr.	<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft	Hydrotest <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>				
42	HP RPM	<input type="checkbox"/> Non-Reverse Ratchet	Performance <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>				
43	Encl. <b>TEFC</b> Frame	Insul. <b>B or F</b> Lubr. Type	NPSHR <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
44	<b>V 460 PH 3 HZ 60 SF 1.15 LRA FLA</b>						
45	<input type="checkbox"/> Refer to Page	Attached for Other Type Drivers	APPLICABLE DOCUMENTS				
46	SITE DATA		<b>1910-1300A</b>				
47	<input checked="" type="checkbox"/> Indoor <input type="checkbox"/> Outdoor	Amb. Temp. Deg. F <b>92</b> Max. <b>-10</b> Min.	<b>1910-31A3</b>				
48	<input type="checkbox"/> Area Class	GRP DIV <input checked="" type="checkbox"/> Non-Hazardous	<b>1910-38A6</b>				
49	Altitude, Ft. <b>1000</b>	Switch Encl. <input checked="" type="checkbox"/> WP <input type="checkbox"/> XP					
50							
51							
BY	<b>SJ</b>	P.O.	VENDOR				

FORM NO. 135-335

SECTION 2700  
WASTE WATER TREATMENT



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE		
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2727A/B</b>		<b>27-1910-13114</b>		<b>4 AUG 80</b>		
MATERIAL <b>VERTICAL SINGLE STAGE CENTRIFUGAL SUMP PUMP</b>				C1	<b>6 NOV 80</b>	C4		
SERVICE <b>CONTAINED SLUDGE PUMP</b>				C2	<b>29 Dec. 80</b>	C5		
MFR.	MODEL NO.	SIZE		C3	<b>6 FEB. 81</b>	C6		
OPERATING CONDITIONS, EACH PUMP								
2	LIQUID <b>PRIMARY SLUDGE</b>	U. S. GPM, RATED	<b>25</b>					
3	PUMPING TEMP. DEG F	<b>95</b>	U. S. GPM, NORMAL					<b>25</b>
4	MAX. P. T. DEG F	<b>100</b>	SUCT. PSIG, MAX.					<b>3</b>
5	S. G. AT P. T.	<b>1.0</b>	DISCH. PRESS., PSIG*					<b>15</b>
6	VAP. PRESS., PSIA @ P. T.	<b>1.0</b>	SUCT. PRESS., PSIG					<b>0</b>
7	VISC. @ P. T., <b>CS</b>	<b>~ 4</b>	DIFF. PRESS., PSI					<b>15</b>
8	CORR./ EROS. FROM <b>SOLIDS, GRIT</b>		DIFF. HEAD, FT**					<b>35</b>
9			NPSH AVAILABLE					<b>20+</b>
10	PCT. & SIZE SOLIDS	<b>&lt; 3%</b>	(TO PUMP INLET FACE)					
11								
PERFORMANCE								
13	PROPOSAL CURVE NO.		MIN CONT. GPM					
14	SPEED, RPM		% EFF. @ RATED GPM					
15	NPSHR, FT H2O		BHP @ RATED GPM					
16	SHUT OFF HEAD, FT		MAX BHP					
17	MAX ALLOW. CASING PSIA		HYDROSTATIC TEST PSIG					
18	MAX. ALLOW. TEMP, DEG F		MIN SUBMERGENCE REQ'D IN.					
19	MAX. POSS. DISCH. PRESS. PSIG							
CONSTRUCTION								
21	IMPELLER DIA, IN RATED	MAX	MIN	TYPE	PUMP SETTING			IN
22	WEAR RINGS <input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK				DEPTH, <b>SUMP</b>			<b>7'0"</b> IN
23	UPPER BEARINGS TYPE	<b>BALL</b>	LUBE	<b>GREASE</b>	CONNECTIONS	SUCTION	DISCHARGE	
24	INTERMEDIATE BRGS, TYPE		NO.	LUBE	SIZE, INCHES			
25	COUPLING: MFR		TYPE, SIZE		RATING/FACING		<b>125# FF</b>	
26	DRIVER HALF MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR				DRIVER			
27	SHAFT SEAL TYPE <input checked="" type="checkbox"/> PACKING <input type="checkbox"/> MECHANICAL <input type="checkbox"/> NONE				FURN. BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
28	PACKING: MFR, TYPE		SIZE		MTD. BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
29	NO. RINGS		<input checked="" type="checkbox"/> GREASE LUBRICATED		<input checked="" type="checkbox"/> MOTOR: ITEM NO <b>A/B</b> TYPE <b>IND</b>	HP	RPM	
30	SEAL (EXT. MOUNT. PUMP) MFR		TYPE		S. F. <b>1.15</b>	ENCL. <b>TEFC</b>		
31					REFER TO PAGE	ATTACHED		
32	INSTALLATION <input type="checkbox"/> SUBMERGED <input checked="" type="checkbox"/> EXTERNALLY MOUNTED				<b>V. 460 PH. 3 HZ. 60</b>			
33	MOUNTING PLATE				<input type="checkbox"/> TURBINE: ITEM NO. MFR			
34	ROTATION, LOOKING DOWN <input type="checkbox"/> CW <input type="checkbox"/> CCW				REFER TO PAGE	ATTACHED		
35					WEIGHTS, LB, EACH			
SITE AND UTILITIES								
37	<input type="checkbox"/> INDOORS <input checked="" type="checkbox"/> OUTDOORS: AMBIENT TEMP, DEG F <b>92</b> MAX, <b>-10</b> MIN.				PUMP	MOUNTING PL.		
38	ALT. FT. <b>1000</b> AREA CLASS	GROUP	DIV		MOTOR	TURBINE		
39	<input checked="" type="checkbox"/> NON HAZARDOUS	SWITCH ENCL. <b>WP</b>						
TESTS REQ'D WITN CERT				MATERIALS <b>I-1</b>		ACCESSORIES FURN. BY PUMP MFR.		
41	SHOP INSP. <input checked="" type="checkbox"/>			CASING <b>CI</b>	<input checked="" type="checkbox"/> SUCT. STRAINER	<input type="checkbox"/> STEAM JACKET		
42	PERF. <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>			IMPELLER <b>CI</b>	<input type="checkbox"/> FLOAT OPER. LEVEL SWITCH			
43	NPSHR <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			SHAFT	<input type="checkbox"/> SUMP TANK (SEE DATA SHT. PG. )			
44	HYDRO <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>			DISCH. PIPE	<input type="checkbox"/> START-STOP <input type="checkbox"/> ALTERNATOR			
45				STRAINER	<input checked="" type="checkbox"/> <b>SOLE PLATE</b>			
46	*DENOTES PRESSURE AT COLUMN DISCHARGE FLG. AT PUMP DISCH.				APPLICABLE DOCUMENTS			
47	**TOTAL DYNAMIC HEAD INCL. COLUMN HEIGHT ABOVE MIN. LEVEL				<input checked="" type="checkbox"/> <b>1910-1300A</b>	<input type="checkbox"/>		
48	<b>THE PUMP SHALL HAVE NO SUBMERGED BEARING</b>				<input checked="" type="checkbox"/> <b>1910-31A3</b>			
49					<input checked="" type="checkbox"/> <b>1910-3846</b>			
50					<input type="checkbox"/>			
51					<input type="checkbox"/>			
BY	<b>C.M.A.</b>	P. O.		VENDOR				

FORM NO. 135-304A



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	NOBLE COUNTY, OHIO	ITEM NO.	P-2728 A/B	27-1910-1312-B		4 AUG 80	
MATERIAL				C1	29 Dec 80	C4	
OR				C2	9 FEB. 81	C5	
SERVICE	BELT FILTER PRESS FEED PUMP			C3		C6	

Vendor shall furnish two (2) pneumatic diaphragm pumps for the following operating conditions:

Liquid	Sludge, 3 to 5% SOLIDS
Pumping Temperature	95°F, 100°F Max.
Specific Gravity at Operating Temperature	1.2, 1.0 Min.
Vapor pr. at Operating Temperature	1.0 psia
Viscosity	4 cks
Capacity	25 GPM
Suction Pressure	2 to 11 psig
Discharge Pressure	20 psig <sup>1)</sup>
NPSH Available	20 ft.
Size of Solids	1/2" Max.
Material of Construction	C.S.

1) This sludge tends to plug the line, therefore the pump will be occasionally required to deliver pressure up to 100 psig.

Vendor will furnish the pumps with check valves, indicate required air min., pressure and air consumption, and provide operating characteristics.

Quotation will include price, dimensional data, weight and delivery.

Applicable specification is 1910-1300 A.

FORM NO. 135-B01

BY	SJ	P.O. NO.	SUPPLIER
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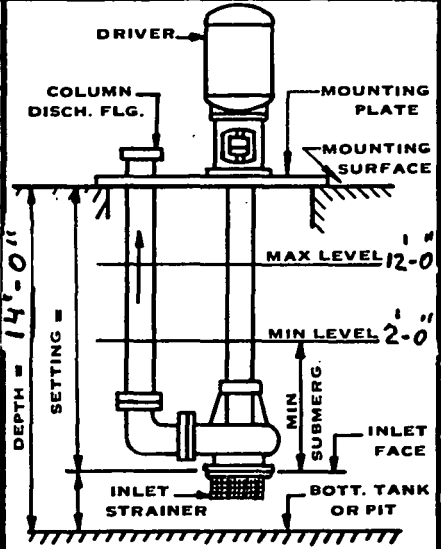


# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE								
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2729A/B</b>		<b>27-1910-1311M</b>		<b>5 AUG 80</b>								
MATERIAL <b>VERTICAL SINGLE STAGE CENTRIFUGAL SUMP PUMP</b>				C1	<b>6 NOV 80</b>	C4								
SERVICE <b>CLEAN STORM WATER PUMP</b>				C2	<b>29 DEC 80</b>	C5								
MFR. MODEL NO. SIZE				C3	<b>6 FEB 81</b>	C6								
OPERATING CONDITIONS, EACH PUMP														
2	LIQUID	<b>CLEAN STORM WATER</b>	U. S. GPM, RATED	<b>50</b>										
3	PUMPING TEMP. DEG F	<b>AMB.</b>	U. S. GPM, NORMAL	<b>50</b>										
4	MAX. P. T. DEG F	<b>70</b>	SUCT. PSIG, MAX.	<b>5</b>										
5	S. G. AT P. T.	<b>1.0</b>	DISCH. PRESS., PSIG*	<b>30</b>										
6	VAP. PRESS., PSIA @ P. T.	<b>1.0</b>	SUCT. PRESS., PSIG	<b>0</b>										
7	VISC. @ P. T., CKS	<b>1.0</b>	DIFF. PRESS., PSI	<b>30</b>										
8	CORR./ EROS. FROM	<b>SAND, GRIT</b>	DIFF. HEAD, FT**	<b>70</b>										
9	NPSH AVAILABLE			<b>20'</b>										
10	PCT. & SIZE SOLIDS	<b>&lt; 1%</b>	(TO PUMP INLET FACE)											
PERFORMANCE														
13	PROPOSAL CURVE NO.	MIN CONT. GPM												
14	SPEED, RPM	% EFF. @ RATED GPM												
15	NPSHR, FT H2O	BHP @ RATED GPM												
16	SHUT OFF HEAD, FT	MAX BHP												
17	MAX ALLOW. CASING PSIA	HYDROSTATIC TEST PSIG												
18	MAX. ALLOW. TEMP, DEG F	MIN SUBMERGENCE REQ'D IN.												
19	MAX. POSS. DISCH. PRESS, PSIG													
CONSTRUCTION														
21	IMPELLER DIA, IN RATED	MAX	MIN	TYPE	PUMP SETTING									
22	WEAR RINGS	<input type="checkbox"/>	CASING	<input type="checkbox"/>	IMPELLER	<input type="checkbox"/>	INLET	<input type="checkbox"/>	BACK	DEPTH, SUMP <b>14'-0"</b> IN				
23	UPPER BEARINGS	TYPE	<b>BALL</b>	LUBE	<b>GREASE</b>			CONNECTIONS						
24	INTERMEDIATE BRGS, TYPE	NO.	LUBE											
25	COUPLING: MFR	TYPE, SIZE						SIZE, INCHES						
26	DRIVER HALF MOUNTED BY	<input checked="" type="checkbox"/>	PUMP MFR	<input type="checkbox"/>	DRIVER MFR	RATING/FACING								
27	SHAFT SEAL TYPE	<input checked="" type="checkbox"/>	PACKING	<input type="checkbox"/>	MECHANICAL	<input type="checkbox"/>	NONE	DRIVER						
28	PACKING: MFR, TYPE	SIZE						FURN. BY	<input checked="" type="checkbox"/>	PUMP MFR	<input type="checkbox"/>	OTHERS		
29	NO. RINGS	<input checked="" type="checkbox"/>	GREASE LUBRICATED						MTD. BY	<input checked="" type="checkbox"/>	PUMP MFR	<input type="checkbox"/>	OTHERS	
30	SEAL (EXT. MOUNT. PUMP)	MFR	TYPE						<input checked="" type="checkbox"/>	MOTOR: ITEM NO. <b>A, B</b>	TYPE <b>IND.</b>			
31				HP	RPM									
32	INSTALLATION	<input type="checkbox"/>	SUBMERGED	<input checked="" type="checkbox"/>	EXTERNALLY MOUNTED						S. F.	<b>1.15</b>	ENCL.	<b>TEFC</b>
33	MOUNTING PLATE						REFER TO PAGE	ATTACHED						
34	ROTATION, LOOKING DOWN	<input type="checkbox"/>	CW	<input type="checkbox"/>	CCW						<b>V. 460 PH. 3 HZ 60</b>			
35						REFER TO PAGE,	ATTACHED							
SITE AND UTILITIES								WEIGHTS, LB, EACH						
37	<input type="checkbox"/>	INDOORS	<input checked="" type="checkbox"/>	OUTDOORS: AMBIENT TEMP, DEG F	<b>92</b> MAX.	<b>-10</b> MIN.	PUMP					MOUNTING PL.		
38	ALT. FT.	<b>1000</b>	AREA CLASS	GROUP	DIV		MOTOR					TURBINE		
39	<input checked="" type="checkbox"/>	NON HAZARDOUS	SWITCH ENCL.		<b>WP</b>									
TESTS				REQ'D WITN CERT	MATERIALS				ACCESSORIES FURN. BY PUMP MFR.					
41	SHOP INSP.	<input checked="" type="checkbox"/>	CASING	<b>C.I.</b>				<input checked="" type="checkbox"/>	SUCT. STRAINER	<input type="checkbox"/>	STEAM JACKET			
42	PERF.	<input checked="" type="checkbox"/>	IMPELLER	<b>C.I.</b>				<input type="checkbox"/>	FLOAT OPER. LEVEL SWITCH					
43	NPSHR	<input type="checkbox"/>	SHAFT					<input type="checkbox"/>	SUMP TANK (SEE DATA SHT. PG.)					
44	HYDRO	<input checked="" type="checkbox"/>	DISCH. PIPE					<input type="checkbox"/>	START-STOP	<input type="checkbox"/>	ALTERNATOR			
45				STRAINER					<input checked="" type="checkbox"/>	<b>SOLE PLATE</b>				
46	*DENOTES PRESSURE AT COLUMN DISCHARGE FLG. AT PUMP DISCH.							APPLICABLE DOCUMENTS						
47	**TOTAL DYNAMIC HEAD INCL. COLUMN HEIGHT ABOVE MIN. LEVEL							<input checked="" type="checkbox"/>	<b>1910-1300A</b>		<input type="checkbox"/>			
48								<input checked="" type="checkbox"/>	<b>1910-31A3</b>					
49								<input checked="" type="checkbox"/>	<b>1910-38A6</b>					
50								<input type="checkbox"/>						
51								<input type="checkbox"/>						
BY	<b>C.A.A.</b>		P. O.	VENDOR										



FORM NO. 135-304A



SECTION 2700  
WASTE WATER TREATMENT



REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2730A/B</b>		<b>27-1910-1311-N</b>		<b>5 AUG 80</b>	
MATERIAL <b>CENTRIFUGAL PUMP</b>		NO. REQ'D. <b>2</b>		C1	<b>6 Nov. 80</b>	C4	
SERVICE <b>BRINE PUMPS</b>				C2	<b>29 Dec. 80</b>	C5	
MFR.		MODEL		C3	<b>6 Feb. 81</b>	C6	
SIZE							
1 OPERATING CONDITIONS, EACH PUMP				PERFORMANCE			
2 LIQUID <b>BRINE (CaSO<sub>4</sub>) 1.3% SOLIDS</b> GPM RATED <b>50.</b>				PROPOSAL CURVE NO.			
3 PUMPING TEMP DEG F <b>214</b> U. S. GPM NORMAL <b>50.</b>				SPEED RPM		NO. STAGES	
4 MAX. P. T. DEG F <b>220.</b> MAX SUCTION PSIG <b>6</b>				NPSHR, FT (H <sub>2</sub> O)		MIN CONT. GPM	
5 S. G. AT PT <b>1.2 (1.0 MIN.)</b> DISCH. PRESS. PSIG <b>40</b>				SHUTOFF HD. FT		% EFF. @ RATING	
6 VAP. PRESS., PSIA @ PT <b>14.0</b> SUCT. PRESS., PSIG <b>0.</b>				BHP @ RATED GPM		MAX BHP	
7 VISC. @ PT, CKS <b>~5.</b> DIFF. PRESS., PSI <b>40</b>				IMPELLER DIA. IN		RATED MAX MIN	
8 CORR./ EROS. FROM <b>SALT</b> DIFF. HEAD, FT <b>92</b>				MAX. ALLOW. CASING PSIG/DEG F			
9 <b>CRYSTALS</b> NPSH AVAIL, FT <b>10</b>				HYDROSTATIC TEST PRESS. PSIG			
10 PCT & SIZE SOLIDS <b>1.3%</b>				MAX POSSIBLE DISCH. PRESS. PSIG			
11 CONSTRUCTION				ROTATION FACING COUPLING <input type="checkbox"/> CW <input type="checkbox"/> CCW			
12 CASING SPLIT <input type="checkbox"/> AXIAL <input checked="" type="checkbox"/> RADIAL				CONNECTIONS		SUCTION DISCHARGE	
13 CASING VOLUTE <input checked="" type="checkbox"/> SINGLE <input type="checkbox"/> DOUBLE <input type="checkbox"/> DIFFUSER				SIZE, INCHES			
14 CASING SUPPORT <input checked="" type="checkbox"/> FOOT <input type="checkbox"/> CENTERLINE				RATING/FACING		<b>150° RF 150° RF</b>	
15 <input type="checkbox"/> BRACKET <input type="checkbox"/> VERTICAL IN-LINE				LOCATION		<b>END TOP</b>	
16 CASING CONNS. <input checked="" type="checkbox"/> VENT <input checked="" type="checkbox"/> DRAIN <input type="checkbox"/> GAUGE <input type="checkbox"/>				DRIVER			
17 IMPELLER TYPE				FURNISHED BY <input type="checkbox"/> PUMP MFR <input checked="" type="checkbox"/> OTHERS			
18 IMPELLER MTG. <input type="checkbox"/> BETWEEN BRGS <input checked="" type="checkbox"/> OVERHUNG				MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
19 WEAR RINGS <input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK				<input checked="" type="checkbox"/> MOTOR: ITEM NO. <b>P-2730A/B</b> TYPE <b>HDR, IND.</b>			
20 BEARINGS-TYPE: RADIAL <b>BALL</b> THRUST <b>DEL. BALL CONTACT</b>				HP RPM		FRAME NO.	
21 BEARINGS-LUBE: <input checked="" type="checkbox"/> RING <input type="checkbox"/> FLOOD <input type="checkbox"/> FLINGER				ENCL		INSUL. S. F.	
22 <input type="checkbox"/> OIL MIST <input type="checkbox"/> PRESSURE LUBE				MFR		V PH HZ	
23 COUPLING: MFR TYPE GUARD TYPE				FLA		LRA LUBE	
24 DRIVER HALF MTD BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR <input type="checkbox"/> OTHERS				THRUST (VERT) LB		UP DOWN	
25 SHAFT SEAL TYPE <input type="checkbox"/> PACKING <input checked="" type="checkbox"/> MECHANICAL				<input type="checkbox"/> TURBINE: ITEM NO. — MFR.			
26 PACKING MFR, TYPE SIZE NO. RINGS				REFER TO PAGE ATTACHED			
27 SEAL MFR, MODEL TYPE				TESTS REQUIRED WITNESSED CERTIFIED			
28 MFR, CODE API CODE				SHOP INSPECT <input checked="" type="checkbox"/>			
29 BASEPLATE <input checked="" type="checkbox"/> EXTENDED FOR DRIVER <input type="checkbox"/> DRAIN RIM				PERFORMANCE <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>			
30				NPSHR <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
31 WATER COOLING & SEAL FLUSH PIPING				HYDROTEST <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>			
32 WATER COOLED <input type="checkbox"/> BEARINGS <input type="checkbox"/> STUFFING BOX JACKET				<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
33 <input type="checkbox"/> GLAND <input type="checkbox"/> PEDESTALS				MATERIALS-API CLASS			
34 C. W., PLAN WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE				CASING <b>ALLOY 20</b>		IMPELLER <b>ALLOY 20</b>	
35 TOTAL COOLING WATER REQUIRED, GPM				SHAFT SLEEVE			
36 SEAL FLUSH, PLAN <b>32</b> WITH <input type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> TUBING <input checked="" type="checkbox"/> PIPE				WEAR RINGS GLAND			
37 EXT. FLUSH, LIQUID @ DEG F GPM PSIG							
38				BASEPLATE <b>FAB. STL.</b>			
39 ACCESSORIES FURNISHED BY PUMP MFR				WEIGHTS, LBS EACH			
40 <input checked="" type="checkbox"/> SEAL FLUSH PIPING <input type="checkbox"/> STEAM JACKETING				PUMP		BASEPLATE	
41 <input type="checkbox"/> COOLING WATER PIPING <input type="checkbox"/>				MOTOR			
42 <input type="checkbox"/> OIL PIPING <input type="checkbox"/>				TURBINE			
43 <input type="checkbox"/> MINIMUM FLOW ORIFICE <input type="checkbox"/>				SITE & UTILITIES			
44				<input checked="" type="checkbox"/> INDOORS <input type="checkbox"/> OUTDOORS <input type="checkbox"/> UNPROTECTED			
45				AMBIENT <b>92</b> DEG F MAX TO <b>-10</b> DEG F MIN			
46				CL GR DIV <input checked="" type="checkbox"/> NON-HAZARDOUS			
47				ALT. FT <b>1000</b> COOLING WATER SOURCE			
48				DEG F: IN. OUT: PSIG IN. OUT			
49				APPLICABLE DOCUMENTS			
50				<input checked="" type="checkbox"/> <b>1910-1300A</b>			
51				<input checked="" type="checkbox"/> <b>1910-31A3</b> <input type="checkbox"/>			
BY <b>SS</b>		P. O.		VENDOR			

FORM NO. 135-302 A

NOTES



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION PAGE 1 OF 1

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2731 A, B</b>		<b>27-1910-1311-P</b>		<b>5 AUG. 80</b>	
MATERIAL <b>VERTICAL TURBINE PUMP</b>				C1	<b>6 NOV. 80</b>	C4	
SERVICE <b>SANITARY EFFLUENT PUMP</b>				C2	<b>29 DEC. 80</b>	C5	
MFR. NO. REQUIRED <b>2</b>				C3	<b>6 FEB. 81</b>	C6	
1 OPERATING CONDITIONS, EACH PUMP							
2	Liquid	<b>WATER</b>	U.S. GPM, Rated	<b>30</b>			
3	Pumping Temp. Deg. F	<b>AMB.</b>	U.S. GPM, Normal	<b>15</b>			
4	Max. P.T. Deg. F	<b>100</b>	Disch. Press., PSIG *	<b>82</b>			
5	S.G. @ P.T.	<b>1.0</b>	Pump Length, In.				
6	Vap. Press., PSIA @ P.T.	<b>1.0</b>	Min. Water Level, In.	<b>1'-0"</b>			
7	Visc. @ P.T., <del>CP</del> <b>CMS 1.0</b>		Max. Water Level, In.	<b>7'-6"</b>			
8	<b>BIOLOGICAL SOLIDS, 200 PPM</b> * At Pump Discharge Flange						
9	PERFORMANCE						
10	Efficiency, %		Perf. Curve No.				
11	Total Bowl Head, Ft.		NPSHR, Ft.				
12	BHP @ Rated GPM **		Min. Subm. Req'd. (E) In.				
13	Speed, RPM		Bowl Max. W.P. PSIG				
14	Max. BHP		Bowl Hydrotest, PSIG				
15	Min. Contin. GPM		Disch. Head W.P., PSIG				
16	Shutoff Head, Ft.		Disch. Head Hydro, PSIG				
17	Max. Disch. Press, PSIG						
18	** Incl. All Internal Losses						
19 CONSTRUCTION							
20	Model/Size		Rotation From Top <input type="checkbox"/> CW <input type="checkbox"/> CCW				
21	No. Stages		Disch. Head <input type="checkbox"/> Above <input type="checkbox"/> Below Floor				
22	Bowl Dia. In.		Column Assbly. <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed	A <b>8'-0"</b>			
23	Imp. Dia. In.		Bowl Assembly <input type="checkbox"/> Flanged <input type="checkbox"/> Screwed	B			
24	Imp. Type		No. Line Shaft Brgs.	C			
25	Bowl Shaft Dia. In.		Line Shaft <input type="checkbox"/> Open <input type="checkbox"/> Enclos.	D			
26	Line Shaft Dia. In.		Packing Type No. Rings	I			
27	Column Dia. In.		Line Shaft Lube				
28	Max. Thrust Lbs., Down		Coupling Mfr.				
29	Up		Type				
30 MATERIALS OF CONSTRUCTION <b>I-1</b>				DIMENSIONS, INCHES			
31	Bowl	<b>C.I.</b>	Impeller	<b>C.I.</b>	E	WEIGHT, LBS. EACH	
32	Bowl Wear Rings		Imp. Wear Ring		F	Pump	
33	Bowl Shaft		Line Shaft		G	Motor	
34	Bowl Bearings		Line Shaft Brgs.		H	ACCESSORIES FURN. BY PUMP MFR.	
35	Disch. Head		Head Shaft		I	<input checked="" type="checkbox"/> Soleplate	
36	Column		Suction Strainer			<input checked="" type="checkbox"/> Suction Strainer	
37						<input type="checkbox"/> Air Release Valve	
38	DRIVER			TESTS			
39	<input checked="" type="checkbox"/> Furn. By Pump Mfr.		Shipped <input checked="" type="checkbox"/> Mounted <input type="checkbox"/> Separate	REQ'D.	WITN.	CERT.	
40	<input checked="" type="checkbox"/> Motor: Item <b>P-2731 A, B</b>		Type <b>VERT. IND.</b>	Shop Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41	Mfr.		<input type="checkbox"/> Hollow Shaft <input type="checkbox"/> Solid Shaft	Hydrotest	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42	HP	RPM	<input type="checkbox"/> Non-Reverse Ratchet	Performance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43	Encl. <b>TEFC</b> Frame		Insul. <b>B or F</b> Lubr. Type	NPSHR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44	<b>V 460 PH 3 HZ 60 SF 1.15 LRA</b>		FLA	APPLICABLE DOCUMENTS			
45	<input type="checkbox"/> Refer to Page		Attached for Other Type Drivers	<b>1910-1300A</b>			
46 SITE DATA				<b>1910-31A3</b>			
47	<input type="checkbox"/> Indoor <input type="checkbox"/> Outdoor	Amb. Temp. Deg. F	Max. Min.	<b>1910-38A6</b>			
48	<input type="checkbox"/> Area Class	<b>GRP</b>	DIV <input type="checkbox"/> Non-Hazardous				
49	Altitude, Ft.		Switch Encl. <input type="checkbox"/> WP <input type="checkbox"/> XP				
50							
51							
BY <b>SJ</b>		P. O.		VENDOR			

FORM NO. 135-335



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 1

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2733</b>		<b>27-1910-1314-D</b>		<b>23 JAN, 81</b>	
MATERIAL <b>PROPORTIONING PUMPS</b>				C1		C4	
<b>EVAPORATOR CONDITIONING PUMP</b>				C2		C5	
NO. REQ'D. <b>ONE</b>				C3		C6	
MFR:		MODEL					
PROCESS REQUIREMENTS		PUMP DRIVER (By Pump Mfr.)		PACKAGE UNIT			
2	LIQUID <b>66 BAUME H<sub>2</sub>SO<sub>4</sub></b>			<input type="checkbox"/> REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED			
3	TEMP., °F <b>AMB., MAX. = 95</b>	MFR.		TANK (With Legs & Pump Platform)			
4	SP. GR. <b>1.8</b>	HP ; S.F. <b>1.15</b>		U. S. GAL. CAPACITY			
5	NPSHA, Ft. <b>20+</b>	RPM ; FRAME		MATERIAL			
6	U. S. GPH: MAX. <b>20</b>	V./PH./Hz <b>115/1/60</b>		TYPE COVER			
7	MIN. <b>0.2</b>	ENCLOSURE		TYPE BOTTOM			
8	MIN. REQ'D. CONTROL	TYPE		<input type="checkbox"/> DIA. x HEIGHT			
9	DISCH. PSIG <b>10</b>	INSUL. CLASS <b>B<sub>4</sub></b> & <b>F<sub>2</sub></b> °C RISE		<input type="checkbox"/> TOTAL UNIT WEIGHT			
10	SUCT. PSIG <b>0</b>	F. L. AMPS.		<input type="checkbox"/> MIXER BRACKET			
11	DIFF. PSI <b>10</b>	L. R. AMPS.		<input type="checkbox"/> FILL CONN. 1			
PUMP DATA		GEAR		<input type="checkbox"/> FILL CONN. 2			
13	TYPE <input type="checkbox"/> PLUNGER <input checked="" type="checkbox"/> DIAPHRAGM	MFR.		<input type="checkbox"/> OVERFLOW CONN.			
14	NO. OF HEADS	TYPE		<input type="checkbox"/> DRAIN CONN.			
15	PLUNGER DIA.			<input type="checkbox"/> PLUGGED <input type="checkbox"/> VALVED			
16	MAX. STROKE	COUPLING		<input type="checkbox"/> GAGE GLASS CONNS			
17	U. S. GPH MAX.	MFR.		<input type="checkbox"/> GAGE & COCKS			
18	MIN.	TYPE		<input type="checkbox"/> HEATER			
19	MWP PSIG	MODEL		VOLTS PH HZ			
20	HYDROTEST PSIG			<input type="checkbox"/> LEVEL CONTROL			
21	PSV SET PSIG	(Guards Req'd. for all Exposed Moving Parts)		<input type="checkbox"/> FLOAT <input type="checkbox"/> SWITCH			
22	NPSHR, Ft.	DISSOLVING BASKET		MIXER (AGITATOR)			
23	MAX. TEMP. °F	<input type="checkbox"/> REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED		<input type="checkbox"/> REQUIRED <input checked="" type="checkbox"/> NOT REQUIRED			
24	NET GPH REQ'D.	MATERIAL		MFR.			
25	CONTROL METHOD (NOTE 3)	SHOP TESTS		MODEL			
26		REQ'D. WITNESSED		MOUNT METHOD			
27	CHECKS: TYPE	PUMP MECH. RUN	<input type="checkbox"/>	<input type="checkbox"/>	SHAFT MAT'L.		
28	NO. PER VALVE	CHECK CONTROLS	<input type="checkbox"/>	<input type="checkbox"/>	IMPELLER MAT'L.		
29	PACKING TYPE	SET PSV	<input type="checkbox"/>	<input type="checkbox"/>	DRIVER	HP	RPM
30	SUCTION: SIZE		<input type="checkbox"/>	<input type="checkbox"/>	VOLTS	PH	HZ
31	RATING				TYPE ENCL.		
32	DISCHARGE: SIZE				INSUL. CLASS °C RISE		
33	RATING				AMPS.	FL	LR
PUMP MATERIALS		SITE DATA		PIPING SYSTEM			
35	CYLINDER OR HEAD	<input checked="" type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR		MATERIAL			
36	PLUNGER	<input type="checkbox"/> CLASS GR DIV		SIZE/RATING			
37	DIAPHRAGM <b>TEFLON</b>	<input checked="" type="checkbox"/> NON-HAZARDOUS		SUCT. PIPE <b>150<sup>#</sup></b>			
38	VALVES: CHECKS	AMBIENT. °F MAX. <b>92</b> MIN. <b>-10</b>		DISCH. PIPE <b>150<sup>#</sup></b>			
39	SEATS			PSV DISCH. PIPE			
40	BODY	APPLICABLE DOCUMENTS		W/ SUCT. STRAINER			
41		GENERAL NOTES <b>1910-1300A</b>		W/SUCT. DRAIN			
42		MOTOR SPEC. <b>1910-38A6</b>		<input type="checkbox"/> SUCT. BLOCK VALVE			
43				<input type="checkbox"/> DISCH. BLOCK VALVE			
44							
45	NOTES	1. THE PUMP IS TO HAVE AN INTERNAL PRESSURE RELIEF VALVE					
46		2. LIQUID VISCOSITY IS 14 TO 50 CKS					
47		3. PUMP TO RECEIVE PNEUMATIC SIGNAL FOR AUTOMATIC STROKE					
48		ADJUSTMENT					
49							
50							
51							
BY	<b>SJ</b>		P. O.		VENDOR		

FORM NO. 135-309B



**REQUISITION**  
**FOSTER WHEELER ENERGY CORPORATION**

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>P-2734 A,B</b>		<b>27-1910-1311-R</b>		<b>23 JAN. 81</b>	
MATERIAL <b>CENTRIFUGAL PUMP</b>		NO. REQ'D. <b>TWO</b>		C1		C4	
SERVICE <b>EVAPDRATOR FEED PUMP</b>				C2		C5	
MFR.		MODEL		C3		C6	
1 OPERATING CONDITIONS, EACH PUMP				PERFORMANCE			
2 LIQUID BFW WASTEWATER U.S. GPM RATED <b>250</b>		U.S. GPM NORMAL <b>157</b>		PROPOSAL CURVE NO.			
3 PUMPING TEMP DEG F <b>AMB</b>		U.S. GPM NORMAL <b>157</b>		SPEED RPM		NO. STAGES <b>1</b>	
4 MAX. P T, DEG F <b>95</b>		MAX SUCTION PSIG <b>13</b>		NPSHR, FT (H <sub>2</sub> O)		MIN CONT. GPM	
5 S. G. AT PT <b>1.0</b>		DISCH. PRESS. PSIG <b>40</b>		SHUTOFF HD. FT		% EFF. @ RATING	
6 VAP. PRESS., PSIA @ PT <b>1.0</b>		SUCT. PRESS., PSIG <b>0</b>		BHP @ RATED GPM		MAX BHP	
7 VISC. @ PT, @ <b>1.05 cks</b>		DIFF. PRESS., PSI <b>40</b>		IMPELLER DIA. IN		RATED MAX MIN	
8 CORR./ EROS. FROM		DIFF. HEAD, FT <b>92.4</b>		MAX. ALLOW. CASING PSIG/DEG F		/	
9		NPSH AVAIL, FT <b>20+</b>		HYDROSTATIC TEST PRESS. PSIG			
10 PCT & SIZE SOLIDS				MAX POSSIBLE DISCH. PRESS. PSIG			
11 CONSTRUCTION				ROTATION FACING COUPLING <input type="checkbox"/> CW <input type="checkbox"/> CCW			
12 CASING SPLIT <input type="checkbox"/> AXIAL <input checked="" type="checkbox"/> RADIAL				CONNECTIONS		SUCTION DISCHARGE	
13 CASING VOLUTE <input checked="" type="checkbox"/> SINGLE <input type="checkbox"/> DOUBLE <input type="checkbox"/> DIFFUSER				SIZE, INCHES			
14 CASING SUPPORT <input checked="" type="checkbox"/> FOOT <input type="checkbox"/> CENTERLINE				RATING/FACING		<b>125" FF 125" FF</b>	
15 <input type="checkbox"/> BRACKET <input type="checkbox"/> VERTICAL IN-LINE				LOCATION		<b>END TOP</b>	
16 CASING CONNS. <input checked="" type="checkbox"/> VENT <input checked="" type="checkbox"/> DRAIN <b>3/4"</b>				DRIVER			
17 IMPELLER TYPE				FURNISHED BY <input type="checkbox"/> PUMP MFR <input checked="" type="checkbox"/> OTHERS			
18 IMPELLER MTG. <input type="checkbox"/> BETWEEN BRGS <input checked="" type="checkbox"/> OVERHUNG				MOUNTED BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS			
19 WEAR RINGS <input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK				<input checked="" type="checkbox"/> MOTOR: ITEM NO. <b>A, B</b> TYPE			
20 BEARINGS-TYPE: RADIAL <b>BALL</b> THRUST <b>DBL. AND CONTACT</b>				HP RPM		FRAME NO.	
21 BEARINGS-LUBE: <input checked="" type="checkbox"/> RING <input type="checkbox"/> FLOOD <input type="checkbox"/> FLINGER				ENCL. INSUL.		S. F.	
22 <input type="checkbox"/> OIL MIST <input type="checkbox"/> PRESSURE LUBE				MFR V PH HZ			
23 COUPLING: MFR <b>KOPPERS</b> TYPE GUARD TYPE				FLA LRA LUBE			
24 DRIVER HALF MTD BY <input checked="" type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR <input type="checkbox"/> OTHERS				THRUST(VERT) LB UP DOWN			
25 SHAFT SEAL TYPE <input type="checkbox"/> PACKING <input checked="" type="checkbox"/> MECHANICAL				<input type="checkbox"/> TURBINE: ITEM NO. --- MFR.			
26 PACKING MFR, TYPE SIZE NO. RINGS				REFER TO PAGE ATTACHED			
27 SEAL MFR, MODEL <b>B-W</b> TYPE <b>BX</b>				TESTS REQUIRED WITNESSED CERTIFIED			
28 MFR, CODE <b>5N1X</b> API CODE				SHOP INSPECT <input checked="" type="checkbox"/>			
29 BASEPLATE <input checked="" type="checkbox"/> EXTENDED FOR DRIVER <input checked="" type="checkbox"/> DRAIN RIM				PERFORMANCE <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>			
30				NPSHR <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
31 WATER COOLING & SEAL FLUSH PIPING				HYDROTEST <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>			
32 WATER COOLED <input type="checkbox"/> BEARINGS <input type="checkbox"/> STUFFING BOX JACKET				<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
33 <input type="checkbox"/> GLAND <input type="checkbox"/> PEDESTALS				MATERIALS API CLASS <b>I-1</b>			
34 C. W., PLAN, WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE				CASING <b>C1</b>		IMPELLER <b>C1</b>	
35 TOTAL COOLING WATER REQUIRED, GPM				SHAFT SLEEVE			
36 SEAL FLUSH, PLAN <b>II</b> , WITH <input checked="" type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input checked="" type="checkbox"/> PIPE				WEAR RINGS GLAND			
37 EXT. FLUSH, LIQUID @ DEG F GPM PSIG				BASEPLATE <b>FAB, STL.</b>			
38				WEIGHTS, LBS EACH			
39 ACCESSORIES FURNISHED BY PUMP MFR				PUMP BASEPLATE		MOTOR TURBINE	
40 <input checked="" type="checkbox"/> SEAL FLUSH PIPING <input type="checkbox"/> STEAM JACKETING				SITE & UTILITIES			
41 <input type="checkbox"/> COOLING WATER PIPING <input type="checkbox"/>				<input type="checkbox"/> INDOORS <input checked="" type="checkbox"/> OUTDOORS <input type="checkbox"/> UNPROTECTED			
42 <input type="checkbox"/> OIL PIPING <input type="checkbox"/>				AMBIENT <b>92</b> DEG F MAX TO <b>-10</b> DEG F MIN			
43 <input type="checkbox"/> MINIMUM FLOW ORIFICE <input type="checkbox"/>				CL GR DIV <input checked="" type="checkbox"/> NON-HAZARDOUS			
44				ALT. FT <b>1000</b> COOLING WATER SOURCE			
45				DEG F: IN, OUT: PSIG IN, OUT			
46				APPLICABLE DOCUMENTS			
47				<input checked="" type="checkbox"/> <b>1910-1300A</b> <input type="checkbox"/>			
48				<input checked="" type="checkbox"/> <b>1910-31A3</b> <input type="checkbox"/>			
49							
50							
51							
BY <b>SJ</b>		P. O.		VENDOR			

FORM NO. 135-302 A

NOTES

# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION



CLIENT <i>CONDO / DOE</i>		CONTRACT <i>15-1910</i>		REQUISITION		DATE	
SITE <i>NOBLE COUNTY, OHIO</i>				<i>27-1910-1381A</i>		<i>10 Feb 81</i>	
MATERIAL <i>SQUIRREL CAGE INDUCTION MOTOR(S)</i>				C1		C4	
				C2		C5	
MANUFACTURER				C3		C6	
1	ITEM(S)	<i>PM-2719A/B</i>	<i>PM-2724A/B</i>	<i>PM-2730A/B</i>	<i>PM-2734A/B</i>		
2							
3	QUANTITY	<i>2</i>	<i>2</i>	<i>2</i>	<i>2</i>		
4	HORIZONTAL(H) OR VERTICAL(V)	<i>H</i>	<i>H</i>	<i>H</i>	<i>H</i>		
5	DRIVEN EQUIPMENT	<i>CENTRIF. PUMP</i>	<i>CENTRIF. PUMP</i>	<i>CENTRIF. PUMP</i>	<i>CENTRIF. PUMP</i>		
6	NAMEPLATE HP						
7	SERVICE FACTOR	<i>1.15</i>	<i>1.15</i>	<i>1.15</i>	<i>1.15</i>		
8	FL RPM/NO. OF POLES	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>		
9	VOLTS/PH/Hz	<i>460   3   60</i>	<i>460   3   60</i>	<i>460   3   60</i>	<i>460   3   60</i>		
10	ENCLOSURE TYPE	<i>TEFC</i>	<i>TEFC</i>	<i>TEFC</i>	<i>TEFC</i>		
11	°C RISE/40° C @ SF LOAD						
12	INSULATION CLASS	<i>B0RF</i>	<i>B0RF</i>	<i>B0RF</i>	<i>B0RF</i>		
13	THERMAL PROTECTOR TYPE						
14	NEC. TEMP. IDENT. NO.						
15	FRAME SIZE NO.						
16	MOUNTING ASSEMBLY						
17	ROTATION FROM END OPPOS. CPLG.						
18	BEARINGS TYPE	<i>Ball</i>	<i>Ball</i>	<i>Ball</i>	<i>Ball</i>		
19	LUBRICATION	<i>GREASE</i>	<i>GREASE</i>	<i>GREASE</i>	<i>GREASE</i>		
20	NEMA LR CODE						
21	NEMA DESIGN						
22	AMPS., FL./LR.	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>		
23	THRUST CAPACITY., LBS.: DOWN						
24	UP						
25	% EFFIC. 100%/75%/50% LOAD	<i>1   1</i>	<i>1   1</i>	<i>1   1</i>	<i>1   1</i>		
26	% P. F. 100%/75%/50% LOAD						
27	NOISE LEVEL (dBA @ 3FT.)						
28	SPECIAL REQUIREMENTS:						
29	MOUNT HALF-COUPLING	<i>PUMP VENDOR</i>	<i>PUMP VENDOR</i>	<i>PUMP VENDOR</i>	<i>PUMP VENDOR</i>		
30	SPACE HEATERS WATTS	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>		
31	VOLTS/PH/Hz	<i>1   1</i>	<i>1   1</i>	<i>1   1</i>	<i>1   1</i>		
32	SLIDE BASE FOR BELT DRIVE						
33	<i>HIGH EFFCY TYPE</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>		
34							
35	WEIGHT:						
36	MOTOR & (IF APPLIC.) BASE						
37	TESTS:						
38	N. E. M. A. STD. COMMERCIAL						
39	PER MOTOR SPECIFICATION	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>		
40	TEST CERTIFICATES REQUIRED						
41	NOTES:						
42							
43							
44							
45	APPLICABLE DOCUMENTS:	BASIC DESIGN DATA:					
46	MOTOR SPECIFICATION <i>1910-38A6</i>	AMBIENT <i>92</i> °F, MAX. <i>-10</i> °F, MIN.					
47		LOCATION <input type="checkbox"/> INDOOR <input type="checkbox"/> UNHEATED					
48		<input checked="" type="checkbox"/> OUTDOOR <input type="checkbox"/> UNPROTECTED					
49	NOISE CONTROL SPEC.	ELEC. AREA <input type="checkbox"/> CL GRP DIV.					
50	PREP. FOR SHIP'T. SPEC. <i>1910-97A1</i>	<input checked="" type="checkbox"/> NON-HAZARDOUS					
51	GENERAL NOTES REQ'N. <i>1910-1300A</i>	ALTITUDE, FT. <i>1000</i>					
BY <i>CAA</i>	P. O.	VENDOR					

FORM NO. 135-323C



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	CL-2702	27-1910-1942A	5 Aug 80
MATERIAL	Activated Sludge Clarifier			C1	17 Sep 80
OR				C2	6 Feb 81
SERVICE				C3	C4

Procure materials, design, engineer and submit drawings for approval; after approval, fabricate, test and furnish all equipment required for one activated sludge clarifier to meet the requirements set forth herein,

**I. GENERAL**

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:
 

Mr. Joseph J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468
- E. All equipment covered by this requisition will be located outdoors.
- F. The equipment shall be shop fabricated and shipped in the minimum number of pieces consistent with shipping limitations.

FORM NO. 135-801

BY	JJK	P.O. NO.	SUPPLIER
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# REQUISITION



PAGE 2 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942A
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### I. GENERAL (cont'd.)

G. The system of measurement shall be English.

#### H. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 10 of this requisition.

2. Other referenced drawings, specification, standards, and publications not listed on Page 10 are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

#### B. Codes

1. All equipment and/or materials shall be in accordance with all Governmental and local codes; laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this Requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

B. The following equipment and services will be provided by others:

1. Main supply line to Vendor's single flanged connection.
2. Main effluent line from Vendor's single flanged connection.
3. Main waste line from Vendor's single flanged connection.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 10

CHANGE NO.

2

DATE

6 Feb 81

REQUISITION NO.

27-1910-1942A

III. SCOPE OF WORK (cont'd.)

B. (cont'd.)

4. Electrical power, motor starters, cable.
5. Installation and erection of all equipment and piping.
6. Lighting.
7. All concrete work, foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
8. Sumps and sewers.
9. All finish painting.

C. The following equipment and services shall be provided by the vendor:

1. The activated sludge clarifier to be supplied by the vendor shall include but not necessarily be limited to the following equipment:
  - a. Design of the concrete shell and bottom, with concrete work by PURCHASER.
  - b. A structural steel bridge with platform and handrail to be shipped in one piece.
  - c. Rake mechanism to remove settled solids.
  - d. Effluent collector.
  - e. Desludging pipe, valves and controls.
  - f. All pipe connections shall be flanged.

FORM NO. 135-802



# REQUISITION



PAGE 4 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.

2

DATE 6 Feb 81

REQUISITION NO.

27-1910-1942-A

### III. SCOPE OF WORK (cont'd.)

#### D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items as required:
  - A. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - B. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).
  - C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).
2. The following items will be provided by the purchaser:
  - A. Electronic controllers.
  - B. Indicators.
  - C. Alarms.
  - D. Programmable controller digital logic.
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. PURCHASER tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

### IV. DESIGN DATA

- A. The activated sludge clarifiers shall be designed to clarify coal gasification effluent from an extended aeration activated sludge system.

FORM NO. 135-903



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942A
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### IV. DESIGN DATA (cont'd.)

#### A. (cont'd.)

##### 1. Influent Wastewater Flow Rate:

- a) Design rate ----- 225 gpm
- b) Normal rate ----- 152 gpm

2. Overflow rate at design flow ----- 600 GPD/FT.<sup>2</sup> (Max.)

3. Pressure ----- Atmospheric

4. Temperature ----- Ambient

##### 5. Design Ambient Conditions

- a) Winter ----- -10°F (Min.)
- b) Summer ----- 92°F (Max.)

#### B. Wastewater Analysis

##### 1. Influent

a) MLSS ----- 5000 mg/l  
 (MLSS will contain up to 2500 mg/l of powered activated carbon from the extended aeration activated sludge system).

##### 2. Effluent

a) TSS ----- not to exceed 30 mg/l

#### C. Utilities

##### 1. Electrical Equipment Utilization Voltage

Instruments: 115v/1Phase/60 Hz  
 Motors less than 1/2 HP: 115v/1Phase/60Hz  
 Motors 1/2-200 HP: 460v/3Phase/60Hz

Area classification: Non-Hazardous (Unclassified)

2. Air - plant and instrument air supplied at 100 psig, 100°F.

(C2) FORM NO. 135-902

# REQUISITION



PAGE 6 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2

DATE 6 Feb. 81

REQUISITION NO. 27-1910-1942A

### IV. DESIGN DATA (cont'd.)

#### D. Site Data

1. Elevation above sea level (ft) 1050 approx.
2. Winter design temperature ( $^{\circ}$ F) - 10.
3. Summer ambient temperature ( $^{\circ}$ F) 92 (Max.).

### V. EQUIPMENT DESIGN AND CONSTRUCTION

- A. As noted in Section I.F. above all fabricated steel shall be shipped in the minimum number of pieces and shall be marked for identification in the shop and cross referenced to the erection drawings.
- B. Overall height of sidewall shall be at least 14 feet.
- C. The unit shall be provided with a concrete shell, internals, platform with walkway and handrail, collecting launders and backflush, rake mechanism and desludging piping and controls. All piping connections shall be flanged.

### VI. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram showing vessels, pumps, piping and controls. This diagram shall clearly indicate the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) The following equipment data shall be completed and returned with the vendor's proposal.

FORM NO. 135-803



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 10

CHANGE NO. 2

DATE 6 Feb 81

REQUISITION NO. 27-1910-1942A

### VI. VENDOR'S BID INFORMATION (cont'd.)

#### f) (cont'd.)

1. Number of Units one
2. Dimensions \_\_\_\_\_
3. Materials of Construction
  - a) Shell Concrete
  - b) Floor Concrete
4. Thickness
  - a) Shell \_\_\_\_\_
5. Weights
  - a) Shipping \_\_\_\_\_ lb.
  - b) Flooded \_\_\_\_\_ lb.
6. Number of pieces shipped
  - a) Draft tubes \_\_\_\_\_
  - b) Launderers \_\_\_\_\_
  - c) Platform \_\_\_\_\_
7. Motors (See data sheet, pg 9).
8. Desludging Equipment
  - a) Components \_\_\_\_\_
  - b) Control \_\_\_\_\_
9. Overflow rate \_\_\_\_\_ gpm/ft.<sup>2</sup>
10. Detention time \_\_\_\_\_

FORM NO. 135-802



# REQUISITION

PAGE 8 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942A
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VI. VENDOR'S BID INFORMATION (cont'd.)

f) (cont'd.)

11. Nozzle size (Flanged)

- a) Inlet \_\_\_\_\_
- b) Outlet \_\_\_\_\_
- c) Overflow \_\_\_\_\_
- d) Drain \_\_\_\_\_
- e) Desludging \_\_\_\_\_
- f) Backflush \_\_\_\_\_
- g) Sample \_\_\_\_\_

VII. GUARANTEE

- A. The vendor shall guarantee that the clarifier, when installed and operated in accordance with his instructions will be capable of the following:
- 1. Treating the specified quantities of wastewater at the specified rate.
  - 2. Producing an effluent with a quality as required by this requisition with TSS not exceeding 30 mg/l under any conditions.
- B. For mechanical guarantee see the commercial papers.

FORM NO. 135-903

FORM 135-49

F.W.C. CONTRACT <u>15-1910</u>	REQUISITION NUMBER	DATE
FOR: <u>CONOCO / DOE</u>	<u>27-1910-1942A</u>	<u>5 AUG 80</u>
SITE: <u>NOBLE COUNTY, OHIO</u>	SUPERSEDED BY CHANGE NO.: <u>0</u>	
MANUFACTURER:	C1 <u>17 Sep 80</u> C3	C5
	C2 <u>16 Feb 81</u> C4	C6

**APPLICABLE DOCUMENTS:** PER P. 10

MOTOR SPECIFICATION \_\_\_\_\_  
 PREP. FOR SHIPMENT \_\_\_\_\_  
 GENERAL NOTES \_\_\_\_\_

**SITE DATA:**

ALTITUDE 1050 FT. BAROMETER 14.21 PSIA  
 AMBIENT 92 °F. MAX. TO -10 °F. MIN.  
 ATMOSPHERE  
 INSTALLED  INDOOR  OUTDOOR   
 AREA  CL.  -GR.  -DIV.  NON-HAZARDOUS.

ITEM NUMBERS:						
TOTAL QUANTITY						
DRIVEN EQUIPMENT						
HP NAMEPLATE RATING						
SERVICE FACTOR						
RPM AT FULL LOAD/ NO. POLES	/	/	/	/	/	/
VOLTS/PHASES/HERTZ	/	/	/	/	/	/
ENCLOSURE						
°C. RISE AT FULL S.F. LOAD						
TEMP. MEASUREMENT METHOD						
INSULATION CLASS						
INSUL. SPECIAL TREATMENT						
SPECIAL HARDWARE						
FRAME NUMBER						
MOUNTING ASSEMBLY NUMBER						
ROTATE FROM END OPP. CPLG.						
BEARINGS TYPE						
LUBRICATION						
END FLOAT (IF APPL.) INS.						
N.E.M.A. DESIGN LETTER						
AMPS.: F.L./LOCKED ROTOR	/	/	/	/	/	/
LOCKED ROTOR LIMIT, SECS.						
EFFIC, 100%/75%/50% LOAD	/	/	/	/	/	/
% P.F. 100%/75%/50% LOAD	/	/	/	/	/	/
<b>ACCESSORIES:</b>						
BASE						
SPACE HEATERS:      WATTS						
VOLTS/PH/Hz	/	/	/	/	/	/
TEMP. DETECTORS: NUMBER						
TYPE						
AIR FILTERS						
MOUNTING COUPLING HALF						
TESTS:      (W = WITNESSED)						
N.E.M.A. STD. COMMERCIAL						
TEST CERTIFICATES REQ'D.						
<b>WEIGHTS:</b> (LBS.)						
NET/GROSS	/	/	/	/	/	/
MAX. NORMAL MAINTENANCE						

# REQUISITION



PAGE 10 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2

DATE 6 Feb 81

REQUISITION NO. 27-1910-1942A

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

SPEC. NUMBER

TITLE

1910-38A6	Low Voltage NEMA Frame TEFC & XP Induction Motors
1910-38A7	Medium Voltage and Non-NEMA Frame Induction Motors
1910-40A1	Wind, Earthquake and Snow Loading
1910-40A2	Design Loadings for Equipment Structures & Foundations
1910-46A1	Structural Steel
1910-50A21.040	Piping Material Spec. "Lc"
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Systems
1910-83A1	Painting
1910-88C1	Welding Requirements
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

REQUISITION NUMBER

1910-1900A	General Notes for Miscellaneous Equipment
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FORM NO. 135-903



# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1942A

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

### Flow

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Venturi, Flow Nozzle, Etc.

B.I.F., Daniel Industries, Vickery-Simms





# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 1 OF 10

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	CL-2703	27-1910-1942 P	19 Dec. 80
MATERIAL	DAF Froth Thickener			C1 6Feb.81 C4	
OR				C2	C5
SERVICE				C3	C6

Procure materials, design, engineer and submit drawings for approval; after approval, fabricate, test and furnish all equipment required for one thickener to meet the requirements set forth herein.

**I. GENERAL**

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:
 

Mr. Joseph J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468
- E. All equipment covered by this requisition will be located outdoors, above grade.
- F. The equipment shall be shop fabricated and shipped in the minimum number of pieces consistent with shipping limitations.

FORM NO. 135-801

BY	JJK	P.O. NO.	SUPPLIER
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# REQUISITION

PAGE 2 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	1	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942 P
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### I. GENERAL (cont'd.)

- G. The system of measurement shall be English.
- H. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

- A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

- 1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 10 of this requisition.

- 2. Other referenced drawings, specification, standards, and publications not listed on Page 10 are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

- B. Codes

- 1. All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

- A. The vendor shall quote on the base system outlined in this Requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

- B. The following equipment and services will be provided by others:

- 1. Main supply line to Vendor's single flanged connection.
  - 2. Main effluent line from Vendor's single flanged connection.
  - 3. Main waste line from Vendor's single flanged connection.

FORM NO. 135-803



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 10

CHANGE NO. 1      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942 P

III. SCOPE OF WORK (cont'd.)

B. (cont'd.)

4. Electrical power, motor starters, cable.
5. Installation and erection of all equipment and piping.
6. Lighting.
7. All concrete work, foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
8. Sumps and sewers.
9. All finish painting.

C. The following equipment and services shall be provided by the vendor:

1. The thickener to be supplied by the vendor shall include but not necessarily be limited to the following equipment:
  - a. Design of the concrete shell and bottom, with concrete work by PURCHASER.
  - b. Supply of steel sidewalls.
  - c. A structural steel bridge with platform and handrail to be shipped in one piece.
  - d. Rake mechanism with motor drives to remove settled solids.
  - e. Effluent collector.
  - f. All pipe connections shall be flanged.
  - g. Center feedwell

FORM NO. 135-802



# REQUISITION

PAGE 4 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	1	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942-P
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### III. SCOPE OF WORK (cont'd.)

#### D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items as required:
  - A. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - B. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).
  - C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).
2. The following items will be provided by the purchaser:
  - A. Electronic controllers.
  - B. Indicators.
  - C. Alarms.
  - D. Programmable controller digital logic.
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. PURCHASER tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

#### IV. DESIGN DATA

- A. The clarifiers shall be designed to clarify froth from a dissolved air flotation system.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 10

CHANGE NO. 1      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942 P

## IV. DESIGN DATA (cont'd.)

### A. (cont'd.)

#### 1. Influent Wastewater Flow Rate:

- a) Design rate ----- 10 gpm
- b) Normal rate ----- 8 gpm

2. Design solids loading ----- 20 Lb/day/ft<sup>2</sup>

3. Pressure ----- Atmospheric

4. Temperature ----- Ambient

### B. Wastewater Analysis

#### 1. Influent

a) MLSS ----- 20,000 mg/l (max.)

### C. Utilities

#### 1. Electrical Equipment Utilization Voltage

Instruments: 115v/1Phase/60 Hz  
Motors less than 1/2 HP: 115v/1Phase/60Hz  
Motors 1/2-200 HP: 460v/3Phase/60Hz

Area classification: Non-Hazardous (Unclassified)

2. Air - plant and instrument air supplied at 100 psig, 100°F.

FORM NO. 135-902



# REQUISITION

PAGE 6 OF 10

**FOSTER WHEELER ENERGY CORPORATION**

CHANGE NO. 1

DATE 6 Feb. 81

REQUISITION NO. 27-1910-1942 P

## IV. DESIGN DATA (cont'd.)

### D. Site Data

1. Elevation above sea level (ft) 1050 approx.
2. Winter design temperature ( $^{\circ}$ F) - 10.
3. Summer ambient temperature ( $^{\circ}$ F) 92 (Max.).

## V. EQUIPMENT DESIGN AND CONSTRUCTION

- A. All fabricated steel shall be shipped in the minimum number of pieces and shall be marked for identification in the shop and cross referenced to the erection drawings.
- B. Overall height of sidewall shall be at least 12 feet.
- C. The unit shall be provided with a concrete bottom steel shell, internals, platform with walkway and handrail, collecting launders and rake mechanism. All piping connections shall be flanged.

## VI. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram showing vessels, pumps, piping and controls. This diagram shall clearly indicate the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) The following equipment data shall be completed and returned with the vendor's proposal.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 10

CHANGE NO. 1 DATE 6 Feb. 81 REQUISITION NO. 27-1910-1942 P

VI. VENDOR'S BID INFORMATION (cont'd.)

f) (cont'd.)

1. Number of Units one

2. Dimensions \_\_\_\_\_

3. Materials of Construction

a) Shell Carbon Steel

b) Floor Concrete

4. Thickness

a) Shell \_\_\_\_\_

5. Weights

a) Shipping \_\_\_\_\_ lb.

b) Flooded \_\_\_\_\_ lb.

6. Number of pieces shipped

a) Draft tubes \_\_\_\_\_

b) Launderers \_\_\_\_\_

c) Platform \_\_\_\_\_

7. Motors (See data sheet, pg 9).

8. Overflow rate \_\_\_\_\_ gpm/ft.<sup>2</sup>

9. Detention time \_\_\_\_\_

FORM NO. 135-902



# REQUISITION

PAGE 8 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	1	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942 P
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VI. VENDOR'S BID INFORMATION (cont'd.)

f) (cont'd.)

11. Nozzle size (Flanged)

- a) Inlet \_\_\_\_\_
- b) Outlet \_\_\_\_\_
- c) Overflow \_\_\_\_\_
- d) Drain \_\_\_\_\_
- e) Desludging \_\_\_\_\_
- f) Backflush \_\_\_\_\_
- g) Sample \_\_\_\_\_

VII. GUARANTEE

A. The vendor shall guarantee that the clarifier, when installed and operated in accordance with his instructions will be capable of treating the specified quantities of wastewater at the specified rate.

B. For mechanical guarantee see the commercial papers.

FORM NO. 135-903



FORM 135-49

F.W.C. CONTRACT <u>15-1910</u>	REQUISITION NUMBER	DATE
FOR: <u>CONOCO / DOE</u>	<u>27-1910-1942P</u>	<u>19 DEC. '80</u>
SITE: <u>NOBLE COUNTY, OHIO</u>	SUPERSEDED BY CHANGE NO.: <u>0</u>	
MANUFACTURER:	C1 <u>17Sep80</u> C3	C5
	C2 <u>6Feb81</u> C4	C6

APPLICABLE DOCUMENTS: PER Pg. 10

**SITE DATA:**

MOTOR SPECIFICATION _____	ALTITUDE <u>1050</u> FT. BAROMETER <u>14.21</u> PSIA
PREP. FOR SHIPMENT _____	AMBIENT <u>92</u> °F. MAX. TO <u>-10</u> °F. MIN.
GENERAL NOTES _____	ATMOSPHERE _____
	INSTALLED <input type="checkbox"/> INDOOR <input checked="" type="checkbox"/> OUTDOOR <input type="checkbox"/>
	AREA <input type="checkbox"/> CL. <input type="checkbox"/> -GR. <input type="checkbox"/> -DIV. <input checked="" type="checkbox"/> NON-HAZARDOUS.

**ITEM NUMBERS:**

TOTAL QUANTITY						
DRIVEN EQUIPMENT						
HP NAMEPLATE RATING						
SERVICE FACTOR						
RPM AT FULL LOAD/ NO. POLES	/	/	/	/	/	/
VOLTS/PHASES/HERTZ	/	/	/	/	/	/
ENCLOSURE						
°C. RISE AT FULL S.F. LOAD						
TEMP. MEASUREMENT METHOD						
INSULATION CLASS						
INSUL. SPECIAL TREATMENT						
SPECIAL HARDWARE						
FRAME NUMBER						
MOUNTING ASSEMBLY NUMBER						
ROTATE FROM END OPP. CPLG.						
BEARINGS TYPE						
LUBRICATION						
END FLOAT (IF APPL.) INS.						
N.E.M.A. DESIGN LETTER						
AMPS.: F.L./LOCKED ROTOR	/	/	/	/	/	/
LOCKED ROTOR LIMIT, SECS.						
EFFIC. 100%/75%/50% LOAD	/	/	/	/	/	/
% P.F. 100%/75%/50% LOAD	/	/	/	/	/	/
<b>ACCESSORIES:</b>						
BASE						
SPACE HEATERS: WATTS						
VOLTS/PH/Hz	/	/	/	/	/	/
TEMP. DETECTORS: NUMBER						
TYPE						
AIR FILTERS						
MOUNTING COUPLING HALF						
<b>TESTS:</b> (W = WITNESSED)						
N.E.M.A. STD. COMMERCIAL						
TEST CERTIFICATES REQ'D.						
<b>WEIGHTS:</b> (LBS.)						
NET/GROSS	/	/	/	/	/	/
MAX. NORMAL MAINTENANCE						

# REQUISITION



PAGE 10 OF 10

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 1      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942 P

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

SPEC. NUMBER

TITLE

1910-38A6	Low Voltage NEMA Frame TEFC & XP Induction Motors
1910-40A1	Wind, Earthquake and Snow Loading
1910-40A2	Design Loadings for Equipment Structures & Foundations
1910-46A1	Structural Steel
1910-50A21.040	Piping Material Spec. "Lc"
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Systems
1910-83A1	Painting
1910-88C1	Welding Requirements
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

REQUISITION NUMBER

1910-1900A	General Notes for Miscellaneous Equipment
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FORM NO. 135-803

FWEC Contract No. 15-1910  
CONOCO/DOE



# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1942-P

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masonellan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

### Flow

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Venturi, Flow Nozzle, Etc.

B.I.F., Daniel Industries, Vickery-Simms



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.	M-2701	27-1910-1942B		13 Aug. 80	
MATERIAL	M-2702, M-2703, B-2704, B-2705, B-2706, B-2707,			C1	14 Oct. 80	C4	
OR	Vertical Static Tube Aerators and Blowers			C2	6 Feb. 81	C5	
SERVICE				C3		C6	

Procure materials, design, engineer and submit drawings for approval; after approval, fabricate, test and furnish all equipment required for vertical static tube aerators and air blowers to meet the requirements set forth herein.

**I. GENERAL**

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

Mr. Joseph J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468

- E. Aerators will be located in outdoor basins or tanks. Blowers will be located indoors.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and labeled at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-901

BY	J. J. K.	P.O. NO.		SUPPLIER	
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# REQUISITION



PAGE 2 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2 DATE 6 Feb. 81 REQUISITION NO. 27-1910-1942B

### I. GENERAL (cont'd)

G. The system of measurement shall be English.

### H. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 8 of this requisition.
2. Other referenced drawings, specifications, standards, and publications not listed on Page 8 are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

### B. Codes

1. All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER'S drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this Requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

B. The following equipment and services will be provided by others:

1. Electrical power, motor starters, cable.
2. Installation and erection of all equipment and piping.
3. Lighting.
4. Foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
5. Sumps and sewers.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 12

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942B

### III. SCOPE OF WORK (cont'd.)

#### B. (cont'd.)

6. All finish painting.
7. Piping from blowers to aerator laterals.

#### C. The equipment to be supplied by the vendor shall include but not necessarily be limited to the following equipment:

- Vertical static tube aerator assemblies, in-tank or in-basin laterals and piping.
- Required supports, hardware, appurtenances, and anchors.
- Blowers to supply air to the diffusers.

#### D. Scope of Instrumentation

##### 1. The Vendor shall supply the following instrument items, as required.

- A. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
- B. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).
- C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).

##### 2. The following items will be provided by the purchaser:

- A. Electronic controllers.
- B. Indicators.
- C. Alarms.
- D. Programmable controller digital logic.

##### 3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.

##### 4. Vendor shall provide junction box wiring schedules for all instrument wiring. PURCHASER tag numbers shall be used.

##### 5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.

##### 6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

FORM NO. 135-802

# REQUISITION



PAGE 4 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942B

### IV. DESIGN DATA

A. Individual aeration systems shall be designed per the following:

1) Item No. M-2701 - Equalization Aeration System

A complete aeration system shall be furnished to thoroughly mix the entire contents of the equalization basin (A-2707).

Basin Dimensions:

160' long x 80' wide at bottom  
180' long x 100' wide at top  
10' deep (8' water depth)

(Approx. 900,000 gals. capacity)

Air Rate: 500 SCFM to basin  
(Vendor to confirm this number)

Materials of Construction:

Aerators: High density polyethylene  
Laterals: High density polyethylene  
Piping: Carbon steel (0.05" corr. allow.)

2) Item No. M-2702 - Aerobic Digestion Aeration System

A complete aeration system shall be furnished to provide sufficient air to oxidize biomass and to mix the contents of the aerobic digestion tank (TK-2718).

Tank Dimensions:

24' Diameter x 15' deep  
(50,000 gals. capacity)

This system shall be capable of:

- Supplying at least 400 Lb/day of oxygen.
- Thoroughly mixing the tank contents.
- Maintaining a 1-2 mg/l dissolved oxygen level in all portions of the tank

Air Rate: 200 SCFM to tank  
(Vendor to confirm this number)

FORM NO. 136-803



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 12

CHANGE NO. 2

DATE 6 Feb. 81

REQUISITION NO.

27-1910-1942B

## IV. DESIGN DATA (cont'd.)

### A. (cont'd.)

#### 2. Item No. M-2702 (cont'd.)

##### Materials of Construction:

Aerators: High Density Polyethylene  
Laterals: High Density Polyethylene  
Piping: C.S.

Liquid in tank will be secondary sludge from a powdered activated carbon biological oxidation system. Vendor shall suggest acceptable  $\alpha$  and  $\beta$ .

#### 3) Item No. M-2703 - Aeration Basin Aeration System

A complete aeration system shall be furnished to provide sufficient air to allow biological oxidation of influent organic material.

##### Basin dimensions:

83' long x 33' wide at bottom  
135' long x 85' wide at top  
13' deep (11' water depth)

##### This system shall be capable of:

- Supplying at least 100 Lb./Hr of oxygen
- Mixing the entire basin contents (Basin MLSS = 5000 mg/l including up to 2500 mg/l of powdered activated carbon)
- Maintaining a 1-2 mg/l dissolved oxygen level in all portions of the basin.
- For design,  $\alpha = 0.85$ ,  $\beta = 0.95$

Air Rate: 1500 SCFM to basin  
(Vendor to confirm this number)

##### Materials of Construction:

Aerators: High Density Polyethylene  
Laterals: High Density Polyethylene  
Piping: C.S.

FORM NO. 135-802



# REQUISITION



PAGE 6 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942B

### IV. DESIGN DATA (cont'd.)

#### A. (cont'd.)

- 4) Item No. B-2704, B-2705, B-2706, B-2707 - Aeration Blowers see attached data sheets.

#### B. Utilities

##### 1. Electrical Equipment Utilization Voltage

Instruments:                    115v/1phase/60 Hz:  
Motors less than 1/2 HP: 115v/1phase/60 Hz:  
Motors 1/2-200 HP:            460v/3phase/60 Hz:

Area classification: Non-Hazardous

2. Air - plant and instrument air supplied at 100 psig, 100°F

#### C. Site Data

1. Elevation above sea level (ft) 1060 approx.
2. Winter design temperature (°F) - 10.
3. Summer ambient temperature (°F) 92 (Max.)
4. Operating temperature of water in basins & tanks: 40°F to 95°F.

### V. EQUIPMENT DESIGN AND CONSTRUCTION

- A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standard practices.
- B. The aeration system shall be designed such that sections may be isolated and easily removed for maintenance without having to empty the basins. Aerators in TK-2718 shall be fixed, with the tank being drained for maintenance.
- C. Aerator elements shall be designed to provide radial mixing and flow division of the liquid and air.
- D. For aerators installed in basins, each aerator shall be anchored to individual concrete blocks. Each aerator shall include a tethered float to locate aerator and to lift it out for maintenance.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 12

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942B

V. EQUIPMENT DESIGN AND CONSTRUCTION (cont'd.)

- E. Concrete block anchors shall be provided at intermediate points and on slopes to prevent the distribution pipes from lifting during operation, if required. Vendor shall advise details of these supports.
- F. Aerators in TK-2718 shall be anchored to the tank. Vendor shall advise what items are required as part of the tank to support the aerators.
- G. Motors furnished shall be in accordance with Job Spec. 1910-38A6, Low Voltage NEMA Frame TEFC & XP Induction Motors or 1910-38A7, Medium Voltage and Non-NEMA Frame Induction Motors, as applicable.
- H. Piping shall conform to Job Spec. 1910-50A21.040, Piping Material Spec "Lc".
- I. Instruments and Electrical components furnished by the vendor shall comply with Job Spec. 1910-60A1, Instrumentation, and/or 1910-78A4, Electrical Requirements for Packaged Units.

VI. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram showing compressors, piping controls, etc. This diagram shall clearly indicate the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids, and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) Vendor's calculations and design criteria for required air flow. Blower capacity must be matched to required air flow.

FORM NO. 135-902

# REQUISITION



PAGE 8 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942B

### VII. REFERENCED SPECIFICATIONS

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

#### SPEC. NUMBER

#### TITLE

1910-38A6	Low Voltage NEMA Frame TEFC & XP Induction Motors
1910-38A7	Medium Voltage and Non-NEMA Frame Induction Motors
1910-50A21.040	Piping Material Spec. "Lc"
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Units
1910-83A1	Painting
1910-88C1	Welding Requirements
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

#### REQUISITION NUMBER

1910-1900A	General Notes for Miscellaneous Equipment
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FORM NO. 136-903



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 9 OF 12

CLIENT <b>CONOCO / DOE</b>	CONTRACT NO. <b>15-1910</b>	REQUISITION NO. <b>27-1910-1942B</b>	DATE <b>13 AUG 80</b>
SITE <b>NOBLE COUNTY, OHIO</b>	ITEM NO. <b>8-2704</b>		
MATERIAL <b>FAN/BLOWER</b>	NO. REQ'D. <b>ONE</b>	C1 <b>14 Oct 80</b>	C4
SERVICE <b>EQUALIZATION AERATION BLOWER</b>		C2 <b>6 Feb 81</b>	C5
MFR.	MODEL	C3	C6

1 <b>GAS HANDLED</b>	PERFORMANCE
2 Gas <b>AIR</b> Inlet Density <b>Lb/Ft<sup>3</sup></b>	Max. Cap. <b>ACFM</b> Turndown Ratio
3 Composition	Oper. Speed <b>First Critical</b> <b>RPM</b>
4 Wt %	Fan Eff. <b>%</b> Fan WR <sup>2</sup> <b>Lbs-Ft<sup>2</sup></b>
5 Inlet Temp. (NOTE 1) <b>°F</b> Inlet Press. <b>In W.C.</b>	BHP @ Shaft <b>Drive Eff.</b> <b>%</b>
6 <input type="checkbox"/> Corrosive <input type="checkbox"/> Toxic <input type="checkbox"/>	<b>DRIVE</b>
7 <b>OPERATING CONDITIONS</b>	<input type="checkbox"/> Constant Speed <input type="checkbox"/> Variable Speed
8 Capacity <b>(DRY)</b> <b>550</b> <b>ACFM</b>	<input type="checkbox"/> Gear Reducer: Mfr. <b>Model</b>
9 DISCHARGE PRESS. <b>23.21</b> <b>PSIA</b>	Rated HP <b>AGMA</b> <b>SF</b>
10 Barometric Pressure <b>(SUCTION PRESS.)</b> <b>14.21</b> <b>PSIA</b>	RPM In/Out <b>/</b> Lubrication
11 Dust Loading <b>Grains/ACF</b>	<input type="checkbox"/> Couplings Type <b>Mfr</b>
12 <input type="checkbox"/> Abrasive <input type="checkbox"/> Sticky <input type="checkbox"/>	<input type="checkbox"/> Belt <input type="checkbox"/> Direct <b>RPM</b> In/Out <b>/</b>
13 Duty <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intmt <b>Hrs/Day</b>	<input type="checkbox"/> Drive Guards (Removable Rigid Steel)
14 <b>CONSTRUCTION DETAILS</b>	Motor By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others
15 Type <input type="checkbox"/> Centrifugal <input type="checkbox"/> Axial <input checked="" type="checkbox"/> <b>ROTARY</b>	<b>HP</b> <b>SF</b> <b>1.15</b> <b>RPM</b> <b>Frame</b>
16 Arrangement <input type="checkbox"/> SWSI <input type="checkbox"/> DWDI	<b>V,</b> <b>PH,</b> <b>HZ</b> Encl. <b>TEFL</b>
17 AMCA Arrg't. No. <b>Class No.</b>	Type <b>Mfr.</b>
18 Disch. <input type="checkbox"/> Top Horiz <input type="checkbox"/> Upblast <input type="checkbox"/>	Insul. Cl. <b>BerF</b> Brg's <b>Lube</b>
19 Rot'n. Viewed From Drive End <input type="checkbox"/> CW <input type="checkbox"/> CCW	Rise <b>°C</b> FL Amps <b>LR Amps</b>
20 Impeller <input type="checkbox"/> Airfoil <input type="checkbox"/> Radial Tip <input type="checkbox"/>	<b>AUXILIARIES</b>
21 Dia. <b>Width</b> <b>No. of Blades</b>	<input type="checkbox"/> Inlet Screen <input checked="" type="checkbox"/> Inlet Filter
22 Blade Mat'l. <b>Thk.</b>	<input type="checkbox"/> Inlet <input type="checkbox"/> Outlet <input type="checkbox"/> Guide Vanes <input type="checkbox"/> Damper
23 <input type="checkbox"/> Blade Liner Mat'l. <b>Thk.</b>	<input type="checkbox"/> Auto Operator For Capacity Control
24 Housing <input type="checkbox"/> Split for Wheel Removal	Type <b>Mfr.</b>
25 Scroll Mat'l. <b>Thk.</b>	<input checked="" type="checkbox"/> Silencers <input checked="" type="checkbox"/> Inlet <input checked="" type="checkbox"/> Outlet
26 Side Plate Mat'l. <b>Thk.</b>	Type <b>Mfr.</b>
27 <input type="checkbox"/> Liners <input type="checkbox"/> Side Pl. <input type="checkbox"/> Scroll	<input type="checkbox"/>
28 Mat'l. <b>Thk.</b>	
29 Gas Inlet Size <input type="checkbox"/> Flanged	<b>SHOP TESTS</b> <b>REQ'D</b> <b>WITNESSED</b>
30 Gas Outlet Size <input type="checkbox"/> Flanged	Static/Dynamic Bal. <input type="checkbox"/>
31 <input type="checkbox"/> Access Door Size <b>No.</b>	Mech. Run Drive <input checked="" type="checkbox"/>
32 <input type="checkbox"/> Drain Conn. Size <b>Plugged</b>	Performance <input checked="" type="checkbox"/>
33 <input type="checkbox"/> Inlet Box(es) Mat'l. <b>Thk.</b>	<b>SITE DATA</b>
34 <input type="checkbox"/> Liner Mat'l. <b>Thk.</b>	Ambient <b>92</b> <b>°F</b> Max. <b>To -10</b> <b>°F</b> Min.
35 Shaft Dia. <b>Mat'l.</b>	installed <input checked="" type="checkbox"/> Indoors <input type="checkbox"/> Outdoors
36 Casing Seal Type & Mat'l.	Cl <b>Gr</b> <b>Div</b> <input checked="" type="checkbox"/> Non-Hazardous
37 <input type="checkbox"/> Purge With <b>Conn. Size</b>	Altitude @ Gr. Above Sea Level <b>1060</b> <b>Ft</b>
38 <input type="checkbox"/> Shaft Heat Slinger	<b>UTILITIES AVAILABLE</b>
39 Bearings <b>B-10</b> <b>Life</b> <b>Hrs.</b>	Air @ <b>100</b> <b>PSIG</b> <b>100</b> <b>°F</b>
40 <input type="checkbox"/> Anti-Friction Type <input type="checkbox"/> Sleeve	Electricity <b>115 / 460</b> <b>V.</b> <b>1 / 3</b> <b>PH,</b> <b>60</b> <b>HZ</b>
41 Lube <input type="checkbox"/> Grease <input type="checkbox"/> Forced Recirc. Oil	Water @ <b>PSIG</b> and <b>°F</b>
42 Press.: Oper. <b>Shutdown</b> <b>PSIG</b>	<b>APPLICABLE DOCUMENTS</b>
43 Temp.: Oper. <b>Shutdown</b> <b>°F</b>	
44 <input type="checkbox"/> Cooling Water Req't. <b>GPM/Brg</b>	
45 Weight of Rotor Assembly <b>Lbs.</b>	
46 Total Weight <b>Lbs.</b>	
47	<b>NOTES</b> 1. AMBIENT TEMPERATURE VARIES FROM -10°F (MIN.) TO 92°F (MAX). FOR BLOWER DESIGN USE 92°F, 100% HUMIDITY. 2. MAX. ALLOWABLE DISCHARGE TEMPERATURE: 250°F.
48	
49	
50	
51	

FORM NO. 135-363

BY \_\_\_\_\_ P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 10 OF 12

CLIENT <b>CONOCO/DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO. <b>27-1910-1942F</b>		DATE <b>13 AUG 80</b>	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO. <b>B-2705</b>		C1 <b>14 Oct 80</b>		C4	
MATERIAL <b>FAN/BLOWER</b>		NO. REQ'D. <b>ONE</b>		C2 <b>6 Feb 81</b>		C5	
SERVICE <b>AEROBIC DIGESTION AERATION BLOWER</b>		MFR.		C3		C6	
MODEL							
1 GAS HANDLED				PERFORMANCE			
2 Gas <b>AIR</b>		Inlet Density		Lb/Ft <sup>3</sup>		Max. Cap. ACFM	
3 Composition				Oper. Speed		First Critical RPM	
4 Wt %				Fan Eff.		% Fan WR <sup>2</sup> Lbs-Ft <sup>2</sup>	
5 Inlet Temp. (NOTE) °F		Inlet Press.		In W.C.		BHP @ Shaft Drive Eff. %	
6 <input type="checkbox"/> Corrosive		<input type="checkbox"/> Toxic		<input type="checkbox"/>		DRIVE	
7 OPERATING CONDITIONS				<input type="checkbox"/> Constant Speed <input type="checkbox"/> Variable Speed			
8 Capacity (DRY)		<b>225</b>		ACFM		<input type="checkbox"/> Gear Reducer: Mfr. Model	
9 DISCHARGE PRESSURE		<b>23.21</b>		PSIA		Rated HP AGMA SF	
10 Barometric Pressure & SUCTION PRESS.		<b>14.21</b>		PSIA		RPM In/Out / Lubrication	
11 Dust Loading		Grains/ACF		<input type="checkbox"/> Couplings Type		Mfr	
12 <input type="checkbox"/> Abrasive		<input type="checkbox"/> Sticky		<input type="checkbox"/>		<input type="checkbox"/> Belt <input type="checkbox"/> Direct RPM In/Out /	
13 Duty <input checked="" type="checkbox"/> Continuous		<input type="checkbox"/> Intmt		<input type="checkbox"/>		Hrs/Day <input type="checkbox"/> Drive Guards (Removable Rigid Steel)	
14 CONSTRUCTION DETAILS				Motor By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others			
15 Type <input type="checkbox"/> Centrifugal		<input type="checkbox"/> Axial		<input checked="" type="checkbox"/> ROTARY		HP SF 1.15 RPM Frame	
16 Arrangement <input type="checkbox"/> SWSI		<input type="checkbox"/> DWDI		V, PH, HZ Encl. <b>TEFC</b>			
17 AMCA Arrgt. No.		Class No.		Type		Mfr.	
18 Disch. <input type="checkbox"/> Top Horiz		<input type="checkbox"/> Upblast		<input type="checkbox"/>		Insul. Cl. <b>Brk F</b> Brg's Lube	
19 Rot'n. Viewed From Drive End		<input type="checkbox"/> CW		<input type="checkbox"/> CCW		Rise °C FL Amps LR Amps	
20 Impeller <input type="checkbox"/> Airfoil		<input type="checkbox"/> Radial Tip		<input type="checkbox"/>		AUXILIARIES	
21 Dia. Width		No. of Blades		<input type="checkbox"/> Inlet Screen		<input checked="" type="checkbox"/> Inlet Filter	
22 Blade Mat'l.		Thk.		<input type="checkbox"/> Inlet <input type="checkbox"/> Outlet		<input type="checkbox"/> Guide Vanes <input type="checkbox"/> Damper	
23 <input type="checkbox"/> Blade Liner Mat'l.		Thk.		<input type="checkbox"/> Auto Operator For Capacity Control			
24 Housing <input type="checkbox"/> Split for Wheel Removal				Type		Mfr.	
25 Scroll Mat'l.		Thk.		<input checked="" type="checkbox"/> Silencers		<input checked="" type="checkbox"/> Inlet <input checked="" type="checkbox"/> Outlet	
26 Side Plate Mat'l.		Thk.		Type		Mfr.	
27 <input type="checkbox"/> Liners		<input type="checkbox"/> Side Pl. <input type="checkbox"/> Scroll		<input type="checkbox"/>			
28 Mat'l.		Thk.		SHOP TESTS			
29 Gas Inlet Size		<input type="checkbox"/> Flanged		Static/Dynamic Bal.		REQ'D WITNESSED	
30 Gas Outlet Size		<input type="checkbox"/> Flanged		Mech. Run Drive		<input type="checkbox"/>	
31 <input type="checkbox"/> Access Door Size		No.		Performance		<input type="checkbox"/>	
32 <input type="checkbox"/> Drain Conn. Size		Plugged				<input type="checkbox"/>	
33 <input type="checkbox"/> Inlet Box(es) Mat'l.		Thk.		SITE DATA			
34 <input type="checkbox"/> Liner Mat'l.		Thk.		Ambient <b>92</b> °F Max. To <b>-10</b> °F Min.			
35 Shaft Dia. Mat'l.				Installed <input checked="" type="checkbox"/> Indoors <input type="checkbox"/> Outdoors			
36 Casing Seal Type & Mat'l.				Cl Gr Div <input checked="" type="checkbox"/> Non-Hazardous			
37 <input type="checkbox"/> Purge With		Conn. Size		Altitude @ Gr. Above Sea Level <b>1060</b> Ft			
38 <input type="checkbox"/> Shaft Heat Slinger				UTILITIES AVAILABLE			
39 Bearings		8-10 Life		Hrs. Air @ <b>100</b> PSIG		<b>100</b> °F	
40 <input type="checkbox"/> Anti-Friction Type		<input type="checkbox"/> Sleeve		Electricity <b>115/460V, 1/3 PH, 60 HZ</b>			
41 Lube <input type="checkbox"/> Grease		<input type="checkbox"/> Forced Recirc. Oil		Water @ PSIG and °F			
42 Press.: Oper. Shutdown		PSIG		APPLICABLE DOCUMENTS			
43 Temp.: Oper. Shutdown		°F					
44 <input type="checkbox"/> Cooling Water Req't.		GPM/Brg					
45 Weight of Rotor Assembly		Lbs.					
46 Total Weight		Lbs.					
47				1. AMBIENT TEMPERATURE VARIES FROM -10°F (MIN.) TO 92°F (MAX.). FOR BLOWER DESIGN USE 92°F, 100% HUMIDITY			
48				2. MAX. ALLOWABLE DISCHARGE TEMPERATURE: 250°F			
49							
50							
51							
BY		P. O. NO.		VENDOR			

FORM NO. 135-363



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 11 OF 12

CLIENT <b>CONOCO / DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO.		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO. <b>B-2706</b>		<b>27-1910-1942 B</b>		<b>13 Aug 80</b>	
MATERIAL <b>FAN/BLOWER</b>		NO. REQ'D. <b>ONE</b>		C1	<b>14 Oct 80</b>	C4	
SERVICE <b>AERATION BASIN BLOWER</b>				C2	<b>6 Feb 81</b>	C5	
MFR.		MODEL		C3		C6	
<b>1 GAS HANDLED</b>				<b>PERFORMANCE</b>			
2 Gas <b>AIR</b>		Inlet Density <b>Lb/Ft<sup>3</sup></b>		Max. Cap.		ACFM Turndown Ratio	
3 Composition				Oper. Speed		First Critical <b>RPM</b>	
4 Wt %				Fan Eff.		% Fan WR <sup>2</sup> <b>Lbs-Ft<sup>2</sup></b>	
5 Inlet Temp. (NOTE) <sup>OF</sup>		Inlet Press.		In W.C.		BHP @ Shaft <b>Drive Eff.</b> %	
6 <input type="checkbox"/> Corrosive		<input type="checkbox"/> Toxic		<b>DRIVE</b>			
<b>OPERATING CONDITIONS</b>				<input type="checkbox"/> Constant Speed <input type="checkbox"/> Variable Speed			
8 Capacity (DRY) <b>1650</b>		ACFM		<input type="checkbox"/> Gear Reducer: Mfr.		Model	
9 DISCHARGE PRESSURE <b>23.21</b>		PSIA		Rated HP		AGMA SF	
10 Barometric Pressure		SUCTION PRESS. <b>14.21</b>		RPM In/Out /		Lubrication	
11 Dust Loading		Grains/ACF		<input type="checkbox"/> Couplings Type		Mfr	
12 <input type="checkbox"/> Abrasive		<input type="checkbox"/> Sticky		<input type="checkbox"/> Belt		<input type="checkbox"/> Direct RPM In/Out /	
13 Duty <input checked="" type="checkbox"/> Continuous		<input type="checkbox"/> Intmt		<input type="checkbox"/> Drive Guards (Removable Rigid Steel)			
<b>CONSTRUCTION DETAILS</b>				Motor By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others			
15 Type <input type="checkbox"/> Centrifugal		<input type="checkbox"/> Axial		<input checked="" type="checkbox"/> ROTARY		HP <b>SF 1.15</b> RPM <b>Frame</b>	
16 Arrangement <input type="checkbox"/> SWSI		<input type="checkbox"/> OWDI		V, PH, HZ Encl. <b>TEFC</b>			
17 AMCA Arrg't. No.		Class No.		Type		Mfr.	
18 Disch. <input type="checkbox"/> Top Horiz		<input type="checkbox"/> Upblast		Insul. Cl. <b>Box F</b>		Brg's <b>Lube</b>	
19 Rot'n. Viewed From Drive End		<input type="checkbox"/> CW <input type="checkbox"/> CCW		Rise <sup>OC</sup>		FL Amps <b>LR Amps</b>	
20 Impeller <input type="checkbox"/> Airfoil		<input type="checkbox"/> Radial Tip		<b>AUXILIARIES</b>			
21 Dia. <b>Width</b>		No. of Blades		<input type="checkbox"/> Inlet Screen		<input checked="" type="checkbox"/> Inlet Filter	
22 Blade Mat'l.		Thk.		<input type="checkbox"/> Inlet <input type="checkbox"/> Outlet		<input type="checkbox"/> Guide Vanes <input type="checkbox"/> Damper	
23 <input type="checkbox"/> Blade Liner Mat'l.		Thk.		<input type="checkbox"/> Auto Operator For Capacity Control			
24 Housing <input type="checkbox"/> Split for Wheel Removal				Type		Mfr.	
25 Scroll Mat'l.		Thk.		<input checked="" type="checkbox"/> Silencers		<input checked="" type="checkbox"/> Inlet <input checked="" type="checkbox"/> Outlet	
26 Side Plate Mat'l.		Thk.		Type		Mfr.	
27 <input type="checkbox"/> Liners		<input type="checkbox"/> Side Pl. <input type="checkbox"/> Scroll		<input type="checkbox"/>			
28 Mat'l.		Thk.					
29 Gas Inlet Size		<input type="checkbox"/> Flanged		<b>SHOP TESTS</b>		<b>REQ'D</b>	
30 Gas Outlet Size		<input type="checkbox"/> Flanged		Static/Dynamic Bal.		<input type="checkbox"/>	
31 <input type="checkbox"/> Access Door Size		No.		Mech. Run Drive		<input checked="" type="checkbox"/>	
32 <input type="checkbox"/> Drain Conn. Size		Plugged		Performance		<input type="checkbox"/>	
33 <input type="checkbox"/> Inlet Box(es) Mat'l.		Thk.		<b>SITE DATA</b>			
34 <input type="checkbox"/> Liner Mat'l.		Thk.		Ambient <b>92</b> <sup>OF</sup> Max. To <b>-10</b> <sup>OF</sup> Min.			
35 Shaft Dia. <b>Mat'l.</b>				Installed <input checked="" type="checkbox"/> Indoors <input type="checkbox"/> Outdoors			
36 Casing Seal Type & Mat'l.				CI Gr Div <input checked="" type="checkbox"/> Non-Hazardous			
37 <input type="checkbox"/> Purge With		Conn. Size		Altitude @ Gr. Above Sea Level <b>1060</b> Ft			
38 <input type="checkbox"/> Shaft Heat Slinger				<b>UTILITIES AVAILABLE</b>			
39 Bearings <b>B-10</b> Life		Hrs.		Air @ <b>100</b> PSIG		<b>100</b> <sup>OF</sup>	
40 <input type="checkbox"/> Anti-Friction Type		<input type="checkbox"/> Sleeve		Electricity <b>115/460</b> V, <b>1/3</b> PH, <b>60</b> HZ			
41 Lube <input type="checkbox"/> Grease		<input type="checkbox"/> Forced Recirc. Oil		Water @ <b>PSIG</b> and <b>OF</b>			
42 Press.: Oper. <b>Shutdown</b>		PSIG		<b>APPLICABLE DOCUMENTS</b>			
43 Temp.: Oper. <b>Shutdown</b>		<sup>OF</sup>					
44 <input type="checkbox"/> Cooling Water Req't.		GPM/Brg					
45 Weight of Rotor Assembly		Lbs.					
46 Total Weight		Lbs.					
47		1. AMBIENT TEMPERATURE VARIES FROM -10°F (MIN.) TO					
48		92°F (MAX). FOR BLOWER DESIGN USE 92°F, 100% HUMIDITY					
49		2. MAX. ALLOWABLE DISCHARGE TEMPERATURE: 250°F					
50							
51							
BY		P. O. NO.		VENDOR			

FORM NO. 135-363



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 12 OF 12

CLIENT <b>CONOCO / DOE</b>	CONTRACT NO. <b>15-1910</b>	REQUISITION NO.	DATE
SITE <b>NORLE COUNTY, OHIO</b>	ITEM NO. <b>B-2707</b>	<b>27-1910-1942B</b>	<b>13 AUG 80</b>
MATERIAL <b>FAN/BLOWER</b>	NO. REQ'D. <b>ONE</b>	C1 <b>14 Oct 80</b>	C4
SERVICE <b>COMMON SPARE FOR B-2704/5/6</b>		C2 <b>6 Feb 81</b>	C5
MFR.	MODEL	C3	C6

1 GAS HANDLED				PERFORMANCE			
2 Gas <b>AIR</b>	Inlet Density		Lb/Ft <sup>3</sup>	Max. Cap.	ACFM Turndown Ratio		
3 Composition				Oper. Speed	First Critical RPM		
4 Wt %				Fan Eff.	% Fan WR <sup>2</sup>	Lbs-Ft <sup>2</sup>	
5 Inlet Temp. (NOTE) <sup>OF</sup>	Inlet Press.		In W.C.	BHP @ Shaft	Drive Eff. %		
6 <input type="checkbox"/> Corrosive	<input type="checkbox"/> Toxic		<input type="checkbox"/>	DRIVE			
7 OPERATING CONDITIONS				<input type="checkbox"/> Constant Speed <input type="checkbox"/> Variable Speed			
8 Capacity	(NOTE 3) ACFM		<input type="checkbox"/> Gear Reducer: Mfr. Model				
9 DISCHARGE PRESSURE	<b>23.21 PSIA</b>			Rated HP	AGMA SF		
10 Barometric Pressure & SUCT. PRESS.	<b>14.21 PSIA</b>			RPM In/Out	/ Lubrication		
11 Dust Loading	Grains/ACF			<input type="checkbox"/> Couplings Type Mfr			
12 <input type="checkbox"/> Abrasive	<input type="checkbox"/> Sticky		<input type="checkbox"/>	<input type="checkbox"/> Belt	<input type="checkbox"/> Direct	RPM In/Out /	
13 Duty	<input type="checkbox"/> Continuous		<input checked="" type="checkbox"/> Intmt	<input type="checkbox"/> Drive Guards (Removable Rigid Steel)			
14 CONSTRUCTION DETAILS				Motor By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others			
15 Type	<input type="checkbox"/> Centrifugal		<input type="checkbox"/> Axial	<input checked="" type="checkbox"/> ROTARY			
16 Arrangement	<input type="checkbox"/> SWSI		<input type="checkbox"/> DWDI	V, PH, HZ	Encl. <b>TEFC</b>		
17 AMCA Arr'g't. No.	Class No.		Type	Mfr.			
18 Disch.	<input type="checkbox"/> Top Horiz		<input type="checkbox"/> Upblast	<input type="checkbox"/>	Insul. Cl. <b>Box F</b>		Brq's Lube
19 Rot'n. Viewed From Drive End	<input type="checkbox"/> CW		<input type="checkbox"/> CCW	Rise <sup>OC</sup>	FL Amps		LR Amps
20 Impeller	<input type="checkbox"/> Airfoil		<input type="checkbox"/> Radial Tip	<input type="checkbox"/>			
				AUXILIARIES			
21 Dia.	Width		No. of Blades	<input type="checkbox"/> Inlet Screen <input checked="" type="checkbox"/> Inlet Filter			
22 Blade Mat'l.	Thk.		<input type="checkbox"/> Inlet <input type="checkbox"/> Outlet <input type="checkbox"/> Guide Vanes <input type="checkbox"/> Damper				
23 <input type="checkbox"/> Blade Liner Mat'l.	Thk.		<input type="checkbox"/> Auto Operator For Capacity Control				
24 Housing	<input type="checkbox"/> Split for Wheel Removal			Type	Mfr.		
25 Scroll Mat'l.	Thk.		<input checked="" type="checkbox"/> Silencers <input checked="" type="checkbox"/> Inlet <input checked="" type="checkbox"/> Outlet				
26 Side Plate Mat'l.	Thk.		Type	Mfr.			
27 <input type="checkbox"/> Liners	<input type="checkbox"/> Side Pl.		<input type="checkbox"/> Scroll	<input type="checkbox"/>			
28 Mat'l.	Thk.						
29 Gas Inlet Size	<input type="checkbox"/> Flanged		SHOP TESTS				
30 Gas Outlet Size	<input type="checkbox"/> Flanged		Static/Dynamic Bal.		REQ'D		WITNESSED
31 <input type="checkbox"/> Access Door Size	No.		Mech. Run Drive		<input checked="" type="checkbox"/>		<input type="checkbox"/>
32 <input type="checkbox"/> Drain Conn. Size	Plugged		Performance		<input checked="" type="checkbox"/>		<input type="checkbox"/>
33 <input type="checkbox"/> Inlet Box(es) Mat'l.	Thk.		SITE DATA				
34 <input type="checkbox"/> Liner Mat'l.	Thk.		Ambient		<b>92 °F Max. To -10 °F Min.</b>		
35 Shaft Dia.	Mat'l.		Installed		<input checked="" type="checkbox"/> Indoors <input type="checkbox"/> Outdoors		
36 Casing Seal Type & Mat'l.			Cl Gr Div		<input checked="" type="checkbox"/> Non-Hazardous		
37 <input type="checkbox"/> Purge With	Conn. Size		Altitude @ Gr. Above Sea Level		<b>1060 Ft</b>		
38 <input type="checkbox"/> Shaft Heat Slinger	UTILITIES AVAILABLE						
39 Bearings	8-10 Life		Hrs.	Air @	<b>100 PSIG</b>		<b>100 °F</b>
40 <input type="checkbox"/> Anti-Friction Type	<input type="checkbox"/> Sleeve		Electricity		<b>115/460 V. 1/3 PH. 60 HZ</b>		
41 Lube <input type="checkbox"/> Grease	<input type="checkbox"/> Forced Reclrc. Oil		Water @		PSIG and °F		
42 Press.: Oper.	Shutdown		PSIG		APPLICABLE DOCUMENTS		
43 Temp.: Oper.	Shutdown		°F				
44 <input type="checkbox"/> Cooling Water Req't.	GPM/Brg						
45 Weight of Rotor Assembly	Lbs.						
46 Total Weight	Lbs.						

FORM NO. 135-363

NOTES

1. AMBIENT TEMPERATURE VARIES FROM -10°F (MIN.) TO 92°F (MAX.). FOR BLOWER DESIGN USE 92°F, 100% HUMIDITY  
 2. MAX. ALLOWABLE DISCHARGE TEMPERATURE: 250°F  
 3. CAPACITY SHALL BE SUCH TO MEET THE REQUIREMENTS OF B-2704/B-2705/B-2706.

BY \_\_\_\_\_ P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_



# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1942B

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

### Flow

#### Differential Pressure Transmitter

Barton, Rosemount, Foxboro

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Flow Switches

Barton, Magnetrol, Peeco

#### Flow Glasses

Brooks, Fischer & Porter, Jergusen

### Pressure

#### Transmitters

Foxboro, Taylor, Rosemount

#### Local Controllers

Fisher Controls, Foxboro, Taylor





## FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

### Relief Valves

Consolidated, Crosby Valve & Gauge, Farris Engineering

### Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

### Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge

### Temperature

#### Thermo Couples and Wells

Temtex, Tempo, Thermo Electric

#### Dial Thermometers

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Palmer Instruments



**REQUISITION**  
**FOSTER WHEELER ENERGY CORPORATION**

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	M-2704	27-1910-1942-E	Jul 17, 1980
MATERIAL	In-Line Static Polymer Mixer			C1	6 Feb. 81
OR				C2	C5
SERVICE				C3	C6

Design, fabricate, and furnish all equipment required for one (1) in-line static mixer to meet the requirements set forth herein.

**I. GENERAL**

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:
 

Mr. J. J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468
- E. All equipment covered by this requisition will be located indoors.
- F. Equipment shall receive the following test before shipment:
 

Hydrostatic test of assembled units
- G. The system of measurement shall be English.
- H. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Material shall be prepared for shipment in accordance with Job Specification 1910-97A1.

BY J KUNYZ	P.O. NO.	SUPPLIER
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FORM NO. 135-901

# REQUISITION



PAGE 2 OF 3

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 1	DATE 6 Feb. 1981	REQUISITION NO. 27-1910-1942-E
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### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements. These specifications are:

- 1) 1910-50A2 - Gaskets & Surface Finish for Bolted Flanged Joints
- 2) 1910-97A1 - Preparation of Material for Shipment
- 3) 1910-1900A - General Notes for Miscellaneous Equipment

#### B. Codes

All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

- A. The vendor shall quote on the base equipment outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base equipment and clearly identify these advantages in his proposal.
- B. The equipment shall mix dilute polymer solution with a wastewater stream for further processing.

### IV. PROCESS DATA

#### A. Diluted Polymer

1. Addition Rate ..... 2 mg/l of wastewater
2. Viscosity .....
3. Temperature ..... 70°F
4. Pressure ..... 100 psig (Max.)
5. Type of Polymer..... \*\*

FORM NO. 156-008



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	1	DATE	6 Feb. 1981	REQUISITION NO.	27-1910-1942-E
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### IV. PROCESS DATA (cont'd.)

#### B. Waste water Stream

1. Flow ..... 152 gpm (normal) 225 gpm (Des.)
2. Temperature ..... 100<sup>o</sup>F (max.)
3. Pressure ..... 30 psig

C. Maximum  $\Delta$ P across Mixer ..... 10 psi \*

#### D. Site Data

1. Elevation above sea level (ft) 1050 (approx.)
2. Winter design temperature (<sup>o</sup>F) -10
3. Summer ambient temperature (<sup>o</sup>F) 92 (max.)

### V. MECHANICAL SPECIFICATIONS

A. Design Pressure ..... 300 psig (Min.)

B. Design Temperature ..... 100 <sup>o</sup>F

#### C. Materials of Construction:

C.S. Housing, 316L stainless steel internals

D. Corrosion Allowance ..... 1/16" in.

E. Nominal Pipe Size/Schedule ..... 4" in /Sch. 40

F. Flange Rating (ANSI) ..... 150# R.F.

G. Length (Flange-face-to-face) ..... \*

H. Vendor to advise/confirm whether internal element is removal for shutdown and cleaning purposes.

\* Vendor to advise/confirm

\*\* Purchaser to advise/confirm

FORM NO. 135-802



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 7

CLIENT <u>Conoco/DOE</u>	CONTRACT NO. <u>15-1910</u>	REQUISITION NO.	DATE
SITE <u>Noble County, Ohio</u>	ITEM NO. <u>S-2701</u>	<u>27-1910-1942F</u>	<u>5 Aug 80</u>
MATERIAL <u>API Separator</u>		C1 16 Sep.80	C4
OR		C2 6 Feb 81	C5
SERVICE		C3	C6

Design, fabricate and furnish all equipment required for an API Separator to meet the requirements set forth herein.

### I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

Mr. Joseph Kunyz  
 Foster Wheeler Energy Corporation  
 110 South Orange Avenue  
 Livingston, New Jersey 07039

Telephone: (201) 533-2468

- E. All equipment covered by this requisition will be located outdoors, in ground.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and labeled at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-601

BY <u>JJK</u>	P.O. NO.	SUPPLIER
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# REQUISITION

PAGE 2 OF 7

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942F
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### I. GENERAL (cont'd.)

- G. Equipment shall receive the manufacturer's standard tests before shipment.
- H. The system of measurement shall be English.
- J. Schedule of Materials Shipment:

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with Job Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS, AND STANDARDS

- A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

- 1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 7 of this requisition.

- 2. Codes

All equipment and/or material shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

- A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 7

CHANGE NO. 2      DATE 6 Feb 81      REQUISITION NO. 27-1910-1942-F

**IID. SCOPE OF WORK (cont'd)**

**B. The following equipment and services will be provided by others:**

1. Electrical power, motor starters, cable
2. Installation and erection of all equipment and piping
3. Lighting
4. Foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply
5. Interconnecting piping between individual equipment skids
6. Interconnections, pneumatic and electrical, between the equipment skids
7. Sumps, sewers, and concrete basins

**C. The following equipment and services shall be provided by the vendor:**

1. Separator designed to conform (as a minimum) to American Petroleum Institute, Manual on Disposal of Refinery Wastes, 1969.
2. Two parallel 100% bays are to be provided. Isolation valves are to be provided on entrance to each forebay.
3. A slotted pipe shall be provided for oil removal.
4. A perforated pipe in the sludge through shall be provided for periodic sludge removal.

**D. Scope of Instrumentation**

1. The Vendor shall supply the following instrument items if required:
  - a. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - b. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).
  - c. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).

FORM NO. 135-802



# REQUISITION

PAGE 4 OF 7

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942F
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### III. SCOPE OF WORK (cont'd.)

#### D. (cont'd.)

2. The following items will be provided by the Purchaser:
  - a. Electronic controllers
  - b. Indicators
  - c. Alarms
  - d. Programmable controller digital logic
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.

### IV. DESIGN DATA

The system is to remove free oil (oil droplets greater than 150 microns) from a coal gasification oily water sewer system. The system shall meet and fulfill the following data requirements.

A. <u>Influent</u>	<u>Average</u>	<u>Design</u>
Flow, GPM	30	100 (each bay)
TSS, mg/l	500	1500
Oil, mg/l	2000	4000

Influent Temperature, °F  
 Avg.: 50 Summer: 72 (92 Max.) Winter: 35  
 Water specific gravity  
 Avg.: 0.9997 Summer: 0.998 Winter: 1.0  
 Oil specific gravity  
 Avg.: 0.92 Summer 0.918 Winter 0.93  
 Absolute viscosity of water, in poises  
 Avg.: 0.0131 Summer 0.0098 Winter 0.0175

#### B. Effluent

All oil droplets greater than 150 microns are to be removed.





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 7

CHANGE NO. 2      DATE 6 Feb 81      REQUISITION NO. 27-1910-1942 -F

### IV. DESIGN DATA (cont'd.)

#### C. Utilities

##### 1. Electrical Equipment Utilization Voltage

Instruments: 115v/1Phase/60Hz  
Motors less than 1/2 HP:115v/1 Phase/60 Hz  
Motors 1/2-200 HP:460v/3 Phase/60 Hz

Area classification: Non-Hazardous (Unclassified)

##### 2. Air - Plant and instrument air at 100 psig, 100°F.

#### D. Site Data

1. Elevation above sea level (ft)      1050 (approx.)

2. Winter design temperature (°F)      -10

3. Summer ambient temperature (°F)      92 (Max.)

### V. EQUIPMENT DESIGN AND CONSTRUCTION

A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA, and other governing codes or standard practice.

B. Separator shall be suitable for inground installation. Basic design of the separator shall be as per American Petroleum Institute, Manual on Disposal of Refinery Wastes, Volume on Liquid Wastes, Chapter 5, 1969.

C. The separator shall be concrete construction. The vendor shall furnish detailed design of the concrete work (for construction by purchaser) and shall furnish all internal equipment.

D. Equipment for skimming oil and removing sludge shall be provided.

E. Motors shall be in accordance with Job Specification 1910-38A6, Low Voltage NEMA Frame TEFC, and XP Induction Motors.

#### F. Instruments

All instruments shall be in accordance with Job Specification 1910-60A1. See paragraph III.D. for scope of instrumentation.

#### G. Electrical

Electrical components furnished by the vendor shall be in accordance with Job Specification 1910-78A4, Electrical Requirements of Packaged Units.

FORM NO. 135-902



# REQUISITION

PAGE 6 OF 7

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942F
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### VI. GUARANTEE

- A. The vendor shall guarantee that the API separator when installed and operated in accordance with his instructions, will be capable of treating the quoted quantities of wastes at the specified rates.
- B. For mechanical guarantee, see commercial papers.

### VII. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram clearly, indicating the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) The following equipment data shall be completed and returned with the vendor's proposal.

#### 1. Separator

Number of channels \_\_\_\_\_  
 Width, per channel, Ft. \_\_\_\_\_  
 Total width, Ft. \_\_\_\_\_  
 Depth, Ft. \_\_\_\_\_  
 Length, Ft. \_\_\_\_\_

FORM NO. 135-903

# REQUISITION



PAGE 7 OF 7

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 6 Feb 81      REQUISITION NO. 27-1910-1942F

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

<u>SPEC. NUMBER</u>	<u>TITLE</u>
1910-38A6	Low Voltage NEMA Frame TEFC & XP Induction Motors
1910-40A1	Wind, Earthquake and Snow Loading
1910-40A2	Design Loadings for Equipment Structures & Foundations
1910-46A1	Structural Steel
1910-50A22.010	Piping Material Spec. "M"
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements of Packaged Units
1910-83A1	Painting
1910-88C1	Welding Requirements
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

REQUISITION NUMBER

1910-1900A      General Notes for Miscellaneous Equipment

FORM NO. 135-803



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 12

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.	S-2702A/B	27-1910-1942-G		14 Jul 80	
MATERIAL	Dissolved Air Flotation (DAF) System			C1	4 Sep 80	C4	
OR				C2	6 Feb 81	C5	
SERVICE				C3		C6	

Design, fabricate and furnish all equipment required for a dissolved air flotation system to meet the requirements set forth herein.

### I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:
 

Mr. J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468
- E. All equipment covered by this requisition will be located outdoors.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and identified at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-901

BY	J. J. K.	P.O. NO.	SUPPLIER
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# REQUISITION



PAGE 2 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942G
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### I. GENERAL (cont'd)

G. Equipment shall receive the following tests before shipment:

1. Certified hydrostatic test of individual vessels.
2. Hydrostatic test of assembled skids.
3. Functional electrical test.

H. The system of measurement shall be English.

J. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards and drawings. These form an integral part of the work requirements.

1. Specification and drawings, etc., which are furnished by the PURCHASER are listed on Page 12 of this requisition.
2. Other referenced drawings, specifications, standards and publications not listed on Page 12 are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

B. Codes

1. All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes etc., shall immediately be brought to the attention of the PURCHASER.



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 12

CHANGE NO. 2      DATE 6 Feb 81      REQUISITION NO. 27-1910-1942- G

### III. SCOPE OF WORK

- A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.
- B. The following equipment and services will be provided by others:
1. Foundation and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
  2. Installation and erection of all equipment and piping.
  3. Interconnecting piping between individual equipment skids.
  4. Interconnections, pneumatic and electrical, between equipment skids.
  5. All finish painting.
  6. Tracing and insulation for piping and equipment; however, insulation support rings or studs which are required on vessels shall be furnished by the vendor.
  7. Motor starters for all drivers.
  8. Sumps and sewers.
- C. The following equipment and services shall be provided by the vendor:
1. The dissolved air flotation unit (Item S-2702 A/B) to be supplied shall include, but not necessarily be limited to, the following equipment:
    - Air flotation tank(s) w/flocculation equipment and flash mixer
    - Recycle pump(s) and spare(s)
    - Air dissolving tank(s)
    - Skimming equipment
    - All integral piping



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 4 OF 12

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942-G
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### III. SCOPE OF WORK (cont'd.)

#### D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items:
  - A. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - B. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).
  - C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).
2. The following items will be provided by the purchaser:
  - A. Electronic controllers
  - B. Indicators
  - C. Alarms
  - D. Programmable controller digital logic
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

### IV. DESIGN DATA

#### A. Process Requirements

Each dissolved air flotation unit shall be capable of removing oils, grease and suspended solids from a coal gasification waste water stream.

1. Design flow, GPM	115
2. Normal flow, GPM	<u>70</u>
3. Max. recycle rate	<u>50%</u>
4. Temperature range	<u>Ambient</u>
5. Water pressure at inlet	<u>15 psig</u>
6. Air dissolution	<u>90% Sat. (Min.)</u>

(Minimum retention time in dissolution tank shall be 2 minutes)

FORM NO. 135-803

C2





# REQUISITION



PAGE 6 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2

DATE 6 Feb 91

REQUISITION NO. 27-1910-1942 G

### V. EQUIPMENT DESIGN AND CONSTRUCTION

- A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standard practices.
- B. Clear spacing between adjacent units on a skid shall be a minimum of 12 inches.
- C. Piping for each skid shall be manifolded to yield single flanged connection for each inlet or outlet service for the skid.
- D. Flotation Tank(s)
  1. Skid mounted flotation tank(s) shall be provided, sized to handle the design flow.
  2. Each tank shall be welded steel construction. All internals, valves, fittings and interconnecting piping shall be of suitable corrosion resistant material.
  3. Tank may be rectangular or circular.
  4. An integral float-collecting flume is required with a single discharge connection.
  5. Piping shall be manifolded, as required, to provide a single water inlet connection, a single water outlet connection, a single froth outlet connection, and a single sludge outlet connection.
  6. Skimmer paddles shall be electric motor driven.
  7. Sediment (sludge) shall be removed via a rotary screw or scraper system.
  8. Motor drives shall be in accord with Job Specification 1910-38A6, Low Voltage NEMA Frame TEFC & XP Induction Motors.

FORM NO. 135-902



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 7 OF 12

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942.G
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V. EQUIPMENT DESIGN AND CONSTRUCTION (cont'd)

E. Recycle Pumps

1. Two motor driven, centrifugal pumps, one normally operating one spare, shall be provided for each DAF tank to recycle DAF effluent water. This water will be aerated, thus providing necessary dissolved air to the flotation tank.
2. Pumps and drivers shall be in accord with Job Specification 1910-31A3, Centrifugal Pumps for General Duty Service, and 1910-38A6, Low Voltage NEMA Frame TEFC and XP Induction Motors.
3. All piping to and from the pumps shall be provided by the vendor. Piping shall include, for each pump, a suction block valve, discharge check valve, and discharge block valve. A pressure indicator shall also be provided on the discharge of each pump.

F. Dissolving Tank

1. The dissolving tank(s) shall be of welded steel construction in accord with Job Specification 1910-10A1, Welded Unfired Pressure Vessels.
2. All instruments and controls necessary for proper dissolution are to be provided by the vendor.
3. All interconnecting piping, fittings, and valves, shall be furnished by the vendor, with one connection being provided for air supply.

G. Instruments

1. All instruments and controls required for proper operation of the dissolved air flotation unit shall be furnished by the vendor. They shall be in accord with Job Specification 1910-60A1, Instrumentation.

H. Electrical

1. Electrical components furnished by the vendor shall be in accord with Job Specification 1910-78A4, Electrical Requirements for Packaged Systems.

FORM NO. 135-803



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 8 OF 12

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942 G
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### VI. GUARANTEE

- A. The vendor shall guarantee that the dissolved air flotation unit when installed and operated in accordance with his instructions, will be capable of the following:
1. Treating the quoted quantities of wastes at the specified rates.
  2. Producing and effluent with a quality as required by this requisition.
- B. For mechanical guarantee, see commercial papers.

### VII. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Normal and maximum air demand of the system in standard cubic feet per minute (SCFM).
- b) Piping and instrument diagram showing vessels, pumps, piping and controls. This diagram shall clearly indicate the vendor's scope of supply.
- c) An itemized descriptive list of equipment, valves, piping and controls.
- d) Electricity, plant and instrument air requirements.
- e) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- f) An itemized list of exceptions to this requisition.
- g) The following equipment data shall be completed and returned with the vendor's proposal.

1. Flotation Tank-Size: \_\_\_\_\_
  - Material: \_\_\_\_\_
  - Weight-Empty: \_\_\_\_\_ LB
  - Operating: \_\_\_\_\_ LB
  - Number of cells: \_\_\_\_\_
  - Nozzle sizes and rating: \_\_\_\_\_
  - Water inlet: \_\_\_\_\_
  - Water outlet: \_\_\_\_\_
  - Floated material outlet: \_\_\_\_\_
  - Drain: \_\_\_\_\_
  - Sludge outlet: \_\_\_\_\_
  - Number of tanks: \_\_\_\_\_ Two

FORM NO. 135-902



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942 G
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### VII. VENDOR's BID INFORMATION (cont'd.)

2. Skimming Equipment - Type: \_\_\_\_\_  
 - Type of Drive: \_\_\_\_\_  
 - Driver Horsepower: \_\_\_\_\_  
 - Material: \_\_\_\_\_  
 - Speed: \_\_\_\_\_ RPM
  
3. Sludge Removal - Type \_\_\_\_\_  
 - Driver \_\_\_\_\_  
 - Driver Horsepower \_\_\_\_\_  
 - Speed \_\_\_\_\_ RPM  
 - Material \_\_\_\_\_
  
4. Flocculation - Type \_\_\_\_\_  
 - Material \_\_\_\_\_  
 - Speed, Flocculator/Motor \_\_\_\_\_ RPM  
 - Motor Horsepower \_\_\_\_\_
  
5. Flash Mixer - Type \_\_\_\_\_  
 - Material \_\_\_\_\_  
 - Speed \_\_\_\_\_ RPM  
 - Motor Horsepower \_\_\_\_\_
  
6. Dissolving Tank - Size: \_\_\_\_\_  
 - Material: \_\_\_\_\_  
 - Des. Pressure: \_\_\_\_\_ PSIG  
 - Des. Temperature: \_\_\_\_\_ °F  
 - Weight-Empty: \_\_\_\_\_ LB  
     - Operating: \_\_\_\_\_ LB  
 - Dissolved Gas Req'd.: \_\_\_\_\_ SCFM  
 - Retention Time: \_\_\_\_\_  
 - Liquid Levels  
     Normal: \_\_\_\_\_  
     High: \_\_\_\_\_  
     Low: \_\_\_\_\_
  
7. Recycle pumps - See Data Sheet Pg. 10
8. Motors - See Data Sheet Pg. 11
9. Shipping Weight of each skid.
10. Overall skid dimensions.

FORM NO. 135-902



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 10 OF 12

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	27-1910-1942 G	14 Jul 80
MATERIAL	CENTRIFUGAL PUMP	NO. REQ'D.	C1 4 Sep 80	C4
SERVICE			C2 6 Feb 81	C5
MFR.	MODEL	SIZE	C3	C6
1	OPERATING CONDITIONS, EACH PUMP		PERFORMANCE	
2	LIQUID	U. S. GPM RATED	PROPOSAL CURVE NO.	
3	PUMPING TEMP DEG F	U. S. GPM NORMAL	SPEED RPM	NO. STAGES
4	MAX. P T, DEG F	MAX SUCTION PSIG	NPSHR, FT (H <sub>2</sub> O)	MIN CONT. GPM
5	S. G. AT PT	DISCH. PRESS. PSIG	SHUTOFF HD. FT	% EFF. @ RATED GPM
6	VAP. PRESS., PSIA @ PT	SUCT. PRESS., PSIG	BHP @ RATED GPM	MAX BHP
7	VISC. @ PT, CP	DIFF. PRESS., PSI	IMPELLER DIA. IN	RATED MAX MIN
8	CORR./ EROS. FROM	DIFF. HEAD, FT	MAX. ALLOW. CASING PSIG/DEG F	
9		NPSH AVAIL, FT	HYDROSTATIC TEST PRESS. PSIG	
10	PCT & SIZE SOLIDS	(MEAS. TO <input type="checkbox"/> PUMP <input type="checkbox"/> SUCT. FLG)	MAX POSSIBLE DISCH. PRESS. PSIG	
11	CONSTRUCTION		ROTATION FACING COUPLING <input type="checkbox"/> CW <input type="checkbox"/> CCW	
12	CASING SPLIT	<input type="checkbox"/> AXIAL <input type="checkbox"/> RADIAL	CONNECTIONS	SUCTION DISCHARGE
13	CASING VOLUTE	<input type="checkbox"/> SINGLE <input type="checkbox"/> DOUBLE <input type="checkbox"/> DIFFUSER	SIZE, INCHES	
14	CASING SUPPORT	<input type="checkbox"/> FOOT <input type="checkbox"/> CENTERLINE	RATING/FACING	
15		<input type="checkbox"/> BRACKET <input type="checkbox"/> VERTICAL IN-LINE	LOCATION	
16	CASING CONNS.	<input type="checkbox"/> VENT <input type="checkbox"/> DRAIN <input type="checkbox"/> GAUGE <input type="checkbox"/>	DRIVER	
17	IMPELLER TYPE		FURNISHED BY	<input type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS
18	IMPELLER MTG.	<input type="checkbox"/> BETWEEN BRGS <input type="checkbox"/> OVERHUNG	MOUNTED BY	<input type="checkbox"/> PUMP MFR <input type="checkbox"/> OTHERS
19	WEAR RINGS	<input type="checkbox"/> CASING <input type="checkbox"/> IMPELLER <input type="checkbox"/> INLET <input type="checkbox"/> BACK	<input type="checkbox"/> MOTOR: ITEM NO.	TYPE
20	BEARINGS-TYPE:	RADIAL THRUST	HP	RPM FRAME NO.
21	BEARINGS-LUBE:	<input type="checkbox"/> RING <input type="checkbox"/> FLOOD <input type="checkbox"/> FLINGER	ENCL.	INSUL. S. F.
22		<input type="checkbox"/> OIL MIST <input type="checkbox"/> PRESSURE LUBE	MFR	V PH HZ
23	COUPLING: MFR	TYPE GUARD TYPE	FLA	LRA LUBE
24	DRIVER HALF MTD BY	<input type="checkbox"/> PUMP MFR <input type="checkbox"/> DRIVER MFR <input type="checkbox"/> OTHERS	THRUST (VERT)	LB UP DOWN
25	SHAFT SEAL TYPE	<input type="checkbox"/> PACKING <input type="checkbox"/> MECHANICAL	<input type="checkbox"/> TURBINE: ITEM NO.	MFR.
26	PACKING MFR, TYPE	SIZE NO. RINGS	REFER TO PAGE , ATTACHED	
27	SEAL MFR, MODEL	TYPE	TESTS	REQUIRED WITNESSED CERTIFIED
28	MFR, CODE	API CODE	SHOP INSPECT	<input checked="" type="checkbox"/>
29	BASEPLATE	<input type="checkbox"/> EXTENDED FOR DRIVER <input type="checkbox"/> DRAIN RIM	PERFORMANCE	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
30			NPSHR	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
31	WATER COOLING & SEAL FLUSH PIPING		HYDROTEST	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
32	WATER COOLED	<input type="checkbox"/> BEARINGS <input type="checkbox"/> STUFFING BOX JACKET		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
33		<input type="checkbox"/> GLAND <input type="checkbox"/> PEDESTALS	MATERIALS - API CLASS-	
34	C. W., PLAN	WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE	CASING	IMPELLER
35	TOTAL COOLING WATER REQUIRED, GPM		SHAFT	SLEEVE
36	SEAL FLUSH, PLAN	WITH <input type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> TUBING <input type="checkbox"/> PIPE	WEAR RINGS	GLAND
37	EXT. FLUSH, LIQUID	@ DEG F GPM PSIG	BASEPLATE	
38			WEIGHTS, LBS EACH	
39	ACCESSORIES FURNISHED BY PUMP MFR		PUMP	BASEPLATE
40	<input type="checkbox"/> SEAL FLUSH PIPING	<input type="checkbox"/> STEAM JACKETING	MOTOR	TURBINE
41	<input type="checkbox"/> COOLING WATER PIPING	<input type="checkbox"/>	SITE & UTILITIES (Per Pg 5)	
42	<input type="checkbox"/> OIL PIPING	<input type="checkbox"/>	<input type="checkbox"/> INDOORS	<input type="checkbox"/> OUTDOORS
43	<input type="checkbox"/> MINIMUM FLOW ORIFICE	<input type="checkbox"/>	AMBIENT	DEG F MAX TO DEG F MIN
44	NOTES		CL	GR DIV <input type="checkbox"/> NON-HAZARDOUS
45			ALT. FT	COOLING WATER SOURCE
46			DEG F: IN, OUT: PSIG	IN, OUT
47			DOCUMENTS	
48			<input type="checkbox"/>	-1300A <input type="checkbox"/>
49			<input type="checkbox"/>	<input type="checkbox"/>
50				
51				
BY	P. O. NO.	VENDOR		

FORM NO. 135-302

FORM 135-49

F.W.C. CONTRACT <u>15-1910</u>	REQUISITION NUMBER <u>27-1910-1942 G</u>	DATE <u>14 Jul 80</u>
FOR: <u>Conoco/DOE</u>	SUPERSEDED BY CHANGE NO.:	
SITE: <u>Noble County, Ohio</u>	C1 <u>4 Sep 80</u>	C3 <u>C5</u>
MANUFACTURER:	C2 <u>6 Feb 81</u>	C4 <u>C6</u>

**APPLICABLE DOCUMENTS:**

MOTOR SPECIFICATION \_\_\_\_\_

PREP. FOR SHIPMENT \_\_\_\_\_

GENERAL NOTES \_\_\_\_\_

**SITE DATA:** (Per Pg 5)

ALTITUDE \_\_\_\_\_ FT.      BAROMETER \_\_\_\_\_

AMBIENT \_\_\_\_\_ °F. MAX. TO \_\_\_\_\_ °F. MIN.

ATMOSPHERE \_\_\_\_\_

INSTALLED     INDOOR     OUTDOOR     \_\_\_\_\_

AREA     CL.    -GR.    -DIV.     NON-HAZARDOUS.

<u>ITEM NUMBERS:</u>						
TOTAL QUANTITY						
DRIVEN EQUIPMENT						
HP NAMEPLATE RATING						
SERVICE FACTOR						
RPM AT FULL LOAD/ NO. POLES	/	/	/	/	/	/
VOLTS/PHASES/HERTZ	/	/	/	/	/	/
ENCLOSURE						
°C. RISE AT FULL S.F. LOAD						
TEMP. MEASUREMENT METHOD						
INSULATION CLASS						
INSUL. SPECIAL TREATMENT						
SPECIAL HARDWARE						
FRAME NUMBER						
MOUNTING ASSEMBLY NUMBER						
ROTATE FROM END OPP. CPLG.						
BEARINGS TYPE						
LUBRICATION						
END FLOAT (IF APPL.) INS.						
N.E.M.A. DESIGN LETTER						
AMPS.: F.L./LOCKED ROTOR	/	/	/	/	/	/
LOCKED ROTOR LIMIT, SECS.						
EFFIC. 100%/75%/50% LOAD	/	/	/	/	/	/
% P.F. 100%/75%/50% LOAD	/	/	/	/	/	/
<b>ACCESSORIES:</b>						
BASE						
SPACE HEATERS:      WATTS						
VOLTS/PH/Hz	/	/	/	/	/	/
TEMP. DETECTORS:    NUMBER						
TYPE						
AIR FILTERS						
MOUNTING COUPLING HALF						
<b>TESTS:</b> (W = WITNESSED)						
N.E.M.A. STD. COMMERCIAL						
TEST CERTIFICATES REQ'D.						
<b>WEIGHTS:</b> (LBS.)						
NET/GROSS	/	/	/	/	/	/
MAX. NORMAL MAINTENANCE						



# REQUISITION

PAGE 12 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942G
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The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

1910-1900A	General Notes for Miscellaneous Equipment
1910-10A1	Welded Unfired Pressure Vessels
1910-31A3	Centrifugal Pumps for General Duty Service
1910-38A6	Low Voltage NEMA Frame TEFC and XP Induction Motors
1910-50A21.040	Piping Material Spec. "Lc"
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Systems
1910-83A1	Painting
1910-88C1	Welding Requirements for Equipment and Piping
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

FORM NO. 135-903



# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I To Req. 27-1910-1942G

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

#### Special Applications

Clow, Jamesbury, Posi-Seal

### Flow

#### Differential Pressure Transmitter

Barton, Rosemount, Foxboro

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Venturi, Flow Nozzle, Etc.

B.I.F., Daniel Industries, Vickery-Simms

#### Flow Switches

Barton, Magnetrol, Peeco

#### Flow Glasses

Brooks, Fischer, & Porter, Jergusen

### Level

#### Differential Pressure Transmitter

Foxboro, Taylor, Rosemount



Displacement

Magnetrol International, Fisher Controls, Foxboro

Gauge Glasses

Daniel Industries, Jerguson Valve & Gauge, Penberthy Houdaille

Float Switches

Magnetrol International, Fisher Controls, Delta Controls

Pressure

Transmitters

Foxboro, Taylor, Rosemount

Local Controllers

Fisher Controls, Foxboro, Taylor

Relief Valves

Consolidated, Crosby Valve & Gauge, Farris Engineering

Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge

Temperature

Dial Thermometers

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Palmer Instruments.



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

CLIENT <u>Conoco/DOE</u>	CONTRACT NO. <u>15-1910</u>	REQUISITION NO.		DATE
SITE <u>Noble County, Ohio</u>	ITEM NO. <u>A-2702</u>	<u>27-1910-1944A</u>		<u>30 Jul 80</u>
MATERIALS <u>Sanitary Treatment System</u>		C1	<u>17 Sep 80</u>	C4
OR		C2	<u>6 Feb. 81</u>	C5
SERVICE		C3		C6

Design, fabricate, and furnish all equipment required for a sanitary treatment system to meet the requirements set forth therein.

**I. GENERAL**

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

J. J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468

- E. All equipment covered by this requisition will be located outdoors, installed inground.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and identified at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-901

BY <u>J. KUNYZ</u>	P.O. NO.	SUPPLIER
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# REQUISITION

PAGE 2 OF 12

FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb. 81	REQUISITION NO. 27-1910-1944A
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I. GENERAL (cont'd.)

G. Equipment shall receive the following tests before shipment:

1. Certified hydrostatic test of individual vessels.
2. Hydrostatic test of assembled skids.
3. Functional electrical test.
4. Manufacturer's standard shop tests for various components.

H. The system of measurement shall be English.

J. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

1. Specification and drawings, etc., which are furnished by the PURCHASER are listed on Page 12 of this requisition.
2. Other referenced drawings, specifications, standards and publications not listed are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

B. Codes

1. All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 12

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1944A

### III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

B. The following equipment and services will be provided by others:

1. Foundation and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
2. Installation and erection of all equipment and piping.
3. Interconnecting piping between individual equipment skids.
4. Interconnections, pneumatic and electrical, between equipment skids.
5. All finish painting.
6. Tracing and insulation for piping and equipment; however, insulation support rings or studs which are required on vessels shall be furnished by the vendor.
7. Motor starters for all drivers, and electrical cable.
8. Sumps and sewers.

C. The following equipment and services shall be provided by the vendor:

The sanitary treatment package shall include, but not necessarily be limited to the following items:

- Equalization tank & pumps.
- Aeration tank.
- Clarifier and skimming mechanism
- Aeration blower and diffusers.
- Hypochlorite addition system and chlorination tank.
- Return sludge piping.
- Waste sludge pump.
- Foam control spray piping and pump.
- Comminutor

FORM NO. 135-902

# REQUISITION



PAGE 4 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 2 Feb. 81      REQUISITION NO. 27-1910-1944A

### III. SCOPE OF WORK (cont'd.)

#### D. Scope of Instrumentation

1. The Vendor shall supply the following instruments items:
  - A. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - B. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).
  - C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).
2. The following items will be provided by the purchaser:
  - A. Electronic controllers.
  - B. Indicators.
  - C. Alarms.
  - D. Programmable controller digital logic.
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

### IV. DESIGN DATA

#### A. Process Requirements

The sanitary treatment system shall be capable of treating sanitary wastewater generated by plant personnel.

1. Design flow, 22000 GPD
2. Temperature range Ambient
3. This system shall be designed to meet State of Ohio, secondary treatment standards.

FORM NO. 135-933



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 12

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1944A
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### IV. DESIGN DATA (cont'd.)

#### B. Utilities available are:

##### 1. Electrical Equipment Utilization Voltage

###### SERVICE

###### POWER

Instruments	115 v/1 Phase/60 Hz
<1/2 HP Motors	115v/1 Phase/60 Hz
1/2-200 HP Motors	460v/3 Phase/60 Hz

Area classification: Non-Hazardous (Unclassified)

2. Air - Plant and instrument air available at 100 psig, 100°F.

#### C. Site Data

1. Elevation above sea level (ft) 1050 (approx.)

2. Winter design temperature (°F) -10

3. Summer ambient temperature (°F) 92 (Max.)

### V. EQUIPMENT DESIGN AND CONSTRUCTION

A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standards practices.

B. Clear spacing between adjacent units on a skid shall be a minimum of 12 inches.

C. Piping for each skid shall be manifolded to yield a single flanged connection for each inlet or outlet service for the skid.

#### D. Equalization Compartment

1. An equalization compartment shall be provided upstream of the aeration compartment. It shall be sized to provide a reasonable amount of holdup and to accommodate surges of influent flow.

2. The entire system shall be suitable for inground installation.

3. A pump and spare shall be provided to transfer the contents of the equalization compartment to the aeration compartment.

FORM NO. 135-802



# REQUISITION

PAGE 6 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1944A
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### V. EQUIPMENT DESIGN AND CONSTRUCTION (cont'd.)

#### E. Aeration Compartment

1. The aeration compartment shall be sized to provide a minimum detention time of 24 hours based on design capacity.
2. Air diffusers and piping shall be provided to evenly disperse air throughout the aeration tank.

#### F. Clarifier (Settling Tank)

1. A clarifier compartment shall be provided to permit settling of suspended material (sludge).
2. The clarifier shall have a maximum hydraulic loading of 600 GPD/FT<sup>2</sup>, based on the design flow.

#### G. Sludge System

1. Settled sludge shall be returned to the inlet end of the aeration tank. This shall be accomplished either by pumping or with an air lift system.
2. A pump and spare shall be provided to remove waste sludge and to transfer it for further treatment.

#### H. Hypochlorite System

1. A hypochlorite addition system and tank are to be provided at the outlet of the clarifier as a final treatment step before discharging the effluent.

#### I. Foam Control

1. To minimize foaming in the aeration tank a spray system shall be provided consisting of a pump and spray nozzles. As an alternate, the vendor may furnish just the spray nozzles to utilize service water supplied at 75 psig.

#### J. Air Blowers

1. The vendor shall furnish two motor-driven air blowers (one operating, one spare) to provide air to the diffusers for biological treatment.
2. For the design of the blowers, inlet air shall be taken as 92°F, 100% humidity.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 12

CHANGE NO. 2      DATE 2 Feb. 81      REQUISITION NO. 27-1910-1944A

V. EQUIPMENT DESIGN AND CONSTRUCTION (cont'd)

K. Motors

1. All motors furnished by the vendor shall comply with Job Spec. 1910-38A6, Low Voltage NEMA Frame TEFC and XP Induction Motors.

L. Piping

1. All piping furnished shall comply with Job Spec. 1910-50A1, Piping; 1910-50A21.040, Piping Material Spec. "Lc"; 1910-50A22.030, Piping Material Spec. "Mb".

M. Electrical/Instruments

1. All instruments and electrical components furnished by the vendor shall comply with Job Spec. 1910-60A1, Instrumentation and 1910-78A4, Electrical Requirements for Packaged Units.

VI. GUARANTEE

- A. The vendor shall guarantee that the sanitary treatment system when installed and operated in accordance with his instructions, will be capable of treating the quoted quantities of wastes at the specified rates.
- B. For mechanical guarantee, see inquiry documents.

VII. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram showing vessels, pumps, piping and controls. This diagram shall clearly indicate the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) The following equipment data shall be completed and returned with the vendor's proposal.

FORM NO. 135-902





# REQUISITION

PAGE 8 OF 12

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb. 81	REQUISITION NO. 27-1910-1944A
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### VII. VENDOR'S BID INFORMATION (cont'd.)

#### F) (cont'd.)

- Equalization Tank - Size: \_\_\_\_\_  
 - Material: \_\_\_\_\_  
 - Weight-Empty: \_\_\_\_\_ LB  
 - Operating: \_\_\_\_\_ LB  
 - Capacity: \_\_\_\_\_ Gals.  
 - Nozzle sizes and rating:  
 Water inlet: \_\_\_\_\_  
 Water outlet: \_\_\_\_\_  
 Drain: \_\_\_\_\_

- Transfer Pumps - Type \_\_\_\_\_  
 Manufacturer \_\_\_\_\_  
 Model \_\_\_\_\_  
 Flow, GPM \_\_\_\_\_  
 Head, Feet \_\_\_\_\_  
 BHP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 Material \_\_\_\_\_

- Aeration Tank Size \_\_\_\_\_  
 Material \_\_\_\_\_  
 Weight-Empty, LBS \_\_\_\_\_  
 - Operating, LBS \_\_\_\_\_  
 Capacity, GALS. \_\_\_\_\_  
 Retention Time \_\_\_\_\_

- Diffusers - Manufacturer \_\_\_\_\_  
 Model \_\_\_\_\_  
 Material \_\_\_\_\_  
 Number furnished \_\_\_\_\_  
 Air flow, SCFM, each \_\_\_\_\_

5. Aeration blowers - see data sheet pg. 10.

- Clarifier tank - Size \_\_\_\_\_  
 Material \_\_\_\_\_  
 Weight-Empty, LBS \_\_\_\_\_  
 -Oper., LBS: \_\_\_\_\_  
 Capacity, Gals. \_\_\_\_\_  
 Hydraulic loading, GPD/FT<sup>2</sup> \_\_\_\_\_

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 9 OF 12

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1944A

VII. VENDOR'S BID INFORMATION (cont'd.)

f) (cont'd.)

7. Sludge return - Type \_\_\_\_\_  
Flow, GPM \_\_\_\_\_

8. Sludge pump - Type \_\_\_\_\_  
Manufacturer \_\_\_\_\_  
Model \_\_\_\_\_  
GPM \_\_\_\_\_  
Head, Feet \_\_\_\_\_  
Speed, RPM \_\_\_\_\_

9. Hypochlorite  
Manufacturer \_\_\_\_\_  
Model \_\_\_\_\_  
Dosage Rate, ppm (Design) \_\_\_\_\_  
Tank - Size \_\_\_\_\_  
Material \_\_\_\_\_  
Weight-Empty \_\_\_\_\_  
Oper. \_\_\_\_\_

10. Foam Control -  
Pump - Type \_\_\_\_\_  
Manufacturer \_\_\_\_\_  
Model \_\_\_\_\_  
Capacity, GPM \_\_\_\_\_  
Spray Nozzles \_\_\_\_\_  
Manufacturer \_\_\_\_\_  
Number \_\_\_\_\_

11. Motors - See data sheet Pg. 11.

FORM NO. 135-802



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 10 OF 12

CLIENT <b>CONOCO / DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO.		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO. <b>A-2702</b>		<b>27-1910-1944A</b>		<b>30 JUL 80</b>	
MATERIAL <b>FAN/BLOWER</b>		NO. REQ'D.		C1	<b>17 Sep 80</b>	C4	
SERVICE				C2	<b>6 Feb. 8</b>	C5	
MFR.		MODEL		C3		C6	
<b>GAS HANDLED</b>				<b>PERFORMANCE</b>			
1	Gas <b>AIR</b>	Inlet Density	Lb/Ft <sup>3</sup>	Max. Cap.	ACFM	Turndown Ratio	
2	Composition			Oper. Speed		First Critical	RPM
3	Wt %			Fan Eff.	%	Fan WR <sup>2</sup>	Lbs-Ft <sup>2</sup>
4	Inlet Temp. <b>92 (max) F</b>	Inlet Press. <b>14.21 PSIA</b>	<del>in W.C.</del>	BHP @ Shaft		Drive Eff.	%
5	<input type="checkbox"/> Corrosive	<input type="checkbox"/> Toxic	<input type="checkbox"/>	<b>DRIVE</b>			
6	<b>OPERATING CONDITIONS</b>			<input type="checkbox"/> Constant Speed	<input type="checkbox"/> Variable Speed		
7	Capacity		ACFM	<input type="checkbox"/> Gear Reducer: Mfr.	Model		
8	Static Press. Rise		In W.C.	Rated HP	AGMA SF		
9	Barometric Pressure	<b>14.21</b>	PSIA	RPM In/Out	/	Lubrication	
10	Dust Loading		Grains/ACF	<input type="checkbox"/> Couplings Type	Mfr		
11	<input type="checkbox"/> Abrasive	<input type="checkbox"/> Sticky	<input type="checkbox"/>	<input type="checkbox"/> Belt	<input type="checkbox"/> Direct	RPM In/Out	/
12	Duty	<input type="checkbox"/> Continuous	<input type="checkbox"/> Intmt	<input type="checkbox"/> Drive Guards (Removable Rigid Steel)			
13	<b>CONSTRUCTION DETAILS</b>			Motor By	<input checked="" type="checkbox"/> Vendor	<input type="checkbox"/> Others	
14	Type	<input type="checkbox"/> Centrifugal	<input type="checkbox"/> Axial	HP	SF	RPM	Frame
15	Arrangement	<input type="checkbox"/> SWSI	<input type="checkbox"/> DWDI	V,	PH,	HZ	Encl.
16	AMCA Arrg't. No.		Class No.	Type	Mfr.		
17	Disch.	<input type="checkbox"/> Top Horiz	<input type="checkbox"/> Upblast	<input type="checkbox"/>	Insul. Cl.	Brq's	Lube
18	Rot'n. Viewed From Drive End	<input type="checkbox"/> CW	<input type="checkbox"/> CCW	Rise <sup>OC</sup>	FL Amps	LR Amps	
19	Impeller	<input type="checkbox"/> Airfoil	<input type="checkbox"/> Radial Tip	<b>AUXILIARIES</b>			
20	Dia.	Width	No. of Blades	<input type="checkbox"/> Inlet Screen	<input type="checkbox"/> Inlet Filter		
21	Blade Mat'l.		Thk.	<input type="checkbox"/> Inlet	<input type="checkbox"/> Outlet	<input type="checkbox"/> Guide Vanes	<input type="checkbox"/> Damper
22	<input type="checkbox"/> Blade Liner Mat'l.		Thk.	<input type="checkbox"/> Auto Operator For Capacity Control			
23	Housing	<input type="checkbox"/> Split for Wheel Removal		Type	Mfr.		
24	Scroll Mat'l.		Thk.	<input type="checkbox"/> Silencers	<input type="checkbox"/> Inlet	<input type="checkbox"/> Outlet	
25	Side Plate Mat'l.		Thk.	Type	Mfr.		
26	<input type="checkbox"/> Liners	<input type="checkbox"/> Side Pl.	<input type="checkbox"/> Scroll	<input type="checkbox"/>			
27	Mat'l.		Thk.				
28	Gas Inlet Size	<input type="checkbox"/> Flanged		<b>SHOP TESTS</b>		<b>REQ'D</b>	<b>WITNESSED</b>
29	Gas Outlet Size	<input type="checkbox"/> Flanged		Static/Dynamic Bal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	<input type="checkbox"/> Access Door Size		No.	Mech. Run Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	<input type="checkbox"/> Drain Conn. Size		Plugged	Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	<input type="checkbox"/> Inlet Box(es) Mat'l.		Thk.	<b>SITE DATA</b>			
33	<input type="checkbox"/> Liner Mat'l.		Thk.	Ambient	<b>92 °F Max. To -10 °F Min.</b>		
34	Shaft Dia.	Mat'l.		Installed	<input type="checkbox"/> Indoors	<input checked="" type="checkbox"/> Outdoors	
35	Casing Seal Type & Mat'l.			Cl	Gr	Div	<input checked="" type="checkbox"/> Non-Hazardous
36	<input type="checkbox"/> Purge With		Conn. Size	Altitude @ Gr. Above Sea Level		<b>1050 Ft</b>	
37	<input type="checkbox"/> Shaft Heat Slinger			<b>UTILITIES AVAILABLE</b>			
38	Bearings	<b>B-10 Life</b>	Hrs.	Air @	<b>100 PSIG</b>	<b>100 °F</b>	
39	<input type="checkbox"/> Anti-Friction Type	<input type="checkbox"/> Sleeve		Electricity	V,	PH,	HZ
40	Lube	<input type="checkbox"/> Grease	<input type="checkbox"/> Forcd Recirc. Oil	Water @	PSIG and °F		
41	Press.: Oper.	Shutdown	PSIG	<b>APPLICABLE DOCUMENTS</b>			
42	Temp.: Oper.	Shutdown	°F	<b>PER Pg. 12.</b>			
43	<input type="checkbox"/> Cooling Water Req't.		GPM/Brg				
44	Weight of Rotor Assembly		Lbs.				
45	Total Weight		Lbs.				
46	<b>NOTES</b>						
47	1. BLOWER INLET CONDITIONS FOR DESIGN: 92 °F,						
48	100% HUMIDITY.						
49							
50							
51							
BY	P. O. NO.			VENDOR			



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 11 OF 12

CLIENT <u>CONOCO / DOE</u>		CONTRACT <u>15-1910</u>		REQUISITION		DATE	
SITE <u>NOBLE COUNTY, OHIO</u>				<u>27-1910-1944A</u>		<u>30 JUL 80</u>	
MATERIAL <u>SQUIRREL CAGE INDUCTION MOTOR(S),</u>				C1	<u>17 Sep 80</u>	C4	
<input type="checkbox"/> HORIZONTAL <input type="checkbox"/> VERTICAL				C2	<u>6 Feb. 81</u>	C5	
MANUFACTURER				C3		C6	
1	ITEM(S):						
2							
3	QUANTITY						
4	DRIVEN EQUIPMENT						
5	NAMEPLATE HP						
6	SERVICE FACTOR						
7							
8	FL RPM/NO. OF POLES	/	/	/	/	/	/
9	VOLTS/PH/HZ	//	//	//	//	//	//
10	ENCLOSURE TYPE						
11	°C RISE/40°C @ SF LOAD						
12	TEMP. MEASUREMENT METHOD						
13	INSULATION CLASS						
14	THERMAL PROTECTOR TYPE						
15	NEC TEMP. IDENT. NO.						
16	FRAME SIZE NO.						
17	MOUNTING ASSEMBLY						
18	ROTATION FROM END OPP. CPLG.						
19	BEARINGS TYPE						
20	LUBRICATION						
21	NEMA LR CODE						
22	NEMA DESIGN						
23	AMPS., FL/LR	/	/	/	/	/	/
24	LOCKED ROTOR LIMIT, SECS.						
25	% EFFIC. 100%/75%/50% LOAD	/	/	/	/	/	/
26	% P.F. 100%/75%/50% LOAD	/	/	/	/	/	/
27	NOISE LEVEL (dBA @ 3 FT)						
28	SPECIAL REQUIREMENTS:						
29	MOUNT HALF-COUPLING						
30	SPACE HEATERS WATTS						
31	VOLTS/PH/HZ	//	//	//	//	//	//
32	SUITABLE FOR V-BELT DRIVE						
33	SLIDE BASE						
34							
35	WEIGHT:						
36	MOTOR & (IF APPLIC.) BASE						
37	TESTS:						
38	N.E.M.A. STD. COMMERCIAL						
39							
40	TEST CERTIFICATES REQUIRED						
41	NOTES:						
42							
43							
44							
45	APPLICABLE DOCUMENTS: <u>PER Pg 12.</u>	BASIC DESIGN DATA:					
46	MOTOR SPECIFICATION <u>1910 -38A6</u>	ALTITUDE <u>1050 FT.</u>					
47		AMBIENT <u>92 °F MAX. -10 °F MIN.</u>					
48		INSTALLATION <input type="checkbox"/> INDOOR <input checked="" type="checkbox"/> OUTDOOR <input type="checkbox"/>					
49	PREP. FOR SHIP'T. SPEC. <u>1910 -97A1</u>	ELEC. AREA <input type="checkbox"/> CL. <input type="checkbox"/> GRP(S). <input type="checkbox"/> DIV.					
50	GENERAL NOTES REQ'N. <u>-1300A</u>	<input checked="" type="checkbox"/> NON-HAZARDOUS					
51							
8Y		P. O.		VENDOR			

FORM NO. 135-323B



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 12 OF 12

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1944A

The following documents are to be considered an integral part of this requisition

All design and fabrication shall comply with these referenced documents.

SPEC NUMBER

TITLE

1910-38A6	Low Voltage NEMA Frame TEFC & XP Induction Motors
1910-38A7	Medium Voltage and Non-NEMA Frame Induction Motors
1910-40A1	Wind, Earthquake and Snow Loading
1910-40A2	Design Loadings for Equipment Structures & Foundations
1910-50A1	Piping
1910-50A21.040	Piping Material Spec. "Lc"
1910-50A22.030	Piping Material Spec. "Mb"
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Units
1910-83A1	Painting
1910-88C1	Welding Requirements
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

REQUISITION NUMBER

1910-1900A	General Notes for Miscellaneous Equipment
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# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1944A

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

#### Special Applications

Clow, Jamesbury, Posi-Seal

### Flow

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Venturi, Flow Nozzle, Etc.

B.I.F., Daniel Industries, Vickery-Simms

#### Flow Switches

Barton, Magnetrol, Peeco

#### Flow Glasses

Brooks, Fischer & Porter, Jergusen

### Level

#### Displacement

Magnetrol International, Fisher Controls, Foxboro

#### Gauge Glasses

Daniel Industries, Jurguson Valve & Gauge, Penberthy Houdaille



## FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

### Float Switches

Magnetrol International, Fisher Controls, Delta Controls

### Pressure

### Transmitters

Foxboro, Taylor, Rosemount

### Local Controllers

Fisher Controls, Foxboro, Taylor

### Relief Valves

Consolidated, Crosby Valve & Gauge, Farris Engineering

### Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

### Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge

### Pressure Differential (for filters)

Orange Research, Meriam, Midwest Instruments

### Temperature

### Thermo Couples and Wells

Temtex, Tempo, Thermo Electric

### Dial Thermometers

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Palmer Instruments



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 8

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE
SITE	Noble County, Ohio	ITEM NO.	A-2705	27-1910-1942H		23 July 80
MATERIAL	Carbon Adsorption System			C1	23 Sep 80	C4
OR				C2	6 Feb. 81	C5
SERVICE				C3		C6

Design, fabricate and furnish all equipment required for a carbon adsorption system to meet the requirements set forth herein. This unit shall be a complete, skid-mounted, rental package.

### I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the execution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:
 

Mr. Joseph Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468
- E. All equipment covered by this requisition will be located indoors.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and labeled at a single panel per skid; and all electrical interconnections installed, terminated and labeled at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Items which cannot be shipped as an assembly must be tagged and identified to facilitate field installation.
- G. Equipment shall receive the following tests before shipment:
  1. Certified hydrostatic test of individual vessels.
  2. Hydrostatic test of assembled skids.

FORM NO. 135-901

BY	J. J. K.	P.O. NO.	SUPPLIER
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# REQUISITION

PAGE 2 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942H
--------------	---------------	-------------------------------

### I. GENERAL (cont'd.)

#### G. (cont'd.)

3. Wiring shall be tested and functionally checked. Other tests required by part 16 of Job Spec. 1910-78A4 shall be made.
4. PURCHASER reserves the right to witness any or all tests. Specifics shall be determined later with the vendor.

H. The system of measurement shall be English.

#### J. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with Job Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this requisition is further defined by referenced specifications, standards and drawings. These form an integral part of the work requirements.

1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 8 of this requisition.
2. Other referenced drawings, specifications, standards and publications not listed on Page 8 are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

#### B. Codes

1. All equipment and/or material shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

- A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.
- B. The following equipment and services will be provided by others:
1. Carbon column feed pumps.
  2. Backwash water pump.
  3. Foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
  4. Installation and erection of all equipment and piping.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 8

CHANGE NO. 2      DATE 6 Feb 81      REQUISITION NO. 27-1910-1942 H

### III. SCOPE OF WORK (cont'd)

#### B. (cont'd)

5. Interconnecting piping between individual equipment skids.
6. Interconnections, pneumatic and electrical, between equipment skids and remote control panel.
7. Tracing and insulation for piping and equipment; however, insulation supports rings or studs which are required on vessels shall be furnished by the vendor.
8. Sumps and sewers.
9. Lighting.

#### C. The following equipment and services shall be provided by the vendor:

1. The carbon adsorption system to be supplied by the vendor shall be a complete rental unit and shall include but not necessarily be limited to the following equipment:
  - Two carbon adsorption columns and internals
  - All integral piping and wiring
  - Pressure relief valves
2. Full carbon charge for adsorbers.
3. Provisions for removing spent carbon and installing fresh carbon. Regeneration of carbon to be done at vendor's own facilities.

#### D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items:
  - a. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - b. Sensors (thermocouples, temperature and pressure switches, transmitters, alarm switches, etc.)
  - c. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.,)
2. The following items will be provided by the Purchaser:
  - a. Electronic controllers
  - b. Indicators

FORM NO. 135-802



# REQUISITION

PAGE 4 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 6 Feb 81	REQUISITION NO. 27-1910-1942H
--------------	---------------	-------------------------------

### III. SCOPE OF WORK (cont'd)

#### D. Scope of Instrumentation (cont'd)

- 2. (cont'd)
  - c. Alarms
  - d. Programmable controller digital logic
- 3. Instrument tag numbers will be provided by Purchaser and are to be used on vendor drawings to identify instrument locations and connections.
- 4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
- 5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
- 6. For standardization of instrumentation throughout the plant, items furnished by the Vendor shall comply with Attachment I.

### IV. DESIGN DATA

- A. The carbon adsorption system shall be designed to treat a coal gasification wastewater stream. Influent water will be pretreated to remove oil and solids as well as being biologically treated to remove organics.

#### Influent

Flow - Design: 225 GPM

Normal: 139 GPM

Pressure: 50 PSIG

(Vendor to confirm suitability of this pressure)

Temperature: 100 (Max.) °F

	<u>Influent (mg/l)</u>		<u>Effluent (mg/l)</u>	
	<u>Normal</u>	<u>Max.</u>	<u>Normal</u>	<u>Max.</u>
TOC:	207	425	57	120
TSS:	<5	10	<5	5
COD:	483	1000	124	250
BOD <sub>5</sub> :	56	120	17	40
NH <sub>3</sub> :	20	45	20	40

FORM NO. 135-803



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 8

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942H
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#### IV. DESIGN DATA (cont'd)

##### A. (cont'd)

	<u>Normal</u>	<u>Max.</u>	<u>Normal</u>	<u>Max.</u>
CN:	20	45	20	45
SCN:	100	200	100	200
Oil:	< 5	5	5	5
Phenolics:	18	45	1	1

Note: Compositions shown are based on incomplete pilot plant data and assumed pretreatment removals and are, therefore, subject to change under actual operations. Effluent data is minimum acceptable. Vendor shall provide an estimated effluent quality from his system.

##### B. Utilities

###### 1. Electrical Equipment Utilization Voltage

Instruments 115v/1Phase/60Hz:  
 Motors less than 1/2 HP 115v/1Phase/60Hz  
 Motors 1/2-200 HP 460v/3Phase/60Hz:

Area classification: Non-Hazardous (Unclassified)

###### 2. Air - Plant and instrument air supplied at 100 psig, 100°F.

##### C. Site Data

- Elevation above sea level (ft) 1050 approx.
- Winter design temperature (°F) - 10
- Summer ambient temperature (°F) 92 (Max.)

#### V. EQUIPMENT DESIGN AND CONSTRUCTION

- The carbon adsorption system shall consist of two (2) adsorption columns.
- All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standard practice.
- Clear spacing between adjacent units on a skid shall be a minimum of 12 inches.
- Piping for each skid shall be manifolded to yield single flanged connections for each inlet or outlet service for the skid.

FORM NO. 135-903

# REQUISITION



PAGE 6 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2

DATE 6 Feb 81

REQUISITION NO.

27-1910-1942H

### V. EQUIPMENT DESIGN AND CONSTRUCTION (cont'd.)

#### E. Carbon Adsorbers

1. The automatic backwash system shall be designed to backwash an adsorption column when the maximum pressure drop across the adsorber exceeds a predetermined value. Vendor to advise this pressure drop.
2. Backwash water will be treated water supplied at 50 psig.
3. The adsorption columns shall be welded steel construction designed in accordance with Job Specification 1910-10A1 Welded Unfired Pressure Vessels. Design pressure shall be at least 80 psig, design temperature shall be at least 100°F. These vessels shall be lined, if necessary, vendor to advise.
4. One relief valve shall be provided by the vendor on each column.
5. Individual automatic control valves shall be provided rather than multiport valves.
6. Piping shall be arranged to allow either adsorber as the first stage with the other as the second stage and to allow one to operate while the other is on backwash.

#### F. Instrumentation/Control System

1. The system and components shall be in accordance with Job Specifications 1910-60A1, Instrumentation and 1910-78A4, Electrical Requirements for Packaged Systems.
2. Instrumentation supply shall be as defined in Paragraph III.D.

### VI. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- A. Details for entire cycle consisting of run and backwash.
- B. Piping and instrument diagram showing vessels, piping and controls. This diagram shall clearly indicate the vendor's scope of supply.
- C. An itemized descriptive list of equipment, valves, piping and controls, including electrical items such as starters, relays, etc.
- D. Manufacturer, type, description, capacity and volumes of activated carbon.
- E. Waste water flow, temperature and chemical composition of impurities from carbon adsorbers.

FORM NO. 135-902



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 7 OF 8

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942H
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VI. VENDORS'S BID INFORMATION (cont'd)

- F. Steam, electricity, plant and instrument air requirements for each skid.
- G. Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- H. An itemized list of exceptions to this requisition.
- J. The following equipment data shall be completed and returned with the Vendor's proposal.

1. Carbon Columns

Number of units	_____
Dimensions	_____
Shell material	_____
Plate thickness	_____
Design Pressure	_____
Design Temperature	_____
Filter media	_____
Bed Depth	_____
Bed volume	_____
Nozzles (Sizes and Rating)	_____
Inlet	_____
Outlet	_____
Drain	_____
Backwash Inlet	_____
Backwash Outlet	_____
Vent	_____
Lining material/thickness	_____
Backwash rate, GPM/FT <sup>2</sup>	_____
Length of backwash	_____
Volume of backwash	_____
Differential pressure accross unit (Norm/Max.)	_____
Operating weight	_____
Shipping weight	_____
Skid size/number	_____
Adsorption mode	<input type="checkbox"/> Upflow <input type="checkbox"/> Downflow
Contact Time	_____
Hydraulic loading, GPM/FT <sup>2</sup>	_____
Pressure relief valve size	_____

FORM NO. 135-903

# REQUISITION



PAGE 8 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb 81	REQUISITION NO.	27-1910-1942H
------------	---	------	----------	-----------------	---------------

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

1910-1900A	General Notes for Miscellaneous Equipment
1910-10A1	Welded Unfired Pressure Vessels
1910-38A6	Low Voltage NEMA Frame TEFC and XP Induction Motors
1910-50A1	Piping
1910-52C1	Shop and Field Fabricated Piping
1910-60A1	Instrumentation
1910-78A3	Electrical Heat Tracing
1910-78A4	Electrical Requirements for Packaged Systems
1910-83A1	Painting
1910-88C1	Welding Requirements for Equipment and Piping
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

FORM NO. 135-903



## FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1942H

### INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

#### Control Valves

##### Air Operated

Masoneilan, Fisher Controls, Jamesbury

##### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

#### Flow

##### Flow Switches

Barton, Magnetrol, Peeco

##### Flow Glasses

Brooks, Fischer & Porter, Jergusen

#### Pressure

##### Transmitters

Foxboro, Taylor, Rosemount

##### Relief Valves

Consolidated, Crosby Valve & Gauge, Farris Engineering

##### Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

##### Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge

##### Pressure Differential (for filters)

Orange Research, Meriam, Midwest Instruments





# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 8

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.		DATE
SITE	Noble County, Ohio	ITEM NO. A-2706	27-1910-1942 J		24 July 80
MATERIAL	BELT FILTER PRESS		C1	24 Sep 80	C4
OR			C2	6 Feb. 81	C5
SERVICE			C3		C6

Design, fabricate and furnish all equipment required for a belt filter press type sludge dewatering package system to meet the requirements set forth herein.

### I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

Mr. Joseph Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468

- E. All equipment covered by this requisition will be located indoors as required for weather protection.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and labeled at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-901

BY	J. J. K.	P.O. NO.	SUPPLIER
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# REQUISITION

PAGE 2 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942J
------------	---	------	-----------	-----------------	---------------

I. GENERAL (cont'd.)

G. Equipment shall receive the following tests before shipment:

1. Hydrostatic test of individual vessels certified.
2. Hydrostatic test of assembled skids.
3. Functional electrical test of the controls.
4. Manufacturer's standard operating tests.
5. All wiring shall be tested and functionally checked. Other tests required by part 16 of Job Spec. 1910-78A4 shall be made also.
6. Purchaser reserves the right to witness any or all tests. Specifics shall be determined with the vendor later.

H. The system of measurement shall be English.

J. Schedule of Materials Shipment:

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with Job Specification, 1910-97A1.

II. CODES, RULES, SPECIFICATIONS, AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 7 of this Requisition.
2. Codes

All equipment and/or material shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 8

CHANGE NO. 2

DATE 6 Feb. 81

REQUISITION NO. 27-1910-1942 J

### III. SCOPE OF WORK (cont'd)

B. The following equipment and services will be provided by others:

1. Electrical power, motor starters, cable
2. Installation and erection of all equipment and piping
3. Lighting
4. Foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply
5. Interconnecting piping between individual equipment skids
6. Interconnections, pneumatic and electrical, between the equipment skids
7. Sumps, sewers, and concrete basins
8. The purchaser shall furnish: sludge dewatering feed pumps and a polymer feed metering pump

C. The following equipment and services shall be provided by the vendor:

1. Coagulation tank for polymer mixing
2. A belt filter press dewatering device
3. All pipes, valves and appurtenances to allow efficient and reliable operation at all times.

D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items:
  - a. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - b. Sensors (thermocouples, temperature and pressure switches, transmitters, alarm switches, etc.).
  - c. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).

# REQUISITION



PAGE 4 OF 8

FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2

DATE 6 Feb. 81

REQUISITION NO. 27-1910-1942 J

### III. SCOPE OF WORK (cont'd)

- D. 2. The following items will be provided by the purchaser:
- a. Electronic controllers
  - b. Indicators
  - c. Alarms
  - d. Programmable controller digital logic
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

### IV. DESIGN DATA

The system is to dewater a mixture of sludges that come from a coal gasification waste water treatment plant. The system shall meet and fulfill the following data requirements.

- A. Design Flowrate: 25 gpm of sludge
- B. Sludge fed to the system shall be a mixture of the following:
1. API separator sludge: approximately 2% solids concentration (avg. production 0.3 GPM).
  2. Dissolved air flotation froth/sludge: approximately 1.5% solids concentration (avg. production 1.25 GPM).
  3. Aerobically digested waste biological sludge (with powdered carbon addition): approximately 4% solids concentration (avg. production 1.3 GPM).
- C. Required sludge consistency: 30% dry solids (min.).
- D. Polymer shall be added at a rate not to exceed 15#/Ton of dry solids. Vendor shall advise addition rate.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 8

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942 J

## IV. DESIGN DATA (cont'd)

### E. Utilities

#### 1. Electrical Equipment Utilization Voltage

Instruments                    115v/1Phase/60Hz:  
Motors Less than  $\frac{1}{2}$  HP    115v/1Phase/60Hz:  
Motors  $\frac{1}{2}$  - 200 HP            460v/3Phase/60Hz:

Area classification: Non-Hazardous (Unclassified)

#### 2. Air - Plant and instrument air at 100 psig, 100°F.

#### 3. Service water-available at 75 psig, 70°F.

## V. EQUIPMENT DESIGN AND CONSTRUCTION

A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standard practice.

B. Clear spacing between adjacent units on a skid shall be a minimum of 12 inches.

C. Piping for each skid shall be manifold to yield single flanged connection for each inlet or outlet service for the skid.

### D. Belt Filter Press

The belt filter press shall be designed to produce the required amount and quality of sludge cake as stated in IV C of this requisition.

### E. Coagulation Tank

The vendor shall state the type of polymer, the expected dosage and the feed rate required to produce the specified cake consistency.

### F. Instruments

All instruments shall be in accordance with Job Specification 1910-60A1. See paragraph III.D. for scope of instrumentation.

### G. Electrical

Electrical components furnished by the vendor shall be in accord with Job Specification 1910-78A4, Electrical Requirements for Packaged Systems.

H. Integral variable speed drive system shall be provided by the supplier. The speed variation shall be made mechanically.



# REQUISITION

PAGE 6 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942 J
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### VI. GUARANTEE

- A. The vendor shall guarantee that the sludge dewatering system, when installed and operated in accordance with his instruction, will be capable of producing the quoted quantities of sludge cake at the quality specified.
- B. For mechanical guarantee, see inquiry documents.

### VII. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a. Piping and instrument diagram showing vessels, piping, equipment, and controls. This diagram shall clearly indicate the vendor's scope of supply.
- b. An itemized descriptive list of equipment, valves, piping and controls.
- c. Tabulation of all utility requirements for each skid.
- d. Extent of skid mounting giving the number and dimensions of skids, weights of skids, and number, size and type of piping connections.
- e. An itemized list of exceptions to this requisition.
- f. The following equipment data shall be completed and returned with the vendor's approval.

1) Belt Filter Press:

Dimensions: \_\_\_\_\_  
 Weights: Shipping \_\_\_\_\_ Operating \_\_\_\_\_ Flooded \_\_\_\_\_  
 Materials: \_\_\_\_\_  
 Number of skids each: \_\_\_\_\_  
 Sludge feedrate: \_\_\_\_\_  
 Cake consistency (final): \_\_\_\_\_  
 Electrical required: \_\_\_\_\_ v/ \_\_\_\_\_ Ph/ \_\_\_\_\_ Hz  
 Water flowrate: \_\_\_\_\_  
 Type of drive system: \_\_\_\_\_  
 Speed range: \_\_\_\_\_  
 Type of controls: \_\_\_\_\_

FORM NO. 135-803



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 8

CHANGE NO. 2	DATE 6 Feb. 81	REQUISITION NO. 27-1910-1942-J
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### VII. VENDOR'S BID INFORMATION

f. 2) Coagulation Tank:

Dimensions: \_\_\_\_\_  
 Weights: \_\_\_\_\_  
 Materials: \_\_\_\_\_  
 Polymer feedrate: \_\_\_\_\_  
 Electrical required: \_\_\_\_\_ v/ \_\_\_\_\_ Ph/ \_\_\_\_\_ Hz \_\_\_\_\_  
 Type of drive system: \_\_\_\_\_  
 Type of control: \_\_\_\_\_  
 H.P. and speed of mixer \_\_\_\_\_

3) Motors - See data sheet page 8.

### VIII. REFERENCED DOCUMENTS

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

1910-1900A	General Notes for Miscellaneous Equipment
1910-38A6	Low Voltage NEMA Frame TEFC and XP Induction Motors
1910-50A21.040	Piping Material Spec. "Lc"
1910-50A2	Gaskets & Surface Finish for Bolted Flanged Joints
1910-52C1	Shop & Field Fabricated Pipe
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Systems
1910-83A1	Painting
1910-88C1	Welding Requirements for Equipment and Piping
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

FORM NO. 135-802

FORM 135-49

F.W.C. CONTRACT <u>15-1910</u> FOR: <u>CONOCO/DOE</u> SITE: <u>NOBLE COUNTY, OHIO</u> MANUFACTURER: _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">REQUISITION NUMBER</td> <td style="width: 50%;">DATE</td> </tr> <tr> <td><u>27-1910-1942J</u></td> <td><u>24 July 80</u></td> </tr> <tr> <td colspan="2">SUPERSEDED BY CHANGE NO.:</td> </tr> <tr> <td><u>C1 24 Sep 80</u></td> <td><u>C3</u></td> </tr> <tr> <td><u>C2 6 Feb 81</u></td> <td><u>C4</u></td> </tr> <tr> <td></td> <td><u>C5</u></td> </tr> <tr> <td></td> <td><u>C6</u></td> </tr> </table>	REQUISITION NUMBER	DATE	<u>27-1910-1942J</u>	<u>24 July 80</u>	SUPERSEDED BY CHANGE NO.:		<u>C1 24 Sep 80</u>	<u>C3</u>	<u>C2 6 Feb 81</u>	<u>C4</u>		<u>C5</u>		<u>C6</u>
REQUISITION NUMBER	DATE														
<u>27-1910-1942J</u>	<u>24 July 80</u>														
SUPERSEDED BY CHANGE NO.:															
<u>C1 24 Sep 80</u>	<u>C3</u>														
<u>C2 6 Feb 81</u>	<u>C4</u>														
	<u>C5</u>														
	<u>C6</u>														

<b>APPLICABLE DOCUMENTS:</b> MOTOR SPECIFICATION <u>1910-38A6</u> PREP. FOR SHIPMENT <u>1910-97A1</u> GENERAL NOTES _____	<b>SITE DATA:</b> ALTITUDE <u>1050</u> FT. (APP) BAROMETER <u>14.2</u> PSIA AMBIENT _____ °F. MAX. TO _____ °F. MIN. ATMOSPHERE _____ INSTALLED <input checked="" type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR <input type="checkbox"/> AREA <input type="checkbox"/> CL. <input type="checkbox"/> -GR. <input type="checkbox"/> -DIV. <input checked="" type="checkbox"/> NON-HAZARDOUS.
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ITEM NUMBERS:						
TOTAL QUANTITY						
DRIVEN EQUIPMENT						
HP NAMEPLATE RATING						
SERVICE FACTOR						
RPM AT FULL LOAD/ NO. POLES	/ /	/ /	/ /	/ /	/ /	/ /
VOLTS/PHASES/HERTZ	/ / /	/ / /	/ / /	/ / /	/ / /	/ / /
ENCLOSURE						
°C. RISE AT FULL S.F. LOAD						
TEMP. MEASUREMENT METHOD						
INSULATION CLASS						
INSUL. SPECIAL TREATMENT						
SPECIAL HARDWARE						
FRAME NUMBER						
MOUNTING ASSEMBLY NUMBER						
ROTATE FROM END OPP. CPLG.						
BEARINGS TYPE						
LUBRICATION						
END FLOAT (IF APPL.) INS.						
N.E.M.A. DESIGN LETTER						
AMPS.: F.L./LOCKED ROTOR	/ /	/ /	/ /	/ /	/ /	/ /
LOCKED ROTOR LIMIT, SECS.						
EFFIC. 100%/75%/50% LOAD	/ / /	/ / /	/ / /	/ / /	/ / /	/ / /
% P.F. 100%/75%/50% LOAD	/ / /	/ / /	/ / /	/ / /	/ / /	/ / /
<b>ACCESSORIES:</b>						
SPACE HEATERS: BASE WATTS						
VOLTS/PH/Hz	/ / /	/ / /	/ / /	/ / /	/ / /	/ / /
TEMP. DETECTORS: NUMBER TYPE						
AIR FILTERS						
MOUNTING COUPLING HALF						
<b>TESTS:</b> (W = WITNESSED)						
N.E.M.A. STD. COMMERCIAL						
<b>TEST CERTIFICATES REQ'D.</b>						
<b>WEIGHTS:</b> (LBS)						
NET/GROSS	/ /	/ /	/ /	/ /	/ /	/ /
MAX. NORMAL MAINTENANCE						





# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1942-J

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

### Flow

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Flow Glasses

Brooks, Fisher & Porter, Jergusen

### Level

#### Gauge Glasses

Daniel Industries, Jurguson Valve & Gauge, Penberthy Houdaille

### Pressure

#### Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

#### Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

Section 2700  
Wastewater Treatment

PAGE 1 OF 4

CLIENT <u>Conoco/DOE</u>	CONTRACT NO. <u>15-1910</u>	REQUISITION NO.	DATE
SITE <u>Noble County, Ohio</u>	ITEM NO. <u>A-2715</u>	<u>27-1910-1942-K</u>	<u>Jul 31, 80</u>
MATERIAL <u>Clean Basin Floating Skimmer</u>		C1 9 Sept. 80	C4
OR		C2 10 Feb. 81	C5
SERVICE		C3	C6

Design, fabricate, and furnish all equipment required for one (1) floating skimmer to meet the requirements set forth herein.

### I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

Mr. J. J. Kunyz  
 Foster Wheeler Energy Corporation  
 110 South Orange Avenue  
 Livingston, NJ 07039  
 Telephone: (201) 533-2468

- E. All equipment covered by this requisition will be located outdoors.
- F. Equipment shall receive the manufacturer's standard tests before shipment.
- G. The system of measurement shall be in English.
- H. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Material shall be prepared for shipment in accordance with Job Specification 1910-97A1.

FORM NO. 135-801

BY <u>J. J. Kunyz</u>	P.O. NO.	SUPPLIER
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# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 4

CHANGE NO. 2

DATE 10 Feb. 81

REQUISITION NO. 27-1910-1942-K

## II. CODES, RULES, SPECIFICATIONS AND STANDARDS

- A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements. These specifications are:

1910-38A6 - Low Voltage NEMA Frame TEFC and XP Induction Motors  
1910-50A2 - Gaskets & Surface Finish for Bolted Flanged Joints  
1910-78A4 - Electrical Requirements for Packaged Systems  
1910-95A2 - Noise Control - Equipment  
1910-97A1 - Preparation of Materials for Shipment  
1910-1900A - General Notes for Miscellaneous Equipment

### B. Codes

All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

## III. SCOPE OF WORK/DESIGN DATA

- A. The vendor shall quote on the base equipment outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base equipment and clearly identify these advantages in his proposal.
- B. Installation, piping, wiring, etc., shall be by PURCHASER.
- C. The vendor's scope of supply shall include, but not necessarily be limited to, the following:
- adjustable, floating oil skimmer with oil sump, pump, motor.
  - hose floats, 20' of discharge hose, oil resistant electrical cord.
- D. Skimmer shall be installed in the clean stormwater basin. Capacity of basin is 2,500,000 gallons.

## IV. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2	DATE 10 Feb. 81	REQUISITION NO. 27-1910-1942-K
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### IV. VENDOR'S BID INFORMATION (CONT'D)

- a) Piping and instrument diagram showing vessels, pumps, piping and controls. This diagram shall clearly indicate the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) The following equipment data shall be completed and returned with the vendor's proposal.

1. Oil recovery mechanism

Type \_\_\_\_\_

Capacity \_\_\_\_\_

Material \_\_\_\_\_

2. Floats

Size \_\_\_\_\_

Material \_\_\_\_\_

Filling (if any) \_\_\_\_\_

3. Oil Pump

Type \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model \_\_\_\_\_

Flow, GPM \_\_\_\_\_

Discharge Pressure, psig \_\_\_\_\_

Material \_\_\_\_\_

Speed, RPM \_\_\_\_\_

Brake Horsepower \_\_\_\_\_

4. Motors - See data sheet Page 4.

FORM NO. 135-902



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 4 OF 4

CLIENT <b>CONOCO / DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY OHIO</b>				<b>27-1910-1942 K</b>		<b>JUL. 31, 80</b>	
MATERIAL <b>SQUIRREL CAGE INDUCTION MOTOR(S),</b>				<b>C1 9 SEP 80</b>		<b>C4</b>	
<input type="checkbox"/> HORIZONTAL <input type="checkbox"/> VERTICAL				<b>C2 10 FEB 81</b>		<b>C5</b>	
MANUFACTURER				<b>C3</b>		<b>C6</b>	
1	ITEM(S):						
2							
3	QUANTITY						
4	DRIVEN EQUIPMENT						
5	NAMEPLATE HP						
6	SERVICE FACTOR						
7							
8	FL RPM/NO. OF POLES	/	/	/	/	/	/
9	VOLTS/PH/HZ	//	//	//	//	//	//
10	ENCLOSURE TYPE						
11	°C RISE/40°C @ SF LOAD						
12	TEMP. MEASUREMENT METHOD						
13	INSULATION CLASS						
14	THERMAL PROTECTOR TYPE						
15	NEC TEMP. IDENT. NO.						
16	FRAME SIZE NO.						
17	MOUNTING ASSEMBLY						
18	ROTATION FROM END OPP.CPLG.						
19	BEARINGS TYPE						
20	LUBRICATION						
21	NEMA LR CODE						
22	NEMA DESIGN						
23	AMPS., FL/LR	/	/	/	/	/	/
24	LOCKED ROTOR LIMIT, SECS.						
25	% EFFIC. 100%/75%/50% LOAD	/	/	/	/	/	/
26	% P.F. 100%/75%/50% LOAD	/	/	/	/	/	/
27	NOISE LEVEL (dBA @ 3 FT)						
28	SPECIAL REQUIREMENTS:						
29	MOUNT HALF-COUPLING						
30	SPACE HEATERS WATTS						
31	VOLTS/PH/HZ	//	//	//	//	//	//
32	SUITABLE FOR V-BELT DRIVE						
33	SLIDE BASE						
34							
35	WEIGHT:						
36	MOTOR & (IF APPLIC.) BASE						
37	TESTS:						
38	N.E.M.A. STD. COMMERCIAL						
39							
40	TEST CERTIFICATES REQUIRED						
41	NOTES:						
42							
43							
44							
45	APPLICABLE DOCUMENTS: <b>(PER Pg. 2)</b>	BASIC DESIGN DATA:					
46	MOTOR SPECIFICATION -38A6	ALTITUDE <b>1060 FT.</b>					
47		AMBIENT <b>92 °F MAX. -10 °F MIN.</b>					
48		INSTALLATION <input type="checkbox"/> INDOOR <input checked="" type="checkbox"/> OUTDOOR <input type="checkbox"/>					
49	PREP. FOR SHIP'T. SPEC. -97A1	ELEC. AREA <input type="checkbox"/> CL. <input type="checkbox"/> GRP(S). <input type="checkbox"/> DIV.					
50	GENFRAL NOTES REQ'N. -1300A	<input checked="" type="checkbox"/> NON- HAZARDOUS					
51							
BY <b>J. J. K.</b>		P. O.		VENDOR			

FORM NO. 135-323B



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 9

CLIENT	CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.		DATE.
SITE	Noble County, Ohio	ITEM NO.	27-1910-1942N		29Aug. 80
MATERIAL	A-2716 Belt Filter Press Polymer Feed		C1	1Dec.80	C4
OR	A-2717 DAF Polymer Feed		C2	6 Feb. 81	C5
SERVICE	A-2719 Filtration Polymer Feed		C3		C6

Design, fabricate, and furnish all equipment for three (3) polymer feed systems to meet the requirements set forth herein.

### I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

Mr. Joseph Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, NJ 07039

Telephone: (201) 533-2468

- E. All equipment covered by this requisition will be located indoors.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and labeled at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.
- G. Equipment shall receive the manufacturer's standard tests before shipment. Electrical tests shall be made in accordance with Job Specification 1910-78A4.

FORM NO. 135-801

BY	JJK	P.O. NO.	SUPPLIER
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# REQUISITION

PAGE 2 OF 9

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb. 61	REQUISITION NO.	27-1910-1942N
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### I. GENERAL (cont'd.)

H. The system of measurement shall be English.

#### J. Schedule of Materials Shipment:

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with Job Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS, AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards and drawings. These form an integral part of the work requirements.

1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 6 of this requisition.

#### 2. Codes

All equipment and/or material shall be in accordance with all Governmental and local codes, laws, rules, and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

B. The following equipment and services will be provided by others:

1. One 480 volt, 3 phase, electrical power supply to each skid for power. One 120 volt, 1 phase, electrical power supply to each skid for instrumentation.
2. Installation and erection of all equipment and piping.
3. Lighting.
4. Foundations and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
5. Interconnecting piping between individual equipment skids.

FORM NO. 135-808



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 9

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942N

III. SCOPE OF WORK (cont'd.)

B. (cont'd.)

6. Interconnections, pneumatic and electrical, between the equipment skids.
7. Sumps, sewers, and concrete basins.

C. The following equipment and services shall be provided by the vendor:

1. Each polymer feed system shall include, but not necessarily be limited to, the following:

-Tank for mixing of liquid or dry polymer.

-Mixer installed in tank.

-Polymer feed pump.

-Local instrumentation including pressure gages and flow indicators.

-Local controls for polymer and water.

-All skid mounted piping.

-One spare pump, shipped loose, to be kept as a warehouse spare.

-All skid wiring with interconnections and external wiring, such as alarms and remote shutdowns, shall be taken to a terminal box for continuation by purchaser.

D. Scope of Instrumentation

1. The vendor shall supply the following instruments items:

a. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).

b. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).

c. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).

FORM NO. 135-902





# REQUISITION

PAGE 4 OF 9

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942N

### III. SCOPE OF WORK (cont'd.)

#### D. (cont'd.)

2. The following items will be provided by the Purchaser:
  - a. Electronic controllers.
  - b. Indicators.
  - c. Alarms.
  - d. Programmable controller digital logic.
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
5. For standardization of instrumentation throughout the plant items furnished by the vendor shall comply with Attachment I.

### IV. DESIGN DATA

A. Each system shall be designed to provide a controlled flow of polymer. Specific data for each service is given on pages 7, 8, and 9 of this requisition. Each system shall take undiluted liquid polymer or dry polymer and thoroughly mix this polymer with dilution water prior to addition to downstream equipment.

#### B. Utilities

##### 1. Electrical Equipment Utilization Voltage

Instruments	115v/1Phase/60Hz
Motors Less than ½ HP	115v/1Phase/60Hz
Motors ½ - 200 HP	460v/3Phase/60Hz

Area classification: Non-Hazardous

2. Air - Plant and instrument air at 100 psig, 100°F.
3. Dilution water - available at 75 psig, 70°F.

FORM NO. 135-803



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 9

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942N

IV. DESIGN DATA (cont'd.)

C. Site Data

1. Elevation above sea level (ft) 1050 (approx.)
2. Winter design temperature (°F) -10
3. Summer ambient temperature (°F) 92 (Max.)

V. EQUIPMENT DESIGN AND CONSTRUCTION

A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA, and other governing codes or standards practice.

B. Motors shall be in accordance with Job Specification 1910-38A6, Low Voltage NEMA Frame TEFC, and XP Induction Motors.

C. Instruments

All instruments shall be in accordance with Job Specification 1910-60A1. See Paragraph III.D. for scope of instrumentation.

D. Electrical

Electrical components furnished by the vendor shall be in accordance with Job Specification 1910-78A4, Electrical Requirements for packaged Systems.

VI. GUARANTEE

The vendor shall guarantee that the feed systems when installed and operated in accordance with his instructions, shall meet the requirements of this requisition.

VII. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram clearly indicating the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.

FORM NO. 135-902



# REQUISITION

PAGE 6 OF 9

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942N
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### VII. VENDOR'S BID INFORMATION (cont'd.)

- c) Electricity, plant and instrument air, and water requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.
- f) Complete listing of materials of construction for all items.
- g) Vendor shall complete all data on attached data sheets, pages 7, 8, and 9.

### VIII. REFERENCES

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with these referenced documents.

#### SPEC. NUMBER

#### TITLE

1910-38A6	Low Voltage NEMA Frame TEFC & XP Induction Motors
1910-50A1	Piping
1910-50A2	Gaskets & Surface Finish for Bolted Flanged Joints
1910-60A1	Instrumentation
1910-78A4	Electrical Requirements for Packaged Systems
1910-83A1	Painting
1910-88C1	Welding Requirements
1910-95A2	Equipment Noise Control
1910-97A1	Preparation of Material for Shipment

#### REQUISITION NUMBER

1910-1900A	General Notes for Miscellaneous Equipment
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FORM NO. 135-903



FOR CONOCO/DOE F.W. CONTRACT 15-1910  
 SITE NORLE COUNTY, OHIO  
 ITEM NO. A-2716 SERVICE BELT FILTER PRESS  
 MFR. \_\_\_\_\_ MODEL \_\_\_\_\_ NO. REQ'D. ONE

REQUISITION NUMBER	DATE
<u>27-1910-1942N</u>	<u>29 AUG. 83</u>
SUPERSEDED BY CHANGE NO.:	
C1 <u>DEC. 80</u>	C3 _____
C2 <u>6Feb81</u>	C4 _____
	C5 _____
	C6 _____

PROCESS REQUIREMENTS:

LIQUID POLYMER  
 TEMP., OF. AMBIENT  
 SP. GR. \_\_\_\_\_  
 NPSHA, FT. \_\_\_\_\_  
 FLOW Max. 15 GPH  
 MIN. \_\_\_\_\_  
 DISCH. PSIG 10  
 SUCT. PSIG 0  
 DIFF. PSI 10  
 MIN. REQ'D CONTROL \_\_\_\_\_

PUMP DRIVER: (BY PUMP MFR.)

MOTOR:  
 MFR. \_\_\_\_\_  
 HP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 SERVICE FACTOR 1.15  
 V./PH./HZ. 115/1/60  
 ENCLOSURE \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 FRAME NO. \_\_\_\_\_  
 F.L. AMPS \_\_\_\_\_  
 L.R. AMPS \_\_\_\_\_  
 INSUL. CLASS \_\_\_\_\_  
 OC. RISE \_\_\_\_\_

PACKAGE UNIT:  REQ'D.  NONE

TANK (WITH LEGS & PUMP PLATFORM):  
 U.S. GAL. CAPACITY 300  
 MATERIAL \_\_\_\_\_  
 TYPE COVER \_\_\_\_\_  
 TYPE BOTTOM \_\_\_\_\_  
 MIXER BRACKET \_\_\_\_\_  
 DIA. X HEIGHT \_\_\_\_\_  
 TOTAL UNIT HEIGHT \_\_\_\_\_  
 FILL CONN. #1 \_\_\_\_\_  
 FILL CONN. #2 \_\_\_\_\_  
 OVERFLOW CONN. REQ'D  
 DRAIN CONN. REQ'D  
 DRAIN PLUG \_\_\_\_\_  
 DRAIN VALVE \_\_\_\_\_  
 GAGE GL. CONNS. \_\_\_\_\_  
 GAGE & COCKS REQ'D  
 HEATER No

PUMP DATA:

NO. OF HEADS Two (Note.1)  
 PLUNGER DIA. \_\_\_\_\_  
 MAX. STROKE \_\_\_\_\_  
 RPM \_\_\_\_\_  
 U.S.GPH MAX. 15.0  
 MIN. \_\_\_\_\_  
 MAX. WORK. PSIG \_\_\_\_\_  
 HYDROTEST PSIG \_\_\_\_\_  
 PSV SET. PSIG \_\_\_\_\_  
 NPSHR FT. \_\_\_\_\_  
 MAX. TEMP. OF \_\_\_\_\_  
 NET BHP REQ'D \_\_\_\_\_  
 CONTROL METHOD While pump is running - manual  
 CHECKS: TYPE \_\_\_\_\_  
 NO. PER VALVE \_\_\_\_\_  
 PACKING TYPE \_\_\_\_\_  
 SUCTION: SIZE 150#  
 RATING \_\_\_\_\_  
 DISCH.: SIZE \_\_\_\_\_  
 RATING 150#

GEAR:

MFR. \_\_\_\_\_  
 RATED BHP \_\_\_\_\_  
 SERVICE FACTOR \_\_\_\_\_  
 TYPE \_\_\_\_\_

COUPLING:

MFR. \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 MODEL \_\_\_\_\_

GUARDS:

COUPLINGS \_\_\_\_\_  
 MOVEMENTS \_\_\_\_\_  
 MAT'L. \_\_\_\_\_  
 (GUARD REQ'D. FOR ALL EXPOSED MOVING PARTS AND COUPLINGS)

PIPING SYSTEMS:

MATERIAL \_\_\_\_\_  
 SIZE/RATING: \_\_\_\_\_  
 SUCT. PIPE \_\_\_\_\_  
 DISCH. PIPE \_\_\_\_\_  
 PSV DISCH. PIPE \_\_\_\_\_  
 PSV \_\_\_\_\_  
 SUCT. STRAINER \_\_\_\_\_  
 SUCT. DRAIN \_\_\_\_\_  
 SUCT. BLOCK VALVE \_\_\_\_\_  
 DISCH. BLOCK VALVE \_\_\_\_\_

DISSOLVING BASKET:  YES  NO

MATERIAL \_\_\_\_\_

PUMP MATERIALS: C.S.

CYLINDER OR HEAD \_\_\_\_\_  
 PLUNGER \_\_\_\_\_  
 DIAPHRAGM \_\_\_\_\_  
 VALVES: CHECKS \_\_\_\_\_  
 SEATS \_\_\_\_\_  
 BODY \_\_\_\_\_  
 PLUNGER GUIDE \_\_\_\_\_  
 LANTERN RING \_\_\_\_\_  
 GLAND \_\_\_\_\_  
 PACKING \_\_\_\_\_  
 BASEPLATE \_\_\_\_\_  
 HOUSING FRAME \_\_\_\_\_

SHOP TESTS: REQ'D. WITNESS \_\_\_\_\_

HYDROTEST PUMP X \_\_\_\_\_  
 PUMP MECH'L RUN X \_\_\_\_\_  
 PUMP PERFORMANCE \_\_\_\_\_  
 MIXER MECH'L RUN \_\_\_\_\_  
 CHECK CONTROLS X \_\_\_\_\_  
 SET PSV \_\_\_\_\_

MIXER (AGITATOR):  YES  NO

MFR. \_\_\_\_\_  
 MODEL \_\_\_\_\_  
 MOUNT METHOD \_\_\_\_\_  
 SHAFT MATERIAL \_\_\_\_\_  
 IMPELLER MAT'L. \_\_\_\_\_  
 DRIVER:  
 HP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 V./PH./HZ \_\_\_\_\_  
 ENCLOSURE \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 F.L. AMPS \_\_\_\_\_  
 L.R. AMPS \_\_\_\_\_  
 INSUL. CLASS \_\_\_\_\_  
 OC. RISE \_\_\_\_\_

SITE DATA:  INDOOR  OUTDOOR

CL. -GR. -DIV. \_\_\_\_\_  
 NON-HAZARDOUS.  
 AMBIENT \_\_\_\_\_ OF. MAX. & \_\_\_\_\_ OF. MIN.

APPLICABLE DOCUMENTS:

GENERAL NOTES \_\_\_\_\_  
 MOTOR SPEC. \_\_\_\_\_  
 ver \_\_\_\_\_

NOTES:

1) Two pumps with common driver

(1.0)

FOR CONOCO / DOE F.W. CONTRACT 15-1910  
 SITE NOBLE COUNTY, OHIO  
 ITEM NO. A-2717 SERVICE DAF POLYMER FEED  
 MFR. \_\_\_\_\_ MODEL \_\_\_\_\_ NO. REQ'D. ONE \_\_\_\_\_

REQUISITION NUMBER	DATE
27-1910-1942N	29 AUG 80
SUPERSEDED BY CHANGE NO.:	
C1 1 Dec. 80	C3
C2 6 Feb. 80	C6

**PROCESS REQUIREMENTS:**  
 LIQUID POLYMER  
 TEMP., °F. AMBIENT  
 SP. GR. 0.15  
 NPSHA, FT. \_\_\_\_\_  
 FLOW Max. 5.0 gpd  
 MIN. \_\_\_\_\_  
 DISCH. PSIG 30  
 SUCT. PSIG 0  
 DIFF. PSI 30  
 MIN. REQ'D CONTROL \_\_\_\_\_

**PUMP DRIVER: (BY PUMP MFR.)**  
 MOTOR:  
 MFR. \_\_\_\_\_  
 HP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 SERVICE FACTOR 1.15  
 V./PH./HZ. 115/1/60  
 ENCLOSURE \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 FRAME NO. \_\_\_\_\_  
 F.L. AMPS \_\_\_\_\_  
 L.R. AMPS \_\_\_\_\_  
 INSUL. CLASS \_\_\_\_\_  
 °C. RISE \_\_\_\_\_

**PACKAGE UNIT:**  REQ'D.  NONE  
**TANK (WITH LEGS & PUMP PLATFORM):**  
 U.S. GAL. CAPACITY 150  
 MATERIAL \_\_\_\_\_  
 TYPE COVER \_\_\_\_\_  
 TYPE BOTTOM \_\_\_\_\_  
 MIXER BRACKET \_\_\_\_\_  
 DIA. X HEIGHT \_\_\_\_\_  
 TOTAL UNIT HEIGHT \_\_\_\_\_  
 FILL CONN. #1 \_\_\_\_\_  
 FILL CONN. #2 \_\_\_\_\_  
 OVERFLOW CONN. REQ'D.  
 DRAIN CONN. REQ'D.  
 DRAIN PLUG \_\_\_\_\_  
 DRAIN VALVE \_\_\_\_\_  
 GAGE GL. CONNS. \_\_\_\_\_  
 GAGE & COCKS REQ'D.  
 HEATER No  
 LEVEL SWITCH \_\_\_\_\_  
 FLOAT \_\_\_\_\_

**PUMP DATA:**  
 NO. OF HEADS Two (Note 1)  
 PLUNGER DIA. \_\_\_\_\_  
 MAX. STROKE \_\_\_\_\_  
 RPM \_\_\_\_\_  
 U.S. GPM MAX. 5 GPD (Each)  
 MIN. \_\_\_\_\_  
 MAX. WORK. PSIG \_\_\_\_\_  
 HYDROTEST PSIG \_\_\_\_\_  
 PSV SET. PSIG \_\_\_\_\_  
 NPSHR FT. \_\_\_\_\_  
 MAX. TEMP. °F \_\_\_\_\_  
 NET BHP REQ'D \_\_\_\_\_  
 CONTROL METHOD While pump is running - manual  
 CHECKS: TYPE \_\_\_\_\_  
 NO. PER VALVE \_\_\_\_\_  
 PACKING TYPE \_\_\_\_\_  
 SUCTION: SIZE \_\_\_\_\_  
 RATING \_\_\_\_\_  
 DISCH.: SIZE \_\_\_\_\_  
 RATING \_\_\_\_\_

**GEAR:**  
 MFR. \_\_\_\_\_  
 RATED BHP \_\_\_\_\_  
 SERVICE FACTOR \_\_\_\_\_  
 TYPE \_\_\_\_\_  
**COUPLING:**  
 MFR. \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 MODEL \_\_\_\_\_  
**GUARDS:**  
 COUPLINGS \_\_\_\_\_  
 MOVEMENTS \_\_\_\_\_  
 MAT'L. \_\_\_\_\_  
 (GUARD REQ'D. FOR ALL EXPOSED MOVING PARTS AND COUPLINGS)

**PIPING SYSTEMS:**  
 MATERIAL \_\_\_\_\_  
 SIZE/RATING: \_\_\_\_\_  
 SUCT. PIPE \_\_\_\_\_  
 DISCH. PIPE \_\_\_\_\_  
 PSV DISCH. PIPE \_\_\_\_\_  
 PSV \_\_\_\_\_  
 SUCT. STRAINER \_\_\_\_\_  
 SUCT. DRAIN \_\_\_\_\_  
 SUCT. BLOCK VALVE \_\_\_\_\_  
 DISCH. BLOCK VALVE \_\_\_\_\_  
 DISSOLVING BASKET:  YES  NO  
 MATERIAL \_\_\_\_\_

**PUMP MATERIALS:** C.S.  
 CYLINDER OR HEAD \_\_\_\_\_  
 PLUNGER \_\_\_\_\_  
 DIAPHRAGM \_\_\_\_\_  
 VALVES: CHECKS \_\_\_\_\_  
 SEATS \_\_\_\_\_  
 BODY \_\_\_\_\_  
 PLUNGER GUIDE \_\_\_\_\_  
 LANTERN RING \_\_\_\_\_  
 GLAND \_\_\_\_\_  
 PACKING \_\_\_\_\_  
 BASEPLATE \_\_\_\_\_  
 HOUSING FRAME \_\_\_\_\_

**SHOP TESTS:** REQ'D. WITNESS  
 HYDROTEST PUMP X \_\_\_\_\_  
 PUMP MECH'L RUN X \_\_\_\_\_  
 PUMP PERFORMANCE \_\_\_\_\_  
 MIXER MECH'L RUN \_\_\_\_\_  
 CHECK CONTROLS X \_\_\_\_\_  
 SET PSV \_\_\_\_\_  
**SITE DATA:**  INDOOR  OUTDOOR  
 CL.  GR.  DIV. \_\_\_\_\_  
 NON-HAZARDOUS.  
 AMBIENT °F. MAX. & \_\_\_\_\_ °F. MIN.

**MIXER**  YES  NO  
 MFR. \_\_\_\_\_  
 MODEL \_\_\_\_\_  
 MOUNT METHOD \_\_\_\_\_  
 SHAFT MATERIAL \_\_\_\_\_  
 IMPELLER MAT'L. \_\_\_\_\_  
**DRIVER:**  
 HP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 V./PH./HZ \_\_\_\_\_  
 ENCLOSURE \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 F.L. AMPS \_\_\_\_\_  
 L.R. AMPS \_\_\_\_\_  
 INSUL. CLASS \_\_\_\_\_  
 °C. RISE \_\_\_\_\_

**NOTES:**  
 1) Two pumps with common driver

**APPLICABLE DOCUMENTS:**  
 GENERAL NOTES \_\_\_\_\_  
 MOTOR SPEC. \_\_\_\_\_



FOR CONOCO/DOE F.W. CONTRACT 15-1910  
 SITE NOBLE COUNTY, OHIO  
 ITEM NO. A-2719 SERVICE FILTRATION POLYMER FEED  
 MFR. \_\_\_\_\_ MODEL \_\_\_\_\_ NO. REQ'D. ONE

REQUISITION NUMBER	DATE
<u>27-1910-1942N</u>	<u>29 AUG. 80</u>
SUPERSEDED BY CHANGE NO.:	
C1 <u>1 DEC 80</u> C3 _____	C5 _____
C2 <u>6 FEB 81</u> C4 _____	C6 _____

PROCESS REQUIREMENTS:

LIQUID POLYMER  
 TEMP., OF. AMBIENT  
 SP. GR. 0.15  
 NPSHA, FT. \_\_\_\_\_  
 FLOW Max. 5.0 GPD  
 MIN. \_\_\_\_\_  
 DISCH. PSIG 30  
 SUCT. PSIG 0  
 DIFF. PSI 30  
 MIN. REQ'D CONTROL \_\_\_\_\_

PUMP DATA:

NO. OF HEADS \_\_\_\_\_  
 PLUNGER DIA. \_\_\_\_\_  
 MAX. STROKE \_\_\_\_\_  
 RPM \_\_\_\_\_  
 U.S. MAX. 5.0 GPD  
 MIN. \_\_\_\_\_  
 MAX. WORK. PSIG \_\_\_\_\_  
 HYDROTEST PSIG \_\_\_\_\_  
 PSV SET. PSIG \_\_\_\_\_  
 NPSHR FT. \_\_\_\_\_  
 MAX. TEMP. OF \_\_\_\_\_  
 NET BHP REQ'D \_\_\_\_\_  
 CONTROL METHOD Whole pump is running - manual  
 CHECKS: TYPE \_\_\_\_\_  
 NO. PER VALVE \_\_\_\_\_  
 PACKING TYPE \_\_\_\_\_  
 SUCTION: SIZE \_\_\_\_\_  
 RATING \_\_\_\_\_  
 DISCH.: SIZE \_\_\_\_\_  
 RATING \_\_\_\_\_

PUMP DRIVER: (BY PUMP MFR.)

MOTOR:  
 MFR. \_\_\_\_\_  
 HP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 SERVICE FACTOR 1.15  
 V./PH./HZ. 115/1/60  
 ENCLOSURE \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 FRAME NO. \_\_\_\_\_  
 F.L. AMPS \_\_\_\_\_  
 L.R. AMPS \_\_\_\_\_  
 INSUL. CLASS \_\_\_\_\_  
 OC. RISE \_\_\_\_\_

GEAR:

MFR. \_\_\_\_\_  
 RATED BHP \_\_\_\_\_  
 SERVICE FACTOR \_\_\_\_\_  
 TYPE \_\_\_\_\_

COUPLING:

MFR. \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 MODEL \_\_\_\_\_

GUARDS:

COUPLINGS \_\_\_\_\_  
 MOVEMENTS \_\_\_\_\_  
 MAT'L. \_\_\_\_\_  
 (GUARD REQ'D. FOR ALL EXPOSED MOVING PARTS AND COUPLINGS)

PACKAGE UNIT:  REQ'D.  NONE

TANK (WITH LEGS & PUMP PLATFORM):  
 U.S. GAL. CAPACITY 150  
 MATERIAL \_\_\_\_\_  
 TYPE COVER \_\_\_\_\_  
 TYPE BOTTOM \_\_\_\_\_  
 MIXER BRACKET \_\_\_\_\_  
 DIA. X HEIGHT \_\_\_\_\_  
 TOTAL UNIT HEIGHT \_\_\_\_\_  
 FILL CONN. #1 \_\_\_\_\_  
 FILL CONN. #2 \_\_\_\_\_  
 OVERFLOW CONN. REQ'D.  
 DRAIN CONN. REQ'D.  
 DRAIN PLUG \_\_\_\_\_  
 DRAIN VALVE \_\_\_\_\_  
 GAGE GL. CONNS. \_\_\_\_\_  
 GAGE & COCKS REQ'D.  
 HEATER \_\_\_\_\_  
 LEVEL SWITCH \_\_\_\_\_  
 FLOAT \_\_\_\_\_

PIPING SYSTEMS:

MATERIAL \_\_\_\_\_  
 SIZE/RATING: \_\_\_\_\_  
 SUCT. PIPE \_\_\_\_\_  
 DISCH. PIPE \_\_\_\_\_  
 PSV DISCH. PIPE \_\_\_\_\_  
 PSV \_\_\_\_\_  
 SUCT. STRAINER \_\_\_\_\_  
 SUCT. DRAIN \_\_\_\_\_  
 SUCT. BLOCK VALVE \_\_\_\_\_  
 DISCH. BLOCK VALVE \_\_\_\_\_

DISSOLVING BASKET:  YES  NO

MATERIAL \_\_\_\_\_

PUMP MATERIALS: C.S.

CYLINDER OR HEAD \_\_\_\_\_  
 PLUNGER \_\_\_\_\_  
 DIAPHRAGM \_\_\_\_\_  
 VALVES: CHECKS \_\_\_\_\_  
 SEATS \_\_\_\_\_  
 BODY \_\_\_\_\_  
 PLUNGER GUIDE \_\_\_\_\_  
 LANTERN RING \_\_\_\_\_  
 GLAND \_\_\_\_\_  
 PACKING \_\_\_\_\_  
 BASEPLATE \_\_\_\_\_  
 HOUSING FRAME \_\_\_\_\_

SHOP TESTS: REQ'D. WITNESS

HYDROTEST PUMP X \_\_\_\_\_  
 PUMP MECH'L RUN X \_\_\_\_\_  
 PUMP PERFORMANCE \_\_\_\_\_  
 MIXER MECH'L RUN \_\_\_\_\_  
 CHECK CONTROLS X \_\_\_\_\_  
 SET PSV \_\_\_\_\_

SITE DATA:  INDOOR  OUTDOOR

CL. \_\_\_\_\_ GR. \_\_\_\_\_ DIV. \_\_\_\_\_  
 NON-HAZARDOUS.  
 AMBIENT \_\_\_\_\_ OF. MAX. & \_\_\_\_\_ OF. MIN.

APPLICABLE DOCUMENTS:

GENERAL NOTES \_\_\_\_\_  
 MOTOR SPEC. \_\_\_\_\_

NOTES:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

MIXER  YES  NO

MFR. \_\_\_\_\_  
 MODEL \_\_\_\_\_  
 MOUNT METHOD \_\_\_\_\_  
 SHAFT MATERIAL \_\_\_\_\_  
 IMPELLER MAT'L. \_\_\_\_\_  
 DRIVER:  
 HP \_\_\_\_\_  
 RPM \_\_\_\_\_  
 V./PH./HZ \_\_\_\_\_  
 ENCLOSURE \_\_\_\_\_  
 TYPE \_\_\_\_\_  
 F.L. AMPS \_\_\_\_\_  
 L.R. AMPS \_\_\_\_\_  
 INSUL. CLASS \_\_\_\_\_  
 OC. RISE \_\_\_\_\_

ATTACHMENT I TO REQUISITION 27-1910-1942N

INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

Control Valves

Air Operated

Masoneilan, Fisher Controls, Jamesbury

Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

Flow

Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

Flow Switches

Barton, Magnetrol, Peeco

Flow Glasses

Brooks, Fischer & Porter, Jerguson

Level

Gauge Glasses

Daniel Industries, Jerguson Valve & Gauge, Penberthy Houdaille

Pressure

Local Controllers

Fisher Controls, Foxboro, Taylor

Relief Valves

Consolidated, Crosby Valve & Gauge, Farris Engineering

Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division, Crosby Valve & Gauge

Temperature

Dial Thermometers

Ametek US Gauge Division, Dresser Industries Ashcroft Division, Palmer Instruments



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 1 OF 8

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	A-2720 A/B	27-1910-1942-L	21 Jul 80
MATERIAL	Gravity Filtration System	C1	23 Sep 80	C4	
OR		C2	6 Feb. 81	C5	
SERVICE		C3		C6	

Design, fabricate, and furnish all equipment required for a gravity filtration system including two (2) filters, to meet the requirements set forth herein.

**I. GENERAL**

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:
 

Mr. J. J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468
- E. All equipment covered by this requisition will be located indoors.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and identified at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-901

BY	J. J. Kunyz	P.O. NO.	SUPPLIER
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# REQUISITION



PAGE 2 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942-L

### I. GENERAL (cont'd.)

G. Equipment shall receive the following tests before shipment:

1. Hydrostatic test of assembled skids.
2. All wiring shall be tested and functionally checked. Other tests require by Part 16 of Job Spec. 1910-78A4 shall be made.
3. PURCHASER reserves the right to witness any or all tests. Specifics shall be determined later with the vendor.

H. The system of measurement shall be English.

J. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

### II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

1. Specifications and drawings, etc., which are furnished by the PURCHASER are listed on Page 8 of this requisition.
2. Other referenced drawings, specifications, standards and publications not listed on Page 8 are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

B. Codes

1. All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

### III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate(s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

FORM NO. 135-903

- 1. All electrical wiring and equipment shall be provided by the vendor.
- 2. All electrical wiring and equipment shall be provided by the vendor.
- 3. All electrical wiring and equipment shall be provided by the vendor.
- 4. All electrical wiring and equipment shall be provided by the vendor.

- 5. All finish painting.
- 6. Tracing and insulation for piping and equipment; however, insulation support rings or studs which are required on vessels shall be furnished by the vendor.
- 7. Motor starters for all drivers.
- 8. Sumps and sewers.

C. The following equipment and services shall be provided by the vendor:

- 1. The gravity filtration system to be supplied shall include, but not necessarily be limited to, the following equipment:
  - a) Gravity filters, skid mounted.
  - b) Storage/automatic backwash compartment.
  - c) All distributors.
  - d) Filter media (sand and/or anthracite)
  - d) All internal and backwash piping.
  - e) Internals and controls for air scouring.

FORM NO. 135-902



CHANGE NO.	2	DATE	6 APR. 81	REQUISITION NO.	27-1870-1885
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III. SCOPE OF WORK (cont'd.)

D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items:
  - A. Direct reading instruments (pressure gauges, level gauges, temperature gauges, etc.).
  - B. Sensors (thermocouples, thermometers and pressure switches, transmitters, alarm switches, etc.)
  - C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).
2. The following items will be provided by the purchaser:
  - A. Electronic controllers
  - B. Indicators
  - C. Alarms
  - D. Programmable controller digital logic
3. Instrument tag numbers will be provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.
4. Vendor shall provide junction box wiring schedules for all instrument wiring. Purchaser tag numbers shall be used.
5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.
6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

IV. DESIGN DATA

A. Process Requirements

Each gravity filter unit shall be capable of removing suspended solids from a coal gasification waste water stream.

FORM NO. 135-903



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 8

CHANGE NO. 2	DATE 6 Feb. 81	REQUISITION NO. 27-1910-1942-L
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#### IV. DESIGN DATA (cont'd.)

##### A. (cont'd.)

- |   |                 |
|---|-----------------|
| 1. Design flow, GPM (each filter)         | <u>225</u>      |
| 2. Normal flow, GPM (total)               | <u>152</u>      |
| 3. Hydraulic loading, GPM/Ft <sup>2</sup> | <u>4 (max.)</u> |
| 4. Temperature range                      | <u>Ambient</u>  |
| 5. Water influent conditions              |                 |

<u>Parameter</u>	<u>Avg. (Mg/l)</u>	<u>Max. (mg/l)</u>
Flow (gpm)	152	225
COD	510	1000
BOD <sub>5</sub>	66	130
TOC	223	450
TSS	25	50
TDS	3,135	4,000
NH <sub>3</sub> (Free & Fixed)	20	40
Phenolics	18	45
Oil	<5	<5
Cyanide (Free & Fixed)	20	45
Thiocyanate	98	200
pH	6-9	

##### 6. Effluent

Filtration system effluent to have TSS level of <5 mg/l @ 151 GPM and <10mg/l @ 225 GPM.

##### 7. Backwash rate and duration shall be specified by the vendor.

##### B. Utilities available are:

##### 1. Electrical Equipment Utilization Voltage

<u>SERVICE</u>	<u>POWER</u>
Instruments	115v/1 Phase/60 Hz
<1/2 HP Motors	115v/1 Phase/60 Hz
1/2-200 HP Motors	460v/3 Phase/60 Hz

Area classification: Non-Hazardous (Unclassified)

##### 2. Air - Plant and instrument air available 100 psig, 100°F. (Plant air is available for air scouring)

FORM NO. 135-803

# REQUISITION



PAGE 6 OF 8

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2

DATE 6 Feb. 81

REQUISITION NO. 27-1910-19A2-L

### IV. DESIGN DATA (cont'd.)

#### C. Site Data

1. Elevation above sea level (ft) 1050 (approx.)
2. Winter design temperature (°F) -10
3. Summer ambient temperature (°F) 92 (Max.)

### V. EQUIPMENT DESIGN AND CONSTRUCTION

- A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standard practices.
- B. Clear spacing between adjacent units on a skid shall be a minimum of 12 inches.
- C. Piping for each skid shall be manifolded to yield single flanged connections for each inlet or outlet service for the skid.
- D. The backwash cycle shall be initiated by excessive differential pressure across the filter media. An interlock shall be provided so that only one filter can be backwashed at one time. During the backwash of one filter the full design flow of 225 gpm shall be filtered by the second filter.
- E. The filter underdrain system shall be of the subfill-less type. Nozzles, and strainers shall be provided.

### VI. VENDOR'S BID INFORMATION

- A. The following information shall be included in the proposal:
  1. Piping and instrument diagram showing vessels, piping and controls and clearly indicating the scope of supply.
  2. An itemized descriptive list of equipment, valves, valve operators, piping and controls.
  3. Utilities required such as electricity, air for instruments and for valve operators, etc., for each skid.
  4. Extent of structural steel skid mounting giving the number, dimensions, shipping and operating weight of the skids and the number, size and type of piping connections.

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 8

CHANGE NO. 2

DATE 6 Feb. 81

REQUISITION NO. 27-1910-1942-L

## VI. VENDOR'S BID INFORMATION (cont'd.)

B. The following equipment data shall be completed and returned with the vendor's proposal.

Number of units	_____
Dimensions	_____
Shell material	_____
Plate thickness	_____
Design pressure	_____
Design temperature	_____
Filter media	_____
Bed depth	_____
Bed volume	_____
Uniformity coefficient/effective size	_____
Nozzles (Sizes and Rating)	_____
Inlet	_____
Outlet	_____
Drain	_____
Backwash outlet	_____
Lining material/thickness	_____
Backwash rate	_____
Length of backwash	_____
Volume of backwash	_____
Volume filtered between backwashes	_____
Differential pressure across unit clean/dirty	_____
Operating weight	_____
Shipping weight	_____
Skid size/number	_____

## VII. GUARANTEE

A. The vendor shall guarantee that the filtration system when installed and operated in accordance with his instructions will be capable of the following:

1. Treating the specified quantities of wastewater at the specified rate.
2. Producing an effluent with a quality as required by this requisition.

B. For mechanical guarantee see inquiry documents.

FORM NO. 135-903



CHANGE NO.

2

DATE

1964-10-14

27-940-1842

The following documents are to be considered an integral part of this requisition.

All design and fabrication shall comply with the referenced documents.

- 1910-1900A General Notes for Miscellaneous Equipment
- 1910-50A21.040 Working Material spec. 10
- 1910-52C1 Shop Field Fabricated Wiring
- 1910-60A1 Instrumentation
- 1910-78A4 Electrical Requirements for Control Systems
- 1910-83A1 Painting
- 1910-88C1 Welding Requirements for Equipment Fabricating
- 1910-95F2 Equipment Noise Control
- 1910-97A1 Preparation of Material for Shipment

FORM NO. 100-10



# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE · LIVINGSTON, NEW JERSEY, 07039 · PHONE 201-533-1100

Attachment I to Req. 27-1910-1942L

## INSTRUMENT VENDORS

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

#### Flow

#### Flow Glassess

Brooks, Fischer & Porter, Jergusen

#### Level

#### Differential Pressure Transmitter

Foxboro, Taylor, Rosemount

#### Gauge Glasses

Daniel Industries, Jurguson Valve & Gauge, Penberthy Houdaille

#### Float Switches

Magnetrol International, Fisher Controls, Delta Controls

#### Pressure

#### Transmitters

Foxboro, Taylor, Rosemount

#### Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

#### Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge

#### Pressure Differential (For Filters)

Orange Research, Meriam, Midwest Instruments





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.	A-2722	27-1910-1942M		27 Aug. 80	
MATERIAL	EVAPORATION SYSTEM			C1	16 Dec. 80	C4	
OR				C2	6 Feb. 81	C5	
SERVICE				C3		C6	

Design, fabricate, and furnish all equipment required for a vapor recompression type evaporation system to meet the requirements set forth herein.

I. GENERAL

- A. Equipment offered shall be essentially the standard product of the manufacturer to permit continuance of services and rapid delivery of spare parts. The manufacturer shall state in the proposal the per diem rate for field start-up and the conditions under which it shall be rendered.
- B. It is the intent of this requisition to secure a complete installation such that the equipment will operate as outlined in this document with no deficiencies, and any item necessary to accomplish this result is to be considered as incorporated herein.
- C. In the case of conflicting or incomplete technical information, it shall be the responsibility of the SELLER to bring these conflicts or deficiencies to the PURCHASER's attention prior to the submission of the proposal or the prosecution of any work.
- D. Where additional technical information is required to make a complete bid, the SELLER shall contact:

J. J. Kunyz  
Foster Wheeler Energy Corporation  
110 South Orange Avenue  
Livingston, New Jersey 07039

Telephone: (201) 533-2468

- E. Most equipment covered by this requisition will be located indoors, the evaporator will be outdoors.
- F. The equipment shall be shop fabricated and skid mounted to maximum extent possible consistent with shipping limitations. All equipment shall be securely mounted and braced for shipment; all internals installed; all piping, valves, and fittings associated with a specific skid installed; all necessary pneumatic tubing completely installed, terminated and identified at a single panel per skid; and all electrical interconnections installed, terminated and identified at a single terminal strip per skid. All electrical terminal strips shall be in a junction box separate from instrumentation. No motor circuits shall be installed to a junction box containing other terminals. Each skid shall be equipped with lifting lugs to facilitate handling. Components which cannot be shipped as a unit, must be tagged and identified to facilitate field installation.

FORM NO. 135-901

BY	J.J.K.	P.O. NO.	SUPPLIER
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# REQUISITION



PAGE 2 OF 18

FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2 DATE 6 Feb. 81 REQUISITION NO. 27-1910-19424

## I. GENERAL (cont'd)

G. Equipment shall receive the following tests before shipment:

1. Certified hydrostatic test of individual vessels.
2. Hydrostatic test of assembled skids.
3. Functional electrical test.
4. Manufacturer's standard shop tests for various components.

H. The system of measurement shall be English.

J. Schedule of Materials Shipment

Vendor's quotation shall give his proposed schedules of materials shipment from factory. Materials shall be prepared for shipment in accordance with FWEC Specification 1910-97A1.

## II. CODES, RULES, SPECIFICATIONS AND STANDARDS

A. The scope of work set forth in this Requisition is further defined by referenced specifications, standards, and drawings. These form an integral part of the work requirements.

1. Specification and drawings, etc., which are furnished by the PURCHASER are listed on Page 7 of this requisition.
2. Other referenced drawings, specifications, standards and publications not listed are to be provided by the SELLER and it is his responsibility to be fully aware of their content as related to the work.

### B. Codes

1. All equipment and/or materials shall be in accordance with all Governmental and local codes, laws, rules and regulations applicable thereto. Any conflict between PURCHASER's drawings, specifications, standards, etc., and applicable codes, etc., shall immediately be brought to the attention of the PURCHASER.

## III. SCOPE OF WORK

A. The vendor shall quote on the base system outlined in this requisition. The vendor may also quote on any alternate (s) that offer significant advantages over the base system and clearly identify these advantages in his proposal.

B. The following equipment and services will be provided by others:



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 18

CHANGE NO. 2      DATE 6 Feb. 81      REQUISITION NO. 27-1910-1942M

### III. SCOPE OF WORK (cont'd)

#### B. (Cont'd)

1. Foundation and anchor bolts for all equipment. Vendor to furnish loading diagrams for all equipment within his scope of supply.
2. Installation and erection of all equipment and piping.
3. Interconnecting piping between individual equipment skids.
4. Interconnections, pneumatic and electrical, between equipment skids.
5. All finish painting.
6. Tracing and insulation for piping and equipment; however, insulation support rings or studs which are required on vessels shall be furnished by the vendor.
7. Motor starters for all drivers, and electrical cable.
8. Sumps and sewers.

#### C. The following equipment and services shall be provided by the vendor:

The Evaporation System shall include, but not necessarily be limited to the following items:

- Evaporator Feed Tank with Agitator for pH Control
- Brine Holdup Tank
- Evaporation Feed Preheater
- Evaporator
- Deaerator
- Evaporation Feed Pumps
- Evaporator Circulation Pumps
- Condensate Pumps
- Brine Mixer
- Evaporation Compressor
- Condensate Flash Drum
- Seed Tank and Pump

#### D. Scope of Instrumentation

1. The Vendor shall supply the following instrument items:
  - A. Direct reading instruments (pressure gages, level gages, temperature gages, etc.).
  - B. Sensors (thermocouples, temperature and pressure switches, transmitters, etc.).



# REQUISITION

PAGE 4 OF 18

## FOSTER WHEELER ENERGY CORPORATION

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION NO.	27-1910-1942 M
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### III. SCOPE OF WORK (cont'd)

#### D. Scope of Instrumentation (cont'd)

##### 1. (Cont'd)

C. All actuating devices (control valves, electric and pneumatic positioners, relays, etc.).

##### 2. The following items will provided by the purchaser:

A. Electronic controllers.

B. Indicators.

C. Alarms.

D. Programmable controller digital logic.

3. Instrument tag numbers will provided by purchaser and are to be used on vendor drawings to identify instrument locations and connections.

4. Vendor shall provide junction box wiring schedules for all instruments wiring. Purchaser tag numbers shall be used.

5. Vendor shall provide ladder diagrams or logic flow diagrams for all required control sequences.

6. For standardization of instrumentation throughout the plant, items furnished by the vendor shall comply with Attachment I.

### IV. DESIGN DATA

#### A. Process Requirements

The Evaporation System shall evaporate a composite coal gasification wastewater stream.

The influent steam will be pretreated to the following approximate levels:

<u>Constituent</u>	<u>Conc. Range (mg/l)</u>	<u>Constituent</u>	<u>Conc. Range (mg/l)</u>
COD	110-220	Al	0.2-0.5
BOD <sub>5</sub>	15-30	As	0.1-0.2
TOC <sub>5</sub>	50-105	Be	0.001
TSS	< 5	Cd	0.008-0.02

FORM NO. 135-903



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 18

CHANGE NO. 2	DATE 6 Feb. 81	REQUISITION NO. 27-1910-1942M
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### IV. DESIGN DATA (cont'd.)

#### A. (cont'd.)

Constituent	Conc. Range (mg/l)	Constituent	Conc. Range (mg/l)
NH <sub>3</sub>	20	Co	0.005-0.01
Phenolics	< 1	Cr	0.09-0.22
Oil	< 5	Cu	0.01
CN-(Free)	≈ 1	Fe	0.1
CN-(Fixed)	≈ 19	Hg	0.0027
Thiocyanate	50-100	Mn	0.03
TDS	3,116 -4,275	Mo	0.015-0.04
Na <sup>+</sup>	1,075-1,325	Ni	0.018-0.04
Ca <sup>++</sup>	50-70	Pb	0.008-0.02
Mg <sup>++</sup>	40-50	Sb	0.015-0.04
K <sup>+</sup>	10-25	Se	0.2
Silica (as SiO <sub>2</sub> )	≈ 5	U	0.01-0.02
CL <sup>-</sup>	550-815	V	0.01-0.03
SO <sub>4</sub> <sup>=</sup>	1,590-1,830	Zn	0.02
CO <sub>3</sub> <sup>=</sup>	60-75		
F <sup>-3</sup>	≈ 45		

The system shall handle a normal flow of 157 GPM , with a maximum of 250 GPM.

The system shall be capable of the following:

1. A guaranteed condensate stream of less than 10 mg/l TDS (inorganic salts only).
2. Condensate recovery better than 98% (vendor to confirm).
3. Producing a brine to be spray dried by Purchaser. Vendor shall provide expected brine composition data.

#### B. Utilities available are:

##### 1. Electrical Equipment Utilization Voltage

###### SERVICE

Instruments  
 < 1/2 HP Motors  
 1/2-200 HP Motors

###### POWER

115 v/1 Phase/60 Hz  
 115v/1 Phase/60 Hz  
 460v/3 Phase/60 Hz

Area classification: Non-Hazardous

# REQUISITION



PAGE 6 OF 18

FOSTER WHEELER ENERGY CORPORATION

CHANGE NO. 2 | DATE 6 Feb. 81 | REQUISITION NO. 27-1910-1942M

#### IV. DESIGN DATA (cont'd.)

##### B. (cont'd.)

2. Air - Plant and instrument air available at 100 psig, 100°F.

##### C. Site Data

1. Elevation above sea level (ft) 1050 (approx.)
2. Winter design temperature (°F) -10
3. Summer ambient temperature (°F) 92 (Max.)

#### V. EQUIPMENT DESIGN AND CONSTRUCTION

- A. All equipment design and construction shall conform with the latest edition of the applicable sections of ASME, ASTM, NEC, NEMA and other governing codes or standards practices.
- B. Clear spacing between adjacent units on a skid shall be a minimum of 12 inches.
- C. Piping for each skid shall be manifolded to yield a single flanged connection for each inlet or outlet service for the skid.

#### VI. GUARANTEE

- A. The vendor shall guarantee that the evaporation system, when installed and operated in accordance with his instructions, will be capable of treating the quoted quantities of wastes at the specified rates.
- B. For mechanical guarantee, see inquiry documents.

#### VII. VENDOR'S BID INFORMATION

The following information shall be included in the vendor proposal as a minimum:

- a) Piping and instrument diagram showing vessels, pumps, piping, controls, etc. This diagram shall clearly indicate the vendor's scope of supply.
- b) An itemized descriptive list of equipment, valves, piping and controls.
- c) Electricity, plant and instrument air, and steam requirements.
- d) Extent of skid mounting giving the number and dimensions of skids, weights of skids and number, size and type of piping connections.
- e) An itemized list of exceptions to this requisition.



## REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 18

CHANGE NO.

2

DATE

6 Feb. 81

REQUISITION NO.

27-1910-1942M

### VII. VENDORS BID INFORMATION (cont'd.)

8) The tender shall furnish the following information, as a minimum:

1. Tanks and drums: size, material, design pressure and temperature, empty weight, operating weight, and flooded weight.
2. exchangers: complete attached exchanger data sheet (pg. 8) for each item.
3. Pumps: complete attached pump data sheets (pg 9 or pg 10) for each item.
4. Compressors: complete attached compressor data sheets (pgs.11 to 17)for each item.
5. Motors: complete attached motor data sheet (pg. 18) for motors.

### VIII. REFERENCED DOCUMENTS

The following documents are to be considered an integral part of this requisition. All design and fabrication shall comply with these referenced documents.

1910-10A1 Welded Unfired Pressure Vessels  
1910-14A1 API Storage Tanks  
1910-21A1 Tubular Exchangers  
1910-31A3 Centrifugal Pumps for General Duty Service  
1910-32A1 Special Purpose Centrifugal Compressors  
1910-38A6 Low Voltage NEMA Frame TEFC & XP Induction Motors  
1910-38A7 Medium Voltage and Non-NEMA Frame Induction Motors  
1910-39A2 Lube and Seal Oil Systems  
1910-46A1 Structural Steel  
1910-50A1 Piping  
1910-50A2 Gaskets and Surface Finish for Bolted Flanged Joints  
1910-52C1 Shop and Field Fabricated Piping  
1910-60A1 Instrumentation  
1910-78A4 Electrical Requirements for Packaged Systems  
1910-83A1 Painting  
1910-88C1 Welding Requirements for Equipment & Piping  
1910-95A2 Noise Control-Equipment  
1910-97A1 Preparation of Material for Shipment  
1910-1900A General Notes for Miscellaneous Equipment

**MATERIAL REQUISITION**  
 FOSTER WHEELER ENERGY CORPORATION  
 110 SOUTH ORANGE AVENUE, LIVINGSTON, N. J.

SHELL & TUBE  
 EXCHANGERS

CONTRACT NO. 15-1910		REQ'N. NO. 27-1910-1942M		DATE 27 AUG 80		
CUSTOMERS NAME CONOCO / DOE			LOCATION NOBLE COUNTY, OHIO			
SUPERSEDED BY						
CHANGE NO.	C-1	C-2	C-3	C-4	C-5	
DATE	16 DEC 80	6 Feb. 81				
SERVICE OF UNIT				ITEM NO.		
SIZE	TYPE		(HORIZ) (VERT)	CONNECTED IN		
SQ. FT. SURF./UNIT (GROSS) (EFF)	SHELLS/UNIT		SQ. FT. SURF./SHELL (GROSS) (EFF)			
<b>PERFORMANCE OF ONE UNIT</b>						
	SHELL SIDE			TUBE SIDE		
FLUID CIRCULATED						
TOTAL FLUID ENTERING				LB/HR	LB/HR	
VAPOR				LB/HR	LB/HR	
LIQUID				LB/HR	LB/HR	
STEAM				LB/HR	LB/HR	
NON-CONDENSABLES				LB/HR	LB/HR	
FLUID (VAPORIZED)(CONDENSED)				LB/HR	LB/HR	
STEAM CONDENSED				LB/HR	LB/HR	
GRAVITY						
VISCOSITY						
MOLECULAR WEIGHT						
SPECIFIC HEAT				BTU/LB-°F	BTU/LB-°F	
THERMAL CONDUCTIVITY				BTU/HR-FT-°F	BTU/HR-FT-°F	
LATENT HEAT				BTU/LB	BTU/LB	
TEMPERATURE IN				°F	°F	
TEMPERATURE OUT				°F	°F	
OPERATING PRESSURE, INLET				(PSIA)(PSIG)	(PSIA)(PSIG)	
NO. PASSES PER SHELL						
VELOC'Y				FT/SEC	FT/SEC	
PRESSURE DROP - ALLOW.   CALC'D.			PSI	PSI	PSI	
FOULING RESISTANCE, MIN.						
HEAT EXCHANGED - BTU/HR.				MTD CORRECTED-°F		
TRANSFER RATE - SERVICE				CLEAN		
<b>CONSTRUCTION OF ONE SHELL</b>						
DESIGN PRESSURE				PSIG	PSIG	
TEST PRESSURE				PSIG	PSIG	
DESIGN TEMPERATURE				°F	°F	
TUBES	NO.	O.D.	BWG	{AYS (MIN)	LENGTH	PITCH
SHELL	I.D.		SHELL COVER		(INTEG)(REMOV)	
CHANNEL OR BONNET			CHANNEL COVER			
TUBESHEET - STATIONARY			TUBESHEET - FLOATING			
BAFFLES - CROSS	TYPE			FLOATING HEAD COVER		
BAFFLES - LONG	TYPE			IMPINGMENT PROTECTION		
TUBE SUPPORTS						
TUBE TO TUBESHEET JOINT						
GASKETS						
CONNECTIONS - SHELL SIDE	IN			OUT	RATING	
CONNECTIONS - TUBE SIDE	IN			OUT	RATING	
CORROSION ALLOWANCE - SHELL SIDE	IN.		TUBE SIDE		IN.	
CODE REQUIREMENTS				TEMA CLASS		
REMARKS: (1) NOZZLE & SUPPORT LOCATION TO BE AS NOTED ON F.W. STD. 21B11.1						
(2) FOR GENERAL NOTES REFER TO REQ'N. 1910-1900A WHICH IS AN INTEGRAL PART OF THIS REQ'N						





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 9 OF 18

CLIENT <b>CONOCO/DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO.		DATE		
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO.		<b>27-1910-1942M</b>		<b>27 AUG 80</b>		
MATERIAL <b>CENTRIFUGAL PUMP</b>		NO. REQ'D.		C1	<b>16 DEC 80</b>	C4		
SERVICE				C2	<b>6 Feb 81</b>	C5		
MFR.		MODEL		C3		C6		
SIZE								
1	OPERATING CONDITIONS, EACH PUMP			PERFORMANCE				
2	LIQUID	U. S. GPM RATED		PROPOSAL CURVE NO.				
3	PUMPING TEMP DEG F	U. S. GPM NORMAL		SPEED RPM		NO. STAGES		
4	MAX. P T, DEG F	MAX SUCTION PSIG		NPSHR, FT (H <sub>2</sub> O)		MIN CONT. GPM		
5	S. G. AT PT	DISCH. PRESS. PSIG		SHUTOFF HD. FT		% EFF. @ RATED GPM		
6	VAP. PRESS., PSIA @ PT	SUCTION PRESS., PSIG		BHP @ RATED GPM		MAX BHP		
7	VISC. @ PT, CP	DIFF. PRESS., PSI		IMPELLER DIA. IN		RATED	MAX MIN	
8	CORR./ EROS. FROM	DIFF. HEAD, FT		MAX. ALLOW. CASING PSIG/DEG F				
9		NPSH AVAIL, FT		HYDROSTATIC TEST PRESS. PSIG				
10	PCT & SIZE SOLIDS	(MEAS. TO <input type="checkbox"/> PUMP <input type="checkbox"/> SUCT. FLG)		MAX POSSIBLE DISCH. PRESS. PSIG				
11	CONSTRUCTION			ROTATION FACING COUPLING <input type="checkbox"/> CW <input type="checkbox"/> CCW				
12	CASING SPLIT	<input type="checkbox"/> AXIAL	<input type="checkbox"/> RADIAL	CONNECTIONS	SUCTION	DISCHARGE		
13	CASING VOLUTE	<input type="checkbox"/> SINGLE	<input type="checkbox"/> DOUBLE	<input type="checkbox"/> DIFFUSER	SIZE, INCHES			
14	CASING SUPPORT	<input type="checkbox"/> FOOT	<input type="checkbox"/> CENTERLINE		RATING/FACING			
15		<input type="checkbox"/> BRACKET	<input type="checkbox"/> VERTICAL IN-LINE		LOCATION			
16	CASING CONNS.	<input type="checkbox"/> VENT	<input type="checkbox"/> DRAIN	<input type="checkbox"/> GAUGE	DRIVER			
17	IMPELLER TYPE				FURNISHED BY	<input type="checkbox"/> PUMP MFR	<input type="checkbox"/> OTHERS	
18	IMPELLER MTG.	<input type="checkbox"/> BETWEEN BRGS	<input type="checkbox"/> OVERHUNG		MOUNTED BY	<input type="checkbox"/> PUMP MFR	<input type="checkbox"/> OTHERS	
19	WEAR RINGS	<input type="checkbox"/> CASING	<input type="checkbox"/> IMPELLER	<input type="checkbox"/> INLET	<input type="checkbox"/> BACK	<input type="checkbox"/> MOTOR: ITEM NO. TYPE		
20	BEARINGS-TYPE: RADIAL	THRUST		HP	RPM	FRAME NO.		
21	BEARINGS-LUBE:	<input type="checkbox"/> RING	<input type="checkbox"/> FLOOD	<input type="checkbox"/> FLINGER	ENCL.	INSUL.	S. F.	
22		<input type="checkbox"/> OIL MIST	<input type="checkbox"/> PRESSURE LUBE		MFR	V	PH HZ	
23	COUPLING: MFR	TYPE		GUARD TYPE		FLA	LRA LUBE	
24	DRIVER HALF MTD BY	<input type="checkbox"/> PUMP MFR	<input type="checkbox"/> DRIVER MFR	<input type="checkbox"/> OTHERS		THRUST (VERT) LB	UP DOWN	
25	SHAFT SEAL TYPE	<input type="checkbox"/> PACKING	<input type="checkbox"/> MECHANICAL		<input type="checkbox"/> TURBINE: ITEM NO. MFR.			
26	PACKING MFR, TYPE	SIZE	NO. RINGS		REFER TO PAGE ATTACHED			
27	SEAL MFR, MODEL	TYPE		TESTS	REQUIRED WITNESSED CERTIFIED			
28	MFR, CODE	API CODE		SHOP INSPECT	<input type="checkbox"/>			
29	BASEPLATE	<input type="checkbox"/> EXTENDED FOR DRIVER		<input type="checkbox"/> DRAIN RIM	PERFORMANCE	<input type="checkbox"/>	<input type="checkbox"/>	
30					NPSHR	<input type="checkbox"/>	<input type="checkbox"/>	
31	WATER COOLING & SEAL FLUSH PIPING			HYDROTEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
32	WATER COOLED	<input type="checkbox"/> BEARINGS	<input type="checkbox"/> STUFFING BOX JACKET			<input type="checkbox"/>	<input type="checkbox"/>	
33		<input type="checkbox"/> GLAND	<input type="checkbox"/> PEDESTALS		MATERIALS-API CLASS-			
34	C. W., PLAN	WITH	<input type="checkbox"/> CS	<input type="checkbox"/> SS	<input type="checkbox"/> TIIRING	<input type="checkbox"/> PIPE		
35	TOTAL COOLING WATER REQUIRED, GPM			CASING	IMPELLER			
36	SEAL FLUSH, PLAN	WITH	<input type="checkbox"/> CS	<input type="checkbox"/> SS	<input type="checkbox"/> TUBING		<input type="checkbox"/> PIPE	
37	EXT. FLUSH, LIQUID	@	DEG F	GPM	WEAR RINGS	GLAND		
38					BASEPLATE			
39	ACCESSORIES FURNISHED BY PUMP MFR			WEIGHTS, LBS EACH				
40	<input type="checkbox"/> SEAL FLUSH PIPING	<input type="checkbox"/> STEAM JACKETING		PUMP	BASEPLATE			
41	<input type="checkbox"/> COOLING WATER PIPING			MOTOR	TURBINE			
42	<input type="checkbox"/> OIL PIPING			SITE & UTILITIES (PER Pg. 5 & 6)				
43	<input type="checkbox"/> MINIMUM FLOW ORIFICE			<input type="checkbox"/> INDOORS	<input type="checkbox"/> OUTDOORS			
44	NOTES			AMBIENT	DEG F MAX TO	DEG F MIN		
45				CL GR	DIV	<input type="checkbox"/> NON-HAZARDOUS		
46				ALT. FT	COOLING WATER SOURCE			
47				DEG F: IN,	OUT: PSIG	IN,	OUT	
48				DOCUMENTS (PER Pg. 7)				
49				<input type="checkbox"/>	-1300A	<input type="checkbox"/>		
50			<input type="checkbox"/>		<input type="checkbox"/>			
51			<input type="checkbox"/>		<input type="checkbox"/>			
BY	P. O. NO.		VENDOR					

FORM NO. 135-302



FOR <u>CONOCO/DOE</u>	F.W. CONTRACT <u>15-1910</u>	REQUISITION NUMBER	DATE
SITE <u>NOBLE COUNTY, OHIO</u>		<u>27-1910-1942 M</u>	<u>27 AUG 80</u>
ITEM NO. _____	SERVICE _____	SUPERSEDED BY CHANGE NO.:	
MFR. _____	MODEL _____	NO. REQ'D.	
		C1 <u>16 Dec 83</u>	C3 _____
		C2 <u>6 Feb 81</u>	C4 _____
			C5 _____
			C6 _____

**PROCESS REQUIREMENTS:**

LIQUID \_\_\_\_\_

TEMP., °F. \_\_\_\_\_

SP. GR. \_\_\_\_\_

NPSHA, FT. \_\_\_\_\_

U.S. GPH: MAX. \_\_\_\_\_

MIN. \_\_\_\_\_

DISCH. PSIG \_\_\_\_\_

SUCT. PSIG \_\_\_\_\_

DIFF. PS: \_\_\_\_\_

MIN. REQ'D CONTROL \_\_\_\_\_

**PUMP DRIVER: (BY PUMP MFR.)**

MOTOR:

MFR. \_\_\_\_\_

HP \_\_\_\_\_

RPM \_\_\_\_\_

SERVICE FACTOR \_\_\_\_\_

V./PH./HZ. \_\_\_\_\_

ENCLOSURE \_\_\_\_\_

TYPE \_\_\_\_\_

FRAME NO. \_\_\_\_\_

F.L. AMPS \_\_\_\_\_

L.R. AMPS \_\_\_\_\_

INSUL. CLASS \_\_\_\_\_

OC. RISE \_\_\_\_\_

**PACKAGE UNIT:**  REQ'D.  NONE

**TANK (WITH LEGS & PUMP PLATFORM):**

U.S. GAL. CAPACITY \_\_\_\_\_

MATERIAL \_\_\_\_\_

TYPE COVER \_\_\_\_\_

TYPE BOTTOM \_\_\_\_\_

MIXER BRACKET \_\_\_\_\_

DIA. X HEIGHT \_\_\_\_\_

TOTAL UNIT HEIGHT \_\_\_\_\_

FILL CONN. #1 \_\_\_\_\_

FILL CONN. #2 \_\_\_\_\_

OVERFLOW CONN. \_\_\_\_\_

DRAIN CONN. \_\_\_\_\_

DRAIN PLUG \_\_\_\_\_

DRAIN VALVE \_\_\_\_\_

GAGE GL. CONNS. \_\_\_\_\_

GAGE & COCKS \_\_\_\_\_

HEATER \_\_\_\_\_

LEVEL SWITCH \_\_\_\_\_

FLOAT \_\_\_\_\_

**PUMP DATA:**

NO. OF HEADS \_\_\_\_\_

PLUNGER DIA. \_\_\_\_\_

MAX. STROKE \_\_\_\_\_

RPM \_\_\_\_\_

U.S. GPH MAX. \_\_\_\_\_

MIN. \_\_\_\_\_

MAX. WORK. PSIG \_\_\_\_\_

HYDROTEST PSIG \_\_\_\_\_

PSV SET. PSIG \_\_\_\_\_

NPSHR FT. \_\_\_\_\_

MAX. TEMP. °F \_\_\_\_\_

NET BHP REQ'D \_\_\_\_\_

CONTROL METHOD \_\_\_\_\_

**GEAR:**

MFR. \_\_\_\_\_

RATED BHP \_\_\_\_\_

SERVICE FACTOR \_\_\_\_\_

TYPE \_\_\_\_\_

**PIPING SYSTEMS:**

MATERIAL \_\_\_\_\_

SIZE/RATING: \_\_\_\_\_

SUCT. PIPE \_\_\_\_\_

DISCH. PIPE \_\_\_\_\_

PSV DISCH. PIPE \_\_\_\_\_

PSV \_\_\_\_\_

SUCT. STRAINER \_\_\_\_\_

SUCT. DRAIN \_\_\_\_\_

SUCT. BLOCK VALVE \_\_\_\_\_

DISCH. BLOCK VALVE \_\_\_\_\_

**CHECKS:** TYPE \_\_\_\_\_

NO. PER VALVE \_\_\_\_\_

PACKING TYPE \_\_\_\_\_

SUCTION: SIZE \_\_\_\_\_

RATING \_\_\_\_\_

DISCH.: SIZE \_\_\_\_\_

RATING \_\_\_\_\_

**COUPLING:**

MFR. \_\_\_\_\_

TYPE \_\_\_\_\_

MODEL \_\_\_\_\_

**DISSOLVING BASKET:**  YES  NO

MATERIAL \_\_\_\_\_

**PUMP MATERIALS:**

CYLINDER OR HEAD \_\_\_\_\_

PLUNGER \_\_\_\_\_

DIAPHRAGM \_\_\_\_\_

VALVES: CHECKS \_\_\_\_\_

SEATS \_\_\_\_\_

BODY \_\_\_\_\_

PLUNGER GUIDE \_\_\_\_\_

LANTERN RING \_\_\_\_\_

GLAND \_\_\_\_\_

PACKING \_\_\_\_\_

BASEPLATE \_\_\_\_\_

HOUSING FRAME \_\_\_\_\_

**GUARDS:**

COUPLING \_\_\_\_\_

MOVEMENTS \_\_\_\_\_

MAT'L. \_\_\_\_\_

(GUARD REQ'D. FOR ALL EXPOSED MOVING PARTS AND COUPLINGS)

**MIXER (AGITATOR):**  YES  NO

MFR. \_\_\_\_\_

MODEL \_\_\_\_\_

MOUNT METHOD \_\_\_\_\_

SHAFT MATERIAL \_\_\_\_\_

IMPELLER MAT'L. \_\_\_\_\_

**DRIVER:**

**SHOP TESTS: REQ'D. WITNESS**

HYDROTEST PUMP \_\_\_\_\_

PUMP MECH'L RUN \_\_\_\_\_

PUMP PERFORMANCE \_\_\_\_\_

MIXER MECH'L RUN \_\_\_\_\_

CHECK CONTROLS \_\_\_\_\_

SET PSV \_\_\_\_\_

HP \_\_\_\_\_

RPM \_\_\_\_\_

V./PH./HZ \_\_\_\_\_

ENCLOSURE \_\_\_\_\_

TYPE \_\_\_\_\_

F.L. AMPS \_\_\_\_\_

L.R. AMPS \_\_\_\_\_

INSUL. CLASS \_\_\_\_\_

OC. RISE \_\_\_\_\_

**NOTES:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**SITE DATA:**  INDOOR  OUTDOOR

CL.  GR.  DIV. \_\_\_\_\_

NON-HAZARDOUS.

AMBIENT °F. MAX. & °F. MIN. \_\_\_\_\_

(PER Pg 5 & 6)

**APPLICABLE DOCUMENTS:**

GENERAL NOTES \_\_\_\_\_

MOTOR SPEC. \_\_\_\_\_

(PER Pg 7)



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT <u>CONOCO/DOE</u>		CONTRACT <u>15-1910</u>		REQUISITION		DATE	
SITE <u>NOBLE COUNTY, OHIO</u>		ITEM		<u>27-1910-1942M</u>		<u>27 AUG 80</u>	
MATERIAL <u>CENTRIFUGAL COMPRESSOR</u>		C1	<u>16 DEC 80</u>	C4			
SERVICE		C2	<u>6 Feb. 81</u>	C5			
NO. REQUIRED		C3		C6			
MANUFACTURER							
1	CONDITIONS OF SERVICE FOR EACH UNIT			RATED			
2							
3	GAS HANDLED (SEE ANALYSIS BELOW)						
4	RELATIVE HUMIDITY, %						
5	MOLECULAR WEIGHT						
6	Cp/Cv (AVERAGE)						
7	COMPRESSIBILITY FACTOR @ INLET Z1						
8	COMPRESSIBILITY FACTOR @ DISCH. Z2						
9	CAPACITY (MOLS/HR) (SCFM) <input type="checkbox"/> WET <input type="checkbox"/> DRY						
10	CFM @ INLET CONDITIONS						
11	WEIGHT FLOW. (Lb/Min.)						
12	INLET PRESSURE, Psia						
13	INLET TEMPERATURE, °F						
14	DISCH. PRESSURE, Psia						
15	DISCH. TEMPERATURE, °F						
16	POLYTROPIC HEAD Ft. - Lb/Lb.						
17	POLYTROPIC EFFICIENCY						
18	COMPRESSOR BHP						
19	COMPRESSOR RPM						
20	BHP REQUIRED AT DRIVER SHAFT						
21	EST. SURGE CAPACITY @ RATED RPM, ICFM						
22	DISCH. TEMP. @ SURGE CAPACITY AND RATED RPM						
23							
24	GAS COMPOSITION		MOL. WT.	MOL. %	MOL. %	MOL. %	MOL. %
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37	DRIVER			LOCATION			
38	TYPE		<input checked="" type="checkbox"/> INDOOR (HEATED)		<input type="checkbox"/> ROOF ONLY	<input type="checkbox"/> AT GRADE	
39	RATED BHP		RPM	<input type="checkbox"/> OUTDOOR	<input type="checkbox"/> UNHEATED	<input type="checkbox"/> MEZZANINE	
40							
41	SUPPLIED BY <input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER		SITE ELEV. <u>1050</u> FT. BAROMETER		<u>14.21</u> PSIA		
42	MOUNTED BY <input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER		AMBIENT TEMP. <u>92</u> °F MAX		<u>-10</u> °F MIN.		
43							
44	REFER TO PAGE <u>18</u> OF THIS		AREA CLASSIFICATION		<input checked="" type="checkbox"/> NON-HAZARDOUS		
45	REQUISITION FOR DRIVER DATA		<input type="checkbox"/> CLASS		GROUP	DIV	
46							
47	APPLICABLE DOCUMENTS			SEVERE AMBIENT CONDITIONS			
48	REFER TO PAGE <u>7</u> OF THIS		<input type="checkbox"/> CHEM. PLANT ATMOS.		<input type="checkbox"/> DUSTY ATMOS.		
49	REQUISITION		<input type="checkbox"/> HIGH HUMIDITY		<input type="checkbox"/> SEA COAST ATMOS.		
50							
51							
BY	P. O.			VENDOR			

FORM NO. 135-310



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CENTRIFUGAL  
COMPRESSOR  
PAGE 12 OF 18

CHANGE NO.	2	DATE	6 Feb. 81		REQUISITION	27-1910-1942M	
<b>COMPRESSOR CONSTRUCTION</b>							
1	MODEL NO.	NO. STAGES			SHAFT SEALS		
2	TYPE				TYPE		
3					SEAL SYSTEM TYPE		
4	MAX. CONTINUOUS SPEED				RPM		
5	TRIP SPEED				RPM	MAX. GAS PRESSURE @ SEALS	
6	CALC. FIRST CRITICAL				RPM	INNER SEAL OIL LEAKAGE, EXPECTED	
7	CALC. SECOND CRITICAL				RPM	GUARANTEED	
8					GPS/SEAL		
9	ROTATION FACING DRIVEN END				<input type="checkbox"/> CW	<input type="checkbox"/> CCW	TYPE BUFFER GAS
10	MACHINED DIMENSIONS				<input type="checkbox"/> ENGLISH	<input type="checkbox"/> METRIC	BUFFER GAS FLOW
11					NORMAL	LBS/MIN @	PSI AP
12	CASING SPLIT				<input type="checkbox"/> HORIZONTAL	<input type="checkbox"/> VERTICAL	MAX. LBS/MIN @
13	SPLIT SEALING TYPE				PSI AP		
14	CASING CONSTRUCTION				<input type="checkbox"/> CAST	<input type="checkbox"/> FABRICATED	RADIAL BEARINGS
15					<input type="checkbox"/> FORGED	TYPE	
16	NOZZLE CONSTRUCTION				<input type="checkbox"/> CAST	<input type="checkbox"/> FABRICATED	LOADING, PSI ACTUAL
17					<input type="checkbox"/> INTEGRAL	<input type="checkbox"/> WELDED TO CASING	PSI RATED
18					BEARING SHELL MATERIAL		
19	CASING MATERIAL				THRUST BEARING		
20	SEAL O-RING MATERIAL				TYPE		
21					MFR.	AREA	SQ. IN.
22	MAX. ALLOWABLE WORKING PRESS.				PSIG	LOADING, °	PSI ACTUAL
23	HYDROSTATIC TEST PRESSURE				PSIG	PSI RATED	
24	MAX./MIN. ALLOW. OPER. TEMP.				/	° F	* INCLUDING COUPLING LOCK-UP THRUST
25	<b>AUXILIARY CONNECTIONS</b>						
26	DIAPHRAM MATERIAL				<input type="checkbox"/> CASING DRAIN CONNS.		
27	STAGE GUIDE VANES				<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> AT EACH SUCTION/DISCH. LOW POINT
28					<input type="checkbox"/> AT EACH STAGE		
29	IMPELLER DIAMETERS				IN.	<input type="checkbox"/> PLUGGED	
30	ROTOR WR <sup>2</sup>				LB-FT <sup>2</sup>	<input type="checkbox"/> VALVED AND PIPED TO FLANGED CONN.	
31	TIP SPEED @ MAX. CONTIN. RPM				FPS	AT EDGE OF BASEPLATE	
32	MAX. MACH. NO. @ IMPELLER EYE						
33	IMPELLER TYPE				<input type="checkbox"/> CLOSED	<input type="checkbox"/> OPEN	<input type="checkbox"/> SOLVENT INJECTION CONNS.
34					<input type="checkbox"/> SEMI-ENCLOSED		
35	IMPELLER CONSTR.				<input type="checkbox"/> AT EACH SUCTION, NO./CONN.		
36					<input type="checkbox"/> AT EACH STAGE, NO./STG.		
37					<input type="checkbox"/> CAST	<input type="checkbox"/> WELDED	<input type="checkbox"/> RIVETED
38	IMPELLER MATERIAL				<input type="checkbox"/> CONTINUOUS		
39					<input type="checkbox"/> INTERMITTENT		
40	SHAFT MATERIAL				SOLVENT TYPE		
41	BALANCE PISTON MATERIAL				QUANTITY, LB/MIN.		
42	SHAFT SLEEVE MATERIAL						
43					<input type="checkbox"/> SEAL BUFFER GAS CONNS.		
44	AT SEALS						
45	INTERSTAGE						
46	LABYRINTHS						
47	TYPE				<input type="checkbox"/> ROTATING	<input type="checkbox"/> STATIONARY	
48					<input type="checkbox"/> CAULKED STRIPS		
49					<input type="checkbox"/> MACHINED		
50	MATERIAL						
<b>PIPING CONNECTIONS</b>				<b>WEIGHTS</b>			
51		SIZE	CLASS	FACE	POSITION	COMPRESSOR ASSEMBLY	
52	SUCTION					LBS.	
53	DISCHARGE					ROTOR	
54						LBS.	
55						HEAVIEST LIFT FOR MAINT.	
						LBS.	
						BASEPLATE	
						LBS.	
						LUBE/SEAL OIL CONSOLE(S)	
						LBS.	

FORM NO. 135-311



# REQUISITION

CENTRIFUGAL  
COMPRESSOR

## FOSTER WHEELER ENERGY CORPORATION

PAGE 13 OF 18

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION	27-1910-1942M
SERVICE				ITEM	
1	COUPLINGS			PROCESS CAPACITY CONTROL	
2	SHAFT	LOW SPEED	HIGH SPEED	TYPE	<input type="checkbox"/> VARIABLE SPEED
3	MFR				<input type="checkbox"/> SUCTION THROTTLING
4	TYPE				<input type="checkbox"/> INLET GUIDE VANE
5	MODEL			FURN. BY	<input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER
6	LUBRICATION			CONTROL SIGNAL TYPE	
7	KEYED/HYDR.FIT				<input type="checkbox"/> MANUAL <input type="checkbox"/> AUTOMATIC
8	LTD.END FLOAT				<input type="checkbox"/> PNEUMATIC <input type="checkbox"/> ELECTRONIC
9	INSULATED			FURN. BY	<input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER
10	SPACER REQ'D.				
11					
12	MOUNTING PLATE(S)			ENGINEERING REQUIREMENTS	
13	<input type="checkbox"/> SOLEPLATES FOR	<input type="checkbox"/> COMPRESSOR		<input type="checkbox"/> LATERAL CRITICAL SPEED ANALYSIS	
14		<input type="checkbox"/> DRIVER	<input type="checkbox"/> GEAR	<input type="checkbox"/> TORSIONAL CRITICAL SPEED ANALYSIS	
15	<input type="checkbox"/> FABRICATED STEEL BASEPLATE			<input type="checkbox"/> TRANSIENT TORSIONAL ANALYSIS	
16	<input type="checkbox"/> COMMON FOR COMPR., GEAR & DRIVER			<input type="checkbox"/> REVIEW & COMMENT ON PURCHASER'S	
17	<input type="checkbox"/> UNDER COMPRESSOR ONLY			PIPING & FOUNDATION DRAWINGS	
18	<input type="checkbox"/> NON-SKID DECKPLATE			<input type="checkbox"/> METRIC UNITS ON ALL DRAWINGS	
19	<input type="checkbox"/> OPEN CONSTRUCTION			<input type="checkbox"/> SUBMIT REPORT/CERTIFICATION	
20	<input type="checkbox"/> HORIZ.POSITIONING SCREWS FOR EQUIPMENT			OF ALL SHOP TESTS	
21	<input type="checkbox"/> LEVELING JACKSCREWS FOR BASEPLATE			<input type="checkbox"/>	
22	<input type="checkbox"/> SUITABLE FOR GROUTING			<input type="checkbox"/>	
23	<input type="checkbox"/> SUITABLE FOR POINT SUPPORT				
24					
25	COMPRESSOR ACCESSORIES			ANTI-SURGE CONTROL	
26	<input type="checkbox"/> EJECTOR TYPE SEAL SYSTEM WITH			AUTOMATIC FLOW CONTROLLED BYPASS	
27	PIPING, PRESSURE CONTROLS AND			SYSTEM INCLUDING:	
28	INSTRUMENTATION			<input type="checkbox"/> FLOW SENSING ELEMENT	
29	<input type="checkbox"/> BUFFER GAS PIPING WITH PIPING,			<input type="checkbox"/> FLOW TRANSMITTER, CONTROLLER	
30	PRESSURE CONTROLS & INSTRUMENTATION			AND COMPUTING RELAYS AS REQ'D.	
31	<input type="checkbox"/> RADIAL VIBRATION PROBES WIRED TO			<input type="checkbox"/> FLOW CONTROL VALVE	
32	OSC. - DEMODULATORS IN JUNCTION BOX			<input type="checkbox"/>	
33	NO. PER RADIAL BRG.			FURN. BY	<input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER
34	MFR.				
35	<input type="checkbox"/> AXIAL POSITION PROBES WIRED TO			INSPECTION AND TESTS	
36	OSC. - DEMODULATORS IN JUNCTION BOX			COMPRESSOR	REQUIRED WITN.
37	NO. PER THRUST BRG.			SHOP INSPECTION	<input type="checkbox"/>
38	MFR.			HYDROSTATIC	<input type="checkbox"/> <input type="checkbox"/>
39	<input type="checkbox"/> ONCE-PER-REV. PHASE PROBE WIRED			HELIUM LEAK	<input type="checkbox"/> <input type="checkbox"/>
40	TQ OSC. - DEMODULATOR IN JUNCTION BOX			MECHANICAL RUN	<input type="checkbox"/> <input type="checkbox"/>
41	MFR.			MECH.RUN SPARE ROTOR	<input type="checkbox"/> <input type="checkbox"/>
42	<input type="checkbox"/> BEARING TEMP. DETECTORS WIRED			FIT IN SPARE ROTOR	<input type="checkbox"/> <input type="checkbox"/>
43	TO JUNCTION BOX			PERFORMANCE TEST (GAS) (AIR)	<input type="checkbox"/> <input type="checkbox"/>
44	<input type="checkbox"/> THERMOCOUPLES, TYPE			USE (JOB) (SHOP) DRIVER	<input type="checkbox"/>
45	<input type="checkbox"/> RTD, OHMS.			USE (JOB) (SHOP) OIL SYSTEM	<input type="checkbox"/>
46	<input type="checkbox"/> EACH RADIAL BEARING			USE JOB VIBR. & AXIAL PROBES	<input type="checkbox"/>
47	<input type="checkbox"/> EACH THRUST BEARING			SEAL LEAKAGE AT FULL PRESS.	<input type="checkbox"/> <input type="checkbox"/>
48	ACTIVE NO.	INACTIVE NO.		CHECK BRGS. & SEALS AFTER TEST	<input type="checkbox"/> <input type="checkbox"/>
49	<input type="checkbox"/> INSTRUMENT WIRING TO BE RUN IN RIGID				<input type="checkbox"/> <input type="checkbox"/>
50	CONDUIT TO JUNCTION BOX TERMINAL			LUBE & SEAL OIL SYSTEMS	
51	STRIPS BY VENDOR			OIL CONSOLE(S) OPERATIONAL TEST	<input type="checkbox"/> <input type="checkbox"/>
52	<input type="checkbox"/>			SET & CHECK ALL CONTROLS	<input type="checkbox"/> <input type="checkbox"/>
53				TRANSFER & TWO PUMP OPERATION	<input type="checkbox"/> <input type="checkbox"/>
54					<input type="checkbox"/> <input type="checkbox"/>
55					
56					

FORM NO. 135-312



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CENTRIFUGAL  
COMPRESSOR  
PAGE 14 OF 18

CHANGE NO. 2	DATE 6 Feb. 81	REQUISITION 27-1910-1942M
SERVICE	ITEM	
1	LUBE OIL SYSTEM	
2	SYSTEM REQUIREMENTS	SYSTEM COMPONENTS
3	LUBE OIL SYSTEM COMMON FOR	OIL COOLERS
4	<input type="checkbox"/> COMPRESSOR <input type="checkbox"/> DRIVER <input type="checkbox"/> GEAR	TYPE                      MFR.
5		<input type="checkbox"/> TWIN COOLERS <input type="checkbox"/> SINGLE COOLER
6	SEAL OIL SYSTEM <input type="checkbox"/> NOT REQUIRED	<input type="checkbox"/> TEMA CLASS C <input type="checkbox"/>
7	<input type="checkbox"/> COMBINED WITH LUBE <input type="checkbox"/> SEPARATE	<input type="checkbox"/> ASME CODE CONSTR. <input type="checkbox"/> CODE STAMPED
8		<input type="checkbox"/> THERMOSTATIC BYPASS TEMP. CONTROL
9	<input type="checkbox"/> DRIVER CONTROL OIL REQUIRED	TUBE SIZE                      DIA. x                      BWG
10	CONTROL OIL PRESSURE                      PSIG	TUBE MATERIAL
11		SHELL MATERIAL
12	SYSTEM COMPONENTS	WATER SIDE FOULING FACTOR
13	<input type="checkbox"/> CONSOLE MOUNTED	WATER SIDE DESIGN PRESS.                      PSIG
14	<input type="checkbox"/> ON COMPRESSOR BASEPLATE	OIL SIDE DESIGN PRESS.                      PSIG
15	<input type="checkbox"/> WEATHER-PROOF	
16	<input type="checkbox"/> NO COPPER OR COPPER BEARING ALLOYS TO BE USED	
17		TWIN OIL FILTERS
18	OIL SYSTEM TO BE IN ACCORDANCE WITH	MFR.                      MODEL
19	<input type="checkbox"/> JOB SPEC.                      -39A2	FURNISH WITH ONE SPARE SET OF CARTRIDGES
20	<input type="checkbox"/> MANUFACTURER'S STANDARD	FILTRATION                      MICRONS(NOMINAL)
21		FILTER MEDIA MATERIAL
22	PIPING TO BE IN ACCORDANCE WITH	CASING & COVER MATERIAL
23	<input type="checkbox"/> JOB SPEC.                      -39A2	DESIGN PRESSURE                      PSIG
24	<input type="checkbox"/> JOB SPEC.                      -39A3	<input type="checkbox"/> ASME CODE CONSTR. <input type="checkbox"/> CODE STAMPED
25		
26	INSTRUMENTATION AND SYSTEM TESTING REQUIREMENTS	CONTINUOUS FLOW TRANSFER VALVES
27	ARE SPECIFIED ELSEWHERE IN THIS REQUISITION.	MFR.
28		MATERIAL
29	SYSTEM COMPONENTS	<input type="checkbox"/> SEPARATE VALVES FOR COOLERS & FILTERS
30	OIL RESERVOIR	<input type="checkbox"/> SINGLE VALVE FOR COOLER & FILTER
31	LOCATION <input type="checkbox"/> CONSOLE <input type="checkbox"/> IN BASEPLATE	
32	MATERIAL <input type="checkbox"/> CARBON STL. <input type="checkbox"/> ST. STEEL	ACCUMULATORS
33	RETENTION TIME                      MINUTES	REQ'D. FOR <input type="checkbox"/> LUBE OIL, SIZE                      GAL
34	WORKING CAPACITY                      GALLONS	<input type="checkbox"/> CONTROL OIL, SIZE                      GAL
35	<input type="checkbox"/> ELECT. HEATER WITH THERMOSTAT	BLADDER MATERIAL
36	<input type="checkbox"/> REPLACEABLE STEAM COIL	SHELL MATERIAL
37		DESIGN PRESSURE                      PSIG
38		<input type="checkbox"/> ASME CODE CONSTR. <input type="checkbox"/> CODE STAMPED
39	OIL PIPING	FURNISH WITH <input type="checkbox"/> CHARGE VALVE <input type="checkbox"/> GAUGE
40	SUPPLY <input type="checkbox"/> CARBON STL. <input type="checkbox"/> ST. STEEL	
41	<input type="checkbox"/> ST. STEEL DOWNSTREAM FILTERS	COUPLING OIL FILTER
42	DRAINS <input type="checkbox"/> CARBON STL. <input type="checkbox"/> ST. STEEL	<input type="checkbox"/> SINGLE WITH BYPASS <input type="checkbox"/> TWIN
43		MFR.                      MODEL
44		FURNISH WITH ONE SPARE SET OF CARTRIDGES
45	MAIN OIL PUMP	FILTRATION                      MICRONS(NOMINAL)
46	TYPE                      MFR.	
47	<input type="checkbox"/> MOTOR DRIVER <input type="checkbox"/> TURBINE DRIVER	ELECTRICAL WIRING
48		<input type="checkbox"/> INSTR. WIRING TO INDIVIDUAL SWITCH
49	AUX. OIL PUMP	ENCLOSURES BY PURCHASER
50	TYPE                      MFR.	<input type="checkbox"/> INSTR. WIRING TO BE RUN IN RIGID CONDUIT
51	<input type="checkbox"/> MOTOR DRIVER <input type="checkbox"/> TURBINE DRIVER	TO JUNCTION BOX TERMINAL STRIPS BY
52		VENDOR
53	SEE PAGE                      FOR PUMP DATA	<input type="checkbox"/> POWER WIRING TO MOTORS BY PURCHASER
54	SEE PAGE                      FOR DRIVER DATA	
55		

FORM NO. 135-313



# REQUISITION

CENTRIFUGAL  
COMPRESSOR

## FOSTER WHEELER ENERGY CORPORATION

PAGE 15 OF 18

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION	27-1910-192M
SERVICE				ITEM	
1	SEAL OIL SYSTEM				
2	SYSTEM REQUIREMENTS		SYSTEM COMPONENTS		
3	SEAL OIL TO BE SUPPLIED FROM		OIL COOLERS		
4	<input type="checkbox"/> LUBE OIL SYSTEM		TYPE		MFR.
5	<input type="checkbox"/> SEPARATE CONSOLE TYPE SYSTEM		<input type="checkbox"/> TWIN COOLERS		<input type="checkbox"/> SINGLE COOLER
6			<input type="checkbox"/> TEMA CLASS C		<input type="checkbox"/>
7	SYSTEM COMPONENTS		<input type="checkbox"/> ASME CODE CONSTR.		<input type="checkbox"/> CODE STAMPED
8	<input type="checkbox"/> WEATHER -PROOF		<input type="checkbox"/> THERMOSTATIC BYPASS TEMP. CONTROL		
9	<input type="checkbox"/> NO COPPER OR COPPER BEARING		TUBE SIZE		DIA. x BWG
10	ALLOYS TO BE USED		TUBE MATERIAL		
11			SHELL MATERIAL		
12	SEAL OIL DIFFERENTIAL PRESS. CONTROL		WATER SIDE FOULING FACTOR		
13	<input type="checkbox"/> HYDROSTATIC HEAD (LEVEL CONTROL)		WATER SIDE DESIGN PRESS.		PSIG
14	<input type="checkbox"/> DIFF. PRESSURE CONTROLLER		OIL SIDE DESIGN PRESS.		PSIG
15					
16	NOMINAL DIFF. PRESS. AT SEALS	PSI	TWIN OIL FILTERS		
17	MAX. ALLOWABLE SEALING PRESS.	PSIA	MFR.		MODEL
18			FURNISH WITH ONE SPARE SET OF CARTRIDGES		
19	OIL SYSTEM TO BE IN ACCORDANCE WITH:		FILTRATION		MICRONS (NOMINAL)
20	<input type="checkbox"/> JOB SPEC -39A2		FILTER MEDIA MATERIAL		
21	<input type="checkbox"/> MANUFACTURER'S STANDARD		CASING & COVER MATERIAL		
22			DESIGN PRESSURE		PSIG
23	PIPING SPECS. AND WIRING REQUIREMENTS SHALL		<input type="checkbox"/> ASME CODE CONSTR.		<input type="checkbox"/> CODE STAMPED
24	BE THE SAME AS SPECIFIED FOR THE LUBE				
25	OIL SYSTEM.		CONTINUOUS FLOW TRANSFER VALVES		
26			MFR.		
27	INSTRUMENTATION AND SYSTEM TESTING		MATERIAL		
28	REQUIREMENTS ARE SPECIFIED		<input type="checkbox"/> SEPARATE VALVES FOR COOLERS & FILTERS		
29	ELSEWHERE IN THIS REQUISITION.		<input type="checkbox"/> SINGLE VALVE FOR COOLER & FILTER		
30					
31			OVERHEAD TANK		
32	SYSTEM COMPONENTS		<input type="checkbox"/> NOT REQUIRED		<input type="checkbox"/> DIRECT CONTACT TYPE
33	OIL RESERVOIR		<input type="checkbox"/> TANK PLUS BLADDER TYPE BARRIER		
34	<input type="checkbox"/> COMMON WITH LUBE OIL RESERVOIR		RUNDOWN TIME		MINUTES
35	<input type="checkbox"/> ON SEAL OIL CONSOLE		WORKING CAPACITY		GALLONS
36	MATERIAL <input type="checkbox"/> CARBON STL. <input type="checkbox"/> ST. STEEL		<input type="checkbox"/> CONNECTION FOR PURGE GAS		
37	RETRIBUTION TIME	MINUTES	MATERIAL <input type="checkbox"/> CARBON STL. <input type="checkbox"/> ST. STEEL		
38	WORKING CAPACITY	GALLONS	DESIGN PRESSURE		PSIG
39	<input type="checkbox"/> ELECT. HEATER WITH THERMOSTAT		<input type="checkbox"/> ASME CODE CONSTR.		<input type="checkbox"/> CODE STAMPED
40	<input type="checkbox"/> REPLACEABLE STEAM COIL				
41			DRAINERS FOR INNER SEAL OIL		
42			DUAL 100% CAPACITY AUTOMATIC DRAIN TRAPS		
43	SEAL OIL PUMPS		WITH LEVEL INDICATORS, VALVES AND PIPING		
44	<input type="checkbox"/> NOT REQUIRED-OIL FROM LUBE SYSTEM		ALL MOUNTED ON SEPARATE BASEPLATE.		
45	<input type="checkbox"/> REQUIRED		MFR.		
46	TYPE		MFR.		CONTROLLED BY <input type="checkbox"/> FLOAT <input type="checkbox"/> TRANSMITTER
47			<input type="checkbox"/> WITH MIST ELIMINATOR ON GAS VENT		
48	MAIN OIL PUMP DRIVER	<input type="checkbox"/> MOTOR	DESIGN PRESSURE		PSIG
49		<input type="checkbox"/> TURBINE			
50	AUX. OIL PUMP DRIVER	<input type="checkbox"/> MOTOR	DEGASSING DRUM		
51		<input type="checkbox"/> TURBINE	<input type="checkbox"/> NOT REQUIRED		<input type="checkbox"/> MOUNTED ON RESERVOIR
52			<input type="checkbox"/> ELECT. HEATER WITH THERMOSTAT		
53	SEE PAGE	FOR PUMP DATA	<input type="checkbox"/> REPLACEABLE STEAM COIL		
54	SEE PAGE	FOR DRIVER DATA	MATERIAL <input type="checkbox"/> CARBON STL. <input type="checkbox"/> ST. STEEL		
55					

FORM NO. 135-314



# REQUISITION

CENTRIFUGAL  
COMPRESSOR

## FOSTER WHEELER ENERGY CORPORATION

PAGE 16 OF 18

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION	77-1910-1942M
SERVICE				ITEM	
1	INSTRUMENTATION (PER SPEC. 1910-60A1)				
2	LOCAL INSTRUMENT PANEL		ALARM AND SHUTDOWN SWITCHES		
3	<input type="checkbox"/> REQUIRED	<input type="checkbox"/> NOT REQUIRED	EACH FUNCTION TO BE ON AN INDIVIDUAL SWITCH		
4	FURNISHED BY	<input type="checkbox"/> VENDOR	<input type="checkbox"/> PURCHASER	WITH SPDT CONTACTS.	
5	PANEL DESIGN			ALARM	TRIP
6	<input type="checkbox"/> FREE STANDING	<input type="checkbox"/> WEATHER TIGHT	LOW LUBE OIL PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/> OPEN BACK	<input type="checkbox"/> DUST TIGHT	LOW CONTROL OIL PRESS.	<input type="checkbox"/>	
8	<input type="checkbox"/> ENCLOSED WITH DOORS	<input type="checkbox"/> PURGED	LOW OIL RESERVOIR LEVEL	<input type="checkbox"/>	
9			HIGH LUBE OIL FILTER $\Delta P$	<input type="checkbox"/>	
10	PRESSURE INDICATORS		HIGH SEAL OIL FILTER $\Delta P$	<input type="checkbox"/>	
11	<input type="checkbox"/> PRESS. TRANSMITTERS W/RECEIVER GAUGES	LOW SEAL OIL (LEVEL) ( $\Delta P$ )		<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/> DIRECT READING GAUGES MOUNTED IN	HIGH SEAL OIL (LEVEL) ( $\Delta P$ )		<input type="checkbox"/>	
13	SEPARATE COMPARTMENT		LOW BUFFER GAS $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/> PANEL GAUGES FURN. BY PANEL SUPPLIER		LOW EJECTOR SEAL $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>
15			AUX. OIL PUMP RUNNING	<input type="checkbox"/>	
16	PANEL PIPING AND WIRING TO BE BROUGHT OUT TO		AUX. OIL PUMP START	<input type="checkbox"/>	
17	CONNECTIONS TERMINATING AT BULKHEAD PIPING		HIGH OIL SUPPLY TEMP.	<input type="checkbox"/>	
18	FITTINGS AND JUNCTION BOX TERMINAL STRIP.		COMPR. HIGH DISCH. TEMP.	<input type="checkbox"/>	<input type="checkbox"/>
19			COMPRESSOR VIBRATION	<input type="checkbox"/>	<input type="checkbox"/>
20	PANEL TO CONTAIN FOLLOWING ITEMS:		COMPRESSOR AXIAL POSITION	<input type="checkbox"/>	<input type="checkbox"/>
21	<input type="checkbox"/> SPEED INDICATOR		TURBINE VIBRATION	<input type="checkbox"/>	<input type="checkbox"/>
22	<input type="checkbox"/> MANUAL SPEED CONTROL STATION		TURBINE AXIAL POSITION	<input type="checkbox"/>	<input type="checkbox"/>
23	<input type="checkbox"/> STOP-START PUSH BUTTONS & AMMETER		GEAR VIBRATION	<input type="checkbox"/>	<input type="checkbox"/>
24	FOR COMPRESSOR MOTOR DRIVER		COMPRESSOR HIGH THRUST BRG. TEMP.	<input type="checkbox"/>	<input type="checkbox"/>
25	<input type="checkbox"/> VIBRATION/AXIAL POSITION MONITORS		TURBINE HIGH THRUST BRG. TEMP.	<input type="checkbox"/>	<input type="checkbox"/>
26	<input type="checkbox"/> ANNUNCIATOR		TRIP-THROTTLE VALVE CLOSED	<input type="checkbox"/>	
27	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
28					
29	INSTRUMENT CALIBRATION		CONTACTS SHALL	<input type="checkbox"/> OPEN	<input type="checkbox"/> CLOSE TO ALARM
30	<input type="checkbox"/> ENGLISH	<input type="checkbox"/> METRIC	<input type="checkbox"/> DUAL SCALE	<input type="checkbox"/> OPEN	<input type="checkbox"/> CLOSE TO TRIP
31					
32	PRESSURE GAUGES		TEMPERATURE GAUGES		
33	* LOCALLY MOUNTED	LOCAL PANEL	LOCALLY MOUNTED DIAL TYPE THERMOMETERS		
34			<input type="checkbox"/> OIL OUTLET EACH RADIAL BEARING		
35	EACH OIL PUMP DISCHARGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> OIL OUTLET EACH THRUST BEARING	
36	LUBE OIL SUPPLY, EACH LEVEL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> OIL OUTLET EACH SEAL	
37	SEAL OIL SUPPLY, EACH LEVEL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> OIL IN/OUT EACH COOLER	
38	SEAL OIL DIFFERENTIAL $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
39	LUBE OIL FILTER $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40	SEAL OIL FILTER $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>		
41	COUPLING OIL FILTER $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>	ANNUNCIATOR	
42	GOVERNOR CONTROL OIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> REQUIRED	<input type="checkbox"/> NOT REQUIRED
43	THROTTLE STEAM	<input type="checkbox"/>	<input type="checkbox"/>	FURNISHED BY	<input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER
44	FIRST STAGE STEAM	<input type="checkbox"/>	<input type="checkbox"/>	MFR	MODEL
45	EXHAUST STEAM	<input type="checkbox"/>	<input type="checkbox"/>	ENCLOSURE	NO. POINTS
46	REFERENCE GAS	<input type="checkbox"/>	<input type="checkbox"/>	SOLID STATE TYPE W/FIRST OUT INDICATION	
47	BUFFER GAS $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>		
48	EJECTOR SEAL $\Delta P$	<input type="checkbox"/>	<input type="checkbox"/>	VIBRATION/AXIAL POSITION MONITORS	
49		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> REQUIRED	<input type="checkbox"/> NOT REQUIRED
50				FURNISHED BY	<input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER
51				MOUNTED BY	<input type="checkbox"/> VENDOR <input type="checkbox"/> PURCHASER
52				LOCATION	<input type="checkbox"/> REMOTE PANEL <input type="checkbox"/> LOCAL PANEL
53				MFR	MODEL
54	* MOUNT ON GAUGE-BOARDS ON COMPRESSOR			ENCLOSURE	NO. MONITORS
55	BASEPLATE OR OIL CONSOLE AS APPLICABLE.				

FORM NO. 135-315





# REQUISITION

CENTRIFUGAL  
COMPRESSOR

## FOSTER WHEELER ENERGY CORPORATION

PAGE 17 OF 18

CHANGE NO.	2	DATE	6 Feb. 81	REQUISITION	27-1910-1942M
SERVICE					ITEM
1	UTILITIES DATA				
2	ELECTRICAL			STEAM	
3					
4	AREA CLASSIFICATION <input checked="" type="checkbox"/> NON-HAZARDOUS				
5	<input type="checkbox"/> CLASS	GROUP(S)	DIV	AUX. TURBINES, INLET	- PSIG - °F
6				EXHAUST	- PSIG -
7	MOTORS				
8	1/3 HP & SMALLER	115 V	1 PH	60 HZ	HEATING COILS 40 PSIG 310 °F
9	1/2 HP THRU 200HP	460 V	3 PH	60 HZ	
10	HP & LARGER	V	PH	HZ	EJECTORS PSIG °F
11	LBS/HR REQ'D				
12	HEATERS				
13	KW & SMALLER	V	PH	HZ	AUXILIARY TURBINES
14	KW & LARGER	V	PH	HZ	SERVICE LUBE OIL PUMP
15					
16	CONTROL POWER	115 V	1 PH	60 HZ	QUANTITY
17	MFR.				
18	SWITCH CONTACTS (5 AMP DC RATING)				
19	ALARM	<input type="checkbox"/> AC	<input type="checkbox"/> DC	V	PH HZ BHP
20	TRIP	<input type="checkbox"/> AC	<input type="checkbox"/> DC	V	PH HZ RPM
21	LB/HP-HR				
22	SWITCH ENCLOSURES	<input type="checkbox"/> NEMA 4			FLOW, LB/HR
23	<input type="checkbox"/> NEMA 7				
24					
25	AUXILIARY MOTORS			COOLING WATER	
26	SERVICE	LUBE OIL PUMP			TYPE
27	SOURCE <u>COOLING TOWER</u>				
28	QUANTITY				SUPPLY PRESS. 60 PSIG, TEMP 85 °F
29	MFR				ALLOWABLE PRESSURE DROP 25 PSI
30	TYPE				ALLOWABLE TEMPERATURE RISE 30 °F
31	ENCLOSURE				
32	HP				C.W. CONSUMPTION
33	SF				LUBE OIL COOLER GPM °F RISE
34	RPM				SEAL OIL COOLER GPM °F RISE
35					INTERCOOLERS GPM °F RISE
36					
37	INSTRUMENT AIR				
38					
39	SUPPLIED TO CONTROL DEVICES AT 100 PSIG				
40	VENDOR SHALL FURNISH FILTER REGULATOR SETS				
41					
42	NOTES				
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					

FORM NO. 135-316



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 18 OF 18

CLIENT <u>CONOCO/DOE</u>		CONTRACT <u>15-1910</u>		REQUISITION		DATE	
SITE <u>NOBLE COUNTY, OHIO</u>				<u>27-1910-1942M</u>		<u>27 AUG 80</u>	
MATERIAL <u>SQUIRREL CAGE INDUCTION MOTOR(S),</u>				C1	<u>16 DEC 80</u>	C4	
<input type="checkbox"/> HORIZONTAL <input type="checkbox"/> VERTICAL				C2	<u>6 Feb81</u>	C5	
MANUFACTURER				C3		C6	
1	ITEM(S):						
2							
3	QUANTITY						
4	DRIVEN EQUIPMENT						
5	NAMEPLATE HP						
6	SERVICE FACTOR						
7							
8	FL RPM/NO. OF POLES	/	/	/	/	/	/
9	VOLTS/PH/HZ	/	/	/	/	/	/
10	ENCLOSURE TYPE						
11	°C RISE/40°C @ SF LOAD						
12	TEMP. MEASUREMENT METHOD						
13	INSULATION CLASS						
14	THERMAL PROTECTOR TYPE						
15	NEC TEMP. IDENT. NO.						
16	FRAME SIZE NO.						
17	MOUNTING ASSEMBLY						
18	ROTATION FROM END OPP. CPLG.						
19	BEARINGS TYPE						
20	LUBRICATION						
21	NEMA LR CODE						
22	NEMA DESIGN						
23	AMPS., FL/LR	/	/	/	/	/	/
24	LOCKED ROTOR LIMIT, SECS.						
25	% EFFIC. 100%/75%/50% LOAD	/	/	/	/	/	/
26	% P.F. 100%/75%/50% LOAD	/	/	/	/	/	/
27	NOISE LEVEL (dBA @ 3 FT)						
28	SPECIAL REQUIREMENTS:						
29	MOUNT HALF-COUPLING						
30	SPACE HEATERS WATTS						
31	VOLTS/PH/HZ	/	/	/	/	/	/
32	SUITABLE FOR V-BELT DRIVE						
33	SLIDE BASE						
34							
35	WEIGHT:						
36	MOTOR & (IF APPLIC.) BASE						
37	TESTS:						
38	N.E.M.A. STD. COMMERCIAL						
39							
40	TEST CERTIFICATES REQUIRED						
41	NOTES:						
42							
43							
44							
45	APPLICABLE DOCUMENTS: (PER Pg 7)	BASIC DESIGN DATA: (PER Pg 5 & 6)					
46	MOTOR SPECIFICATION -38A8	ALTITUDE FT.					
47		AMBIENT °F MAX. °F MIN.					
48		INSTALLATION <input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR <input type="checkbox"/>					
49	PREP. FOR SHIP'T. SPEC. -97A1	ELEC. AREA <input type="checkbox"/> CL. <input type="checkbox"/> GRP(S). <input type="checkbox"/> DIV.					
50	GENERAL NOTES REQ'N. -1300A	<input type="checkbox"/> NON- HAZARDOUS					
51							
BY:		P.O.		VENDOR			

FORM NO. 135-323B



# FOSTER WHEELER ENERGY CORPORATION

110 SOUTH ORANGE AVENUE - LIVINGSTON, NEW JERSEY 07039 - PHONE 201-533-1100

Attachment 1. to Requisition 27-1910-1942M

## INSTRUMENT VENDORS LIST

All instrument items supplied must be from the following vendors, or equal:

### Control Valves

#### Air Operated

Masoneilan, Fisher Controls, Jamesbury

#### Self Actuated Temperature

Ashcroft, Leslie, Robertshaw

#### Solenoid Operated

R. G. Laurence, ASCO, Maxon Corp.

#### Special Applications

Clow, Jamesbury, Posi-Seal

### Flow

#### Differential Pressure Transmitter

Barton, Rosemount, Foxboro

#### Rotameters

Brooks, Fischer & Porter, Wallace & Tiernan

#### Magnetic

Fischer & Porter, Foxboro, Taylor

#### Turbine

Brooks, Fischer & Porter, Foxboro

#### Venturi, Flow Nozzle, Etc.

B.I.F., Daniel Industries, Vickery-Simms

#### Positive Displacement

American Meter Company, Badger Meter, Smith Geosource



Flow Switches

Barton, Magnetrol, Peeco

Flow Glasses

Brooks, Fischer & Porter, Jergusen

Level

Differential Pressure Transmitter

Foxboro, Taylor, Rosemount

Displacement

Magnetrol International, Fisher Controls, Foxboro

Gauge Glasses

Daniel Industries, Jurguson Valve & Gauge, Penberthy Houdaille

Float Switches

Magnetrol International, Fisher Controls, Delta Controls

Remote Gauge Glasses

Clark Reliance, Yarway

Pressure

Transmitters

Foxboro, Taylor, Rosemount

Local Controllers

Fisher Controls, Foxboro, Taylor

Relief Valves

Consolidated, Crosby Valve & Gauge, Farris Engineering

Rupture Discs

Ametek US Gauge Division, Frangible Discs, Black, Sivalis & Bryson

Pressure Switches

Dresser Industries Ashcroft Division, Mercoid, Custom Control Sensors

Pressure Gauges

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Crosby Valve & Gauge



Low Pressure & Vac. Relief

Protectoseal, Shand & Jurs, Varec

Pressure Differential (for filters)

Orange Research, Meriam, Midwest Instruments

Temperature

Filled Systems

Fischer & Porter, Foxboro, Taylor

Electro-Pneumatic Transducers

Masoneilan, Fisher Controls, Moore Products

Electronic Converters

Moore Industries, Transmation, Foxboro

Thermo Couples and Wells

Temtex, Tempo, Thermo Electric

Dial Thermometers

Ametek US Gauge Division, Dresser Industries Ashcroft Division,  
Palmer Instruments



# REQUISITION

Section 2700  
Wastewater Treatment

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 8

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.	A-2723	27-1910-1369A		24 OCT '80	
MATERIAL	Powdered Carbon System	No. Req'd	One (1)	C1	26-Jan-81	C4	
OR				C2		C5	
SERVICE	Powdered Carbon			C3		C6	

### I. SCOPE OF SUPPLY:

A. Vendor shall design, fabricate and deliver to the jobsite the following equipment with all accessories in accordance with this requisition and applicable standards and specifications referenced herein.

B. The powdered carbon system shall include the following items:

<u>Item No.</u>	<u>Description</u>
F-2701	Bag Filter and Exhaust Fan
FD-2701	Rotary Feeder
J-2701	Eductor
TK-2707	Storage Bin with Airslide & Blower pk'g. and Mixing Bowl

C. In addition to I.B. above the vendor shall also provide:

1. Storage bin inlet fill pipe (sch.-10 steel) with "Quick Connect" truck adaptor and shut-off slide gate.
2. Inlet and outlet piping (sch.-40 steel) for the airslide blower package and suitable duct work for the bag filter exhaust fan.
3. All necessary interconnecting chute work and equipment support steel.
4. OSHA ladder and safety cage from grade to top of storage bin. OSHA guard rail and toe board around periphery of storage bin.
5. Required access platforms with OSHA guard rails & ladders for equipment maintenance.

D. The following will be supplied by others.

1. Field erection
2. Foundations
3. Utilities
4. Field wiring and motor starters.
5. Remote Controls

FORM NO. 135-801

BY	SDM	P.O. NO.	SUPPLIER
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# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 8

CHANGE NO.: C1

DATE 26-Jan-81

REQUISITION NO. 27-1910-1369A

## II. APPLICABLE STANDARDS AND SPECIFICATIONS

- A. All equipment shall comply with the following currently approved applicable specifications, codes and standards:

### 1. Codes and Standards

AGMA - American Gear Manufacturer's Association  
AISC - American Institute of Steel Construction  
IEEE - Institute of Electrical and Electronic Engineers.  
AISI - American Iron and Steel Institute  
ASME - American Society of Mechanical Engineers.  
ASTM - American Society for Testing Materials.  
AWS - American Welding Society  
EPA - Environmental Protection Agency  
NEC - National Electrical Code  
NEMA - National Electric Manufacturer's Association  
OSHA - Federal Occupational Safety and Health Administration  
NFPA - National Fire Protection Agency  
UL - Underwriters Laboratory

### 2. FWEC Specifications

1910-1300A, General Notes for Mechanical Equipment  
1910-38A6, Low Voltage NEMA Frame TEFC & xP Induction Motors  
1910-40A1, Wind, Earthquake and Snow Loading.  
1910-40A2, Design Loadings for Equipment, Structures and Foundations.  
1910-78A4, Electrical Requirements for Packaged Systems.  
1910-83A1, Painting  
1910-97A1, Preparation for Shipment

## III. ELECTRICAL REQUIREMENTS

- A. All items located under the storage silo (TK-2707) shall be suitable for Class II, Group F, Division 1, Area. All other Areas are classified Class II, Group F, Division 2.
- B. Purchaser shall supply the following feeders only. All other voltages or sub-feeders required shall be obtained by the vendor through the use of transformers, circuit breakers, etc.
1. 480v, 3PH, 60 HZ
  2. 120v, 1PH, 60 HZ
- C. Vendor shall refer to FWEC Job Spec 1910-78A4 for complete electrical details.

## IV. INSTRUMENTATION

- A. The vendor shall furnish the following instruments:
1. Local field mounted start/stop station for automatic bag cleaning including necessary valves, solenoids, timers, and piping complete with ladder or logic flow diagrams.

FORM NO. 136-802



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 8

CHANGE NO. C1

DATE 26-Jan-81

REQUISITION NO. 27-1910-1369A

#### IV. (Cont'd)

2. Direct reading instruments i.e. pressure gauges, temperature gauges, level gauges, etc.
3. Sensors (Thermocouples, Temperature and Pressure Switches, Transmitters, etc.)
4. All actuating devices (Control Valves, Electrical and Pneumatic Positioners, Relays, etc.)

#### B. The following instruments will be furnished by others:

1. Remote Indicators and Alarms
2. Remote Controls

#### V. MATERIALS OF CONSTRUCTION

1. All equipment in direct contact with the powdered carbon shall be 316LSS except for the inside of the storage bin TK-2707.
2. The inside of storage bin TK-2707 shall be coated with a phenolic resin as specified on page 7 of 8.

#### VI. PROPOSAL REQUIREMENTS

The vendors proposal shall include the following data:

1. Itemized list of exceptions to the specifications.
2. Preliminary outline drawing (s) of system or components.
3. Equipment horse powers and weights.
4. Completion of FW data sheets.
5. Delivery





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 4 OF 8

CLIENT <b>CONOCO/DOE</b>		CONTRACT <b>15-1910</b>		REQUISITION		DATE	
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM <b>F-2701</b>		<b>27-1910-1369A</b>		<b>24-OCT-80</b>	
MATERIAL <b>BAG FILTER</b>		NO. REQ'D. <b>ONE (1)</b>		C1	<b>26-JAN-81</b>	C4	
SERVICE <b>POWDERED CARBON</b>				C2		C5	
MFR.		MODEL		C3		C6	
1 MATERIAL HANDLED				PERFORMANCE			
2 Matl. <b>POWDERED CARBON DUST</b>				Outlet Dust Loading		Grains/ACF	
3 Particle Size Distribution <b>70% MIN., -325 MESH</b>				Eff. @ Design Cap. <b>99.9</b>		%	
4 Size				Gas Vel. Thru Unit		FPM	
5 % Passing				Press. Drop Thru Unit:			
6 Density: Particle Bulk <b>21 Lb/Fr<sup>3</sup></b>				Clean Filters <b>"H<sub>2</sub>O Dirty</b>		<b>"H<sub>2</sub>O</b>	
7 Repose <b>L 30°</b> Temp. <b>AMB °F</b>				Expected Filter Life		Hrs.	
8 Moist. <b>DRY %</b> Corrosive <b>NO</b> Abrasive <b>NO</b>				<b>(4) EXHAUST FAN (QUOTE AS OPTIONAL)</b>			
9 Flowability <b>AGITATION REQ'D.</b> Flammability <b>400°C DUST IGN</b>				<input checked="" type="checkbox"/> Gear Reducer: Mfr <b>FAK OR EQ.</b> Model			
10 Explosion Severity <b>WEAK</b> Index				Rated HP		<b>AGMA SF 1.5</b>	
11 Toxic Fumes or Dust <b>NO</b>				RPM In/Out <b>/</b>		Lubrication <b>OIL</b>	
12 OPERATING CONDITIONS				<input type="checkbox"/> Couplings Type Mfr			
13 Capacity Design/Max <b>1000 / 1000 (1) ACFM</b>				<input type="checkbox"/> Chain <input checked="" type="checkbox"/> Belt <input type="checkbox"/> Direct RPM In/Out <b>/</b>			
14 Gas Handled <b>AIR - CARBON DUST</b>				<input checked="" type="checkbox"/> Drive Guards (Removable Rigid Steel)			
15 Inlet Press/Vac <b>2-3 PSIG (D)</b> Temp. <b>100 °F</b>				Motor By		<input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others	
16 Inlet Dust Loading <b>NOT REQ'D.</b> Grains/ACF				HP <b>SF 1.15</b> RPM		Frame	
17 Duty <input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intmt <b>2-3 HRS/DELIVERY</b>				<b>460 V, 3 PH, 60 HZ Encl. DUST IGN. PR,</b>			
18 CONSTRUCTION DETAILS				Type		Mfr.	
19 Active Air/Cloth Ratio <b>2:1 OR LESS</b>				Insul. Cl.		Brg's <b>BALL</b> Lube <b>GREASE</b>	
20 Casing (Less Hopper)				Rise °C		FL Amps LR Amps	
21 Width Lgth Height				AUXILIARIES			
22 Matl. Thk.				<input type="checkbox"/> Disch. Feeder, See Page			
23 No. of Compartments				<input type="checkbox"/> Disch. Conveyor, See Page			
24 Duct Size: Inlet Outlet				<input checked="" type="checkbox"/> Timer <input checked="" type="checkbox"/> Press. Diff. Switches			
25 <input type="checkbox"/> Inlet Baffle Pl. Thk.				<input checked="" type="checkbox"/> EXHAUST FAN <b>(QUOTE SEPARATELY)</b>			
26 Filter Media <input checked="" type="checkbox"/> Grounded				<input checked="" type="checkbox"/> Walkways, Rails, Ladder & SAFETY CAGE: OSHA TYPE			
27 Matl. <b>SILICONIZED DACRON</b> Thk.				<input type="checkbox"/> Explosion Relief Latches			
28 No. Req'd. Dia./Width Lgth				<input checked="" type="checkbox"/> Prewired Control Panels <b>(QUOTE AS A SEPARATE ITEM)</b>			
29 Filter Area: Total SF Net SF				SHOP TESTS		REQ'D	
30 Net Wt./Bag Lb. Des. Temp. °F				Mech. Run Drive		<input type="checkbox"/>	
31 Removal <input checked="" type="checkbox"/> Top <input type="checkbox"/> Inside Casing						<input type="checkbox"/>	
32 Method of Fastening						<input type="checkbox"/>	
33 Cleaning Device <input checked="" type="checkbox"/> Auto <input type="checkbox"/> Semi <input type="checkbox"/> Manual				SITE DATA			
34 <input type="checkbox"/> Shaker Type				Ambient <b>100</b> °F Max. to <b>-10</b> °F Min			
35 <input checked="" type="checkbox"/> Reverse - Air Jet				Installed <input type="checkbox"/> Indoors <input checked="" type="checkbox"/> Outdoors			
36 Comp. Air Req'd. SCFM @ PSIG				CI <input checked="" type="checkbox"/> Gr <b>F</b> Div <b>2</b>		<input type="checkbox"/> Non-Hazardous	
37 Cleaning Interval Duration				Altitude @ Gr. Above Sea Level Ft.			
38 No. of Bags Cleaned/Interval				UTILITIES AVAILABLE			
39 <input type="checkbox"/> Dust Hopper <input checked="" type="checkbox"/> Single <input type="checkbox"/> Multiple Qty--				Air @ <b>100</b> PSIG <b>100</b> °F			
40 Matl. Thk.				Electricity <b>480/120</b> V, <b>3/1</b> PH, <b>60</b> HZ			
41 Outlet Opng. Width Lgth				APPLICABLE DOCUMENTS			
42 Vert. Height Slope <b>0</b>				REFER TO <b>PAGE 2 OF 8</b>			
43 Support Legs <b>(3)</b> By <input type="checkbox"/> Vendor <input type="checkbox"/> Others							
44 Column Size Qty.							
45 Lgth Below/Above Hopper Disch. Ft.							
46 Total Weight Lbs.							
47 NOTES				① THESE CONDITIONS REPRESENT THE UNLOADING CAPABILITIES OF THE			
48				"PD" DELIVERY TRUCKS.			
49				② DIRECT DISCHARGE TO TK-2707.			
50				③ CASING TO BOLT DIRECTLY TO TK-2707			
51				④ PLANT AIR (BY OTHERS) TO BE USED FOR BAG CLEANING.			
BY <b>2PM</b>		P.O.		VENDOR			

FORM NO. 135-355



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF 8

CLIENT CONDCO / DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE NOBLE COUNTY, OHIO		ITEM NO. FD-2701		27-1910-1369A		24-OCT-86	
MATERIAL ROTARY FEEDER		NO. REQ'D ONE (1)		C1	26-JAN-81	C4	
SERVICE POWDERED CARBON		C2		C5			
MFR.		MODEL		C3		C6	
1 MATERIAL HANDLED				PERFORMANCE			
2 Mat'l. POWDERED CARBON				BHP @ Head Shaft		Drive Eff %	
3 Nom Particle Size 70% MIN., -325 MESH				Oper. Speed RPM		Max. Cap. STPH	
4 Nom Bulk Density 21 LBS. PER CU. FT.				Volumetric Displacement		Ft Rev.	
5 Angle of Repose 30°				Leakage Rate @ Δ P Idle		ACFM	
6 Temperature AMB. °F Moisture DRY %				Operating		ACFM	
7 Abrasive NO Corrosive NO				DRIVE			
8 Flowability AGITATION REQ'D Flammability 400°C DUST IGN.				<input checked="" type="checkbox"/> Constant Speed		<input type="checkbox"/> Variable Speed	
9 Explosion Severity WEAK Index				<input checked="" type="checkbox"/> AC <input type="checkbox"/> DC		<input type="checkbox"/>	
10 Toxic Fumes or Dust NO				<input type="checkbox"/> Auto. Reversible @ High Torque			
11				<input checked="" type="checkbox"/> Gear Reducer: Mfr. FALK or EQ. Model			
12 OPERATING CONDITIONS				Rated HP		AGMA SF 1.5	
13 Capacity (Lbs/Hr) 200 75% Full -100% Full				RPM In/Out /		Lubrication OIL	
14 <input type="checkbox"/> Continuous Duty <input checked="" type="checkbox"/> Intermittent Duty (CONTROLS BY OTHERS)				<input type="checkbox"/> Couplings Type		Mfr.	
15 Design Temp AMB °F Hrs Per Day 1-7				<input checked="" type="checkbox"/> Chain <input type="checkbox"/> Belt <input type="checkbox"/> Direct		RPM In/Out /	
16 Press. @ Inlet 2-30 PSIG @ Outlet				PSIG		<input checked="" type="checkbox"/> Drive Guards (Removable Rigid Steel)	
17 Design Diff. Press. Δ P				PSI		<input type="checkbox"/>	
18 Fed From TK-2707				By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others			
19 Disch To 3-2701				By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others			
20				Motor By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others			
21 CONSTRUCTION DETAILS				HP		SF 1.15 RPM Frame	
22 Type <input checked="" type="checkbox"/> Drop-Thru <input type="checkbox"/> Blow-Thru				460 V. 3 PH. 60HZ		Encl. DUST IGL PR.	
23 Casing Mat'l. 316 LSS Des. Press.				PSIG		Type INDUCTION Mfr.	
24 <input type="checkbox"/> Harden Bore BHN				Insul. Cl.		Brg's. BALL Lube GREASE	
25 Flg. Conn. Inlet In. <input type="checkbox"/> Rd. <input type="checkbox"/> Sq.				Rise °C		FL Amps LR Amps	
26 Outlet In. <input type="checkbox"/> Rd. <input type="checkbox"/> Sq.				AUXILIARIES			
27 <input checked="" type="checkbox"/> Vent Conn. In. <input checked="" type="checkbox"/> Purge Conn. In.				<input type="checkbox"/> Zero Speed Switch			
28 <input checked="" type="checkbox"/> Removable End Pl. Gasket Mat'l.				Location			
29 <input checked="" type="checkbox"/> Inlet Shear Pl BHN				<input checked="" type="checkbox"/> Inlet Adapter, Size FLG. CONN. TO AIRSLIDE OUTLET			
30 <input type="checkbox"/> Even Continuous Disch. Feature				<input checked="" type="checkbox"/> Outlet Adapter, Size FLG. CONN. TO MIXING BOWL.			
31 <input checked="" type="checkbox"/> Service Door				<input checked="" type="checkbox"/> INLET & OUTLET MANUAL SLIDE GATE ISOLATION VALVES. DEZURIK OR EQUIV.			
32 Rotor <input type="checkbox"/> Closed End <input checked="" type="checkbox"/> Open End				* MAT'L 316 LSS			
33 Mat'l. 316 LSS BHN				SHOP TESTS		REQ'D WITNESSED	
34 Dia. Lth. No. of Pockets				Mech. Run		<input checked="" type="checkbox"/> <input type="checkbox"/>	
35 <input checked="" type="checkbox"/> Wiper Tips (BEVELED)						<input type="checkbox"/> <input type="checkbox"/>	
36 Mat'l. BHN No/Blade							
37 <input type="checkbox"/> Peripheral Seal Mat'l.				SITE DATA			
38 Shaft Mat'l. 316 LSS Dia. In.				Ambient 100 °F Max. to		-10 °F Min.	
39 Brgs. Type B-10 Life Hrs.				Installed <input type="checkbox"/> Indoors		<input checked="" type="checkbox"/> Outdoors	
40 <input checked="" type="checkbox"/> Greasable <input type="checkbox"/> Perme-Greased				<input checked="" type="checkbox"/> CI II Gr F		Div 1 <input type="checkbox"/> Non-Hazardous	
41 Seal Mat'l. & Constr.				Altitude (Ft.)			
42 <input checked="" type="checkbox"/> Shear Pin Design, Torque				UTILITIES AVAILABLE			
43 Total Weight Lbs.				Air @ 100 PSIG		100 °F	
44				Electricity 480/120 V. 3/1		PH. 60 HZ	
45				APPLICABLE DOCUMENTS			
46				REFER TO PAGE 2 OF 8			
47							
48							
49							
50							
51							
BY SDM		P. O. NO.		VENDOR			

FORM NO. 135-350

NOTES



# REQUISITION

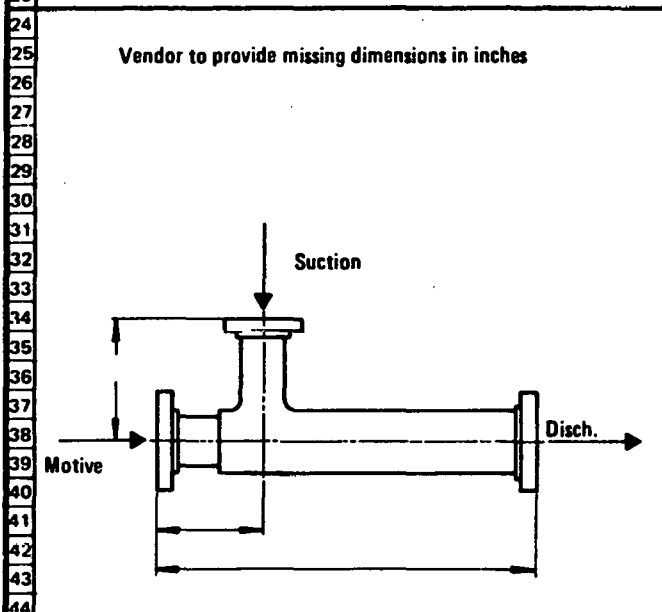
## FOSTER WHEELER ENERGY CORPORATION PAGE 6 OF 8

CLIENT <b>CONOCO/DOE</b>	CONTRACT NO. <b>15-1910</b>	REQUISITION NO.	DATE
SITE <b>NOBLE COUNTY, OHIO</b>	ITEM NO. <b>J-2701</b>	<b>27-1910-1369A</b>	<b>24-OCT-80</b>
MATERIAL <b>EDUCTOR</b>	NO. REQ'D. <b>ONE (1)</b>	C1 <b>26 JAN-81</b>	C4
SERVICE <b>POWDERED CARBON</b>		C2	C5
MFR.	MODEL	C3	C6

1	<b>MATERIAL HANDLED</b>	<b>CONSTRUCTION DETAILS</b>	
2	Material <b>POWDERED CARBON SLURRY</b>	Design Press. PSIG; Temp. °F	
3	Flow Rate <b>200 lbs. CARBON/HR. (1)</b>	Test Press. PSIG	
4	Particle Size <b>70 TO MIN., - 32.5 MESH.</b>	Size	
5	Bulk Density <b>21 LBS. PER CU. FT.</b>	Diffuser Throat: Dia. In. <input type="checkbox"/> Removable	
6	Moisture Content <b>DRY</b> %	Material	
7	Abrasive <b>NO</b> Corrosive <b>YES (GALVANIC ACTION)</b>	Nozzle: Size In.; No. Req'd.	
8	Molecular Weight	<input type="checkbox"/> Adjustable <input type="checkbox"/> Removable	
9	Viscosity	Material	
10	Suction Press. Temp. <b>AMB.</b> °F	Body: Size In.; Material <b>316LSS</b>	
11	Discharge Press. <b>20 PSIG REQ'D.</b> Temp. <b>AMB.</b> °F	Weight Lbs.	

12		<b>CONNECTIONS</b>	<b>SIZE</b>	<b>RATING</b>
13		Motive Fluid Inlet		
14	<b>MOTIVE FLUID</b>	Suction		
15	Fluid Name <b>WATER</b>	Discharge		
16	Fluid Flow Rate Lb/Hr.			
17	Duty <input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Intermittent <b>(1)</b>			

18	Temp. <b>70 °F</b> <b>100 °F</b> Max.	<b>AUXILIARIES</b>		
19	Press. <b>60 PSIG Min.</b> <b>75 PSIG Max.</b>	<input type="checkbox"/> Isolating Valves At Suction/Discharge		
20	Operating Pressure <b>60 PSIG</b> PSIG	<input type="checkbox"/> Isolating Valve At Motive Fluid Inlet		
21	Density <b>62.4 LB/FT³</b> Viscosity <b>1.1 CSK.</b>	<input checked="" type="checkbox"/> Interconnecting Piping <b>INLET CONN. TO MIXING BOWL *</b>		
22	Molecular Weight	<input type="checkbox"/> Pressure Conn. At Suction/Discharge		
23		<input type="checkbox"/> Steam Jacket		



<input type="checkbox"/> Insulations		
<input type="checkbox"/> Silencer		
<input type="checkbox"/>		
<b>* MAT'L. 316LSS</b>		
<b>SITE DATA</b>		
Ambient <b>100 °F</b> Max. to <b>-10 °F</b> Min.		
Installed <input type="checkbox"/> Indoors <input checked="" type="checkbox"/> Outdoors		
Cl. <b>I</b> Gr. <b>D</b> Div. <b>2</b> <input type="checkbox"/> Non-Hazardous		
Altitude Above Sea Level		Ft.

<b>SHOP TESTS</b>	<b>REQ'D</b>	<b>WITNESSED</b>
Hydrotest	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Performance/Noise Test	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

**APPLICABLE DOCUMENTS**  
**REFER TO PAGE 2 OF 8**

- NOTES
- ① "ON-OFF" OPERATION (CONTROLS BY OTHERS)
  - ② WINTERIZATION SHALL BE AIR BLOWING THE LINE AFTER USE.
  - ③ VENDOR TO COMPLETE DATA SHEET.

BY **2B-M** P. O. NO. VENDOR

FORM NO. 135-369



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF 8

CLIENT <b>CONOCO / DOE</b>	CONTRACT NO. <b>15-1910</b>	REQUISITION NO.	DATE
SITE <b>NOBLE COUNTY, OHIO</b>	ITEM NO. <b>TK-2707</b>	<b>27-1910-1369A</b>	<b>24-OCT-80</b>
MATERIAL <b>BIN/HOPPER</b>	NO. REQ'D. <b>ONE (1)</b>	C1 <b>26-JAN-81</b>	C4
SERVICE <b>POWDERED CARBON STORAGE</b>		C2	C5
MFR.	MODEL	C3	C6

1	MATERIAL HANDLED	CONSTRUCTION DETAILS
2	Material <b>POWDERED CARBON</b>	Design Press. _____ Test Press. _____ PSIG
3	Nom. Particle Size <b>70% MIN., - 325 MESH.</b>	Design Temp. _____ °F
4	Nom. Bulk Density <b>21 LBS. PER CU. FT.</b>	Shell Mat'l. <b>ASTM-A36 STL. (4) Thk.</b>
5	Angle of Repose <b>30°</b> Moisture <b>DRY</b> %	Bottom Mat'l. <b>ASTM-A36 STL. (4) Thk.</b>
6	Abrasive <b>NO</b> Corrosive <b>NO</b>	Roof Mat'l. <b>ASTM-A36 STL. (4) Thk.</b>
7	Flowability <b>REQUIRES FLUIDIZING AIR OR VIBRATION</b>	<input checked="" type="checkbox"/> Flat <b>GRIT COATED</b>
8	Explosion Severity <b>WEAK</b> Index	Cone Slope <b>60°</b>
9	Toxic Fumes or Dust <b>NO</b> FLAMMABILITY-400°C DUST IGN.	Corrosion Allowance <b>1/8"</b>
10	OPERATING CONDITIONS	<input checked="" type="checkbox"/> <b>AIR SLIDE BLOWER PKG. (VENDOR STD.)</b>
11	Capacity <b>2643 FT<sup>3</sup> (ACTIVE)</b> <b>27 3/4</b> ST	<input checked="" type="checkbox"/> <b>INLET &amp; OUTLET SILENCERS</b>
12	Filling <input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Batch	<input checked="" type="checkbox"/> <b>MOTOR, 460 V. 3 PH. 60 HZ. ENCL. DUST KN. PR.</b>
13	From <b>PD-TRUCKS</b> By <input type="checkbox"/> Vendor <input checked="" type="checkbox"/> Others	<b>HP. SF. 1.15" RPM: FRAME:</b>
14	Discharge <b>AIR SLIDE</b> <input type="checkbox"/> Continuous <input checked="" type="checkbox"/> Batch <b>(1)</b>	<b>TYPE: INDUCTION MFR.</b>
15	To <b>ROTARY FDR (FD-2701)</b> By <input checked="" type="checkbox"/> Vendor <input type="checkbox"/> Others	<b>LUBE: GREASE BRGS. BALL</b>
16	Operating Press. <b>2-3 (2)</b> PSIG Temp. <b>AMB</b> °F	<input checked="" type="checkbox"/> <b>Support - Type TOTALLY ENCL. SKIRTS TO GRADE (3)</b>
17	SITE DATA	<input checked="" type="checkbox"/> <b>Platform/Ladder OSHA TYPE</b> <input checked="" type="checkbox"/> <b>INTERIOR MAINT. PLATFORM.</b>
18	Ambient <b>100</b> °F Max. To <b>-10</b> °F Min.	<input checked="" type="checkbox"/> <b>MIXING BOWL MATL. 3/16 LSS, 150# FLYS.</b>
19	Installed <input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor	Total Weight (Empty) _____
20	Cl. <b>II</b> Gr. <b>F</b> Div. <b>I</b> <input type="checkbox"/> Non-Hazardous	APPLICABLE DOCUMENTS
21	Altitude @ Grade _____ Ft.	<input checked="" type="checkbox"/> <b>REFER TO PAGE 2 OF 8</b>

22	SHOP TESTS	REQ'D	WITNESSED
23	Hydro-Test	<input type="checkbox"/>	<input type="checkbox"/>
24	X-Ray (Spot/100%)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
25		<input type="checkbox"/>	<input type="checkbox"/>

CONNECTIONS (SEE NEXT PAGE)				
Item No.	No. Req'd.	Size In.	Flange Rating	Service
1	ONE			<b>FILL NOZZLE PIPE</b>
2	ONE			<b>COMBINATION MANWAY</b>
3				<b>PRES. &amp; VACC. Relief</b>
4	ONE			<b>FILTER DISCHARGE</b>
5	TWO			<b>LEVEL CONNS.</b>
6	ONE			<b>CONE ACCESS MANWAY</b>
7	ONE			<b>AIRSLIDE DISCHARGE</b>
8				
9				
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11				
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14				
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18				

26	<p>REFER TO PAGE 8 OF 8 FOR SYSTEM SKETCH.</p>
27	
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46	NOTES
47	(1) 1-7 HRS. PER DAY.
48	(2) REPRESENTS UNLOADING CAPABILITIES OF THE "PD" DELIVERY TRUCKS.
49	(3) PROVIDE LOUVERED TYPE ACCESS DOOR AND LOUVERED SKIRT VENTS.
50	(4) INSIDE OF STORAGE BIN SHALL BE COATED WITH 10 MILS (DRY) OF PLASITE 7155 HB OR EQUAL.
51	
BY <b>SDM</b>	P. O. NO.
	VENDOR

FORM NO. 135-365



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

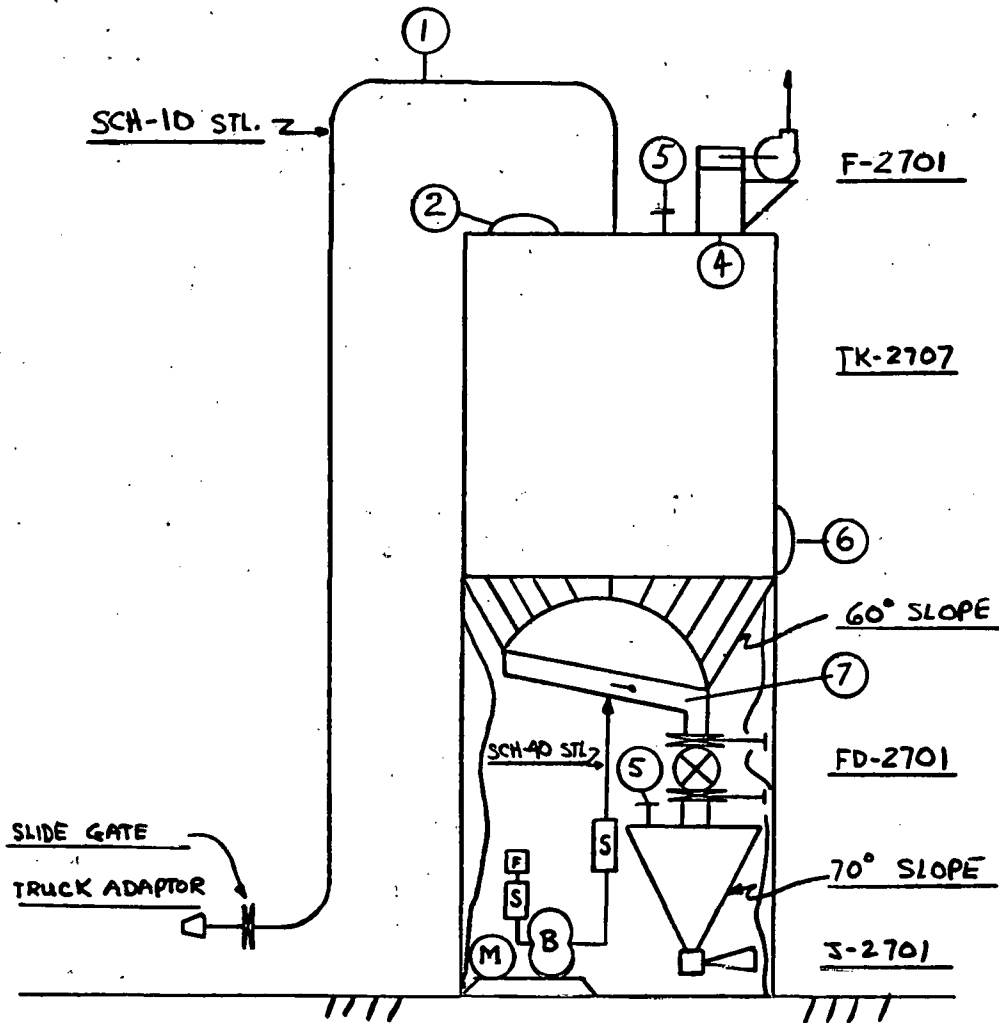
PAGE 8 OF 8

CHANGE NO. C1

DATE 26-JAN-81

REQUISITION NO. 27-1910-1369A

## SYSTEM SKETCH



FORM NO. 135-802

**18.8 INSTRUMENT LIST**

CONTRACT: 15-1910 CONOCO/DOE  
INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81

CODE OF ACCOUNTS:

INSTRUMENTS	CODE	CONTROL VALVES	CODE	SAFETY VALVES	CODE
TEMP. INST.	1611	TEMP CONTROL VALVES	1621	CONVENTL. AND BELLOWS	1631
FLW INST.	1612	FLOW CONTROL VALVES	1622	THERMAL EXPANSION	1632
LEVEL INST.	1613	LEVEL CONTROL VALVES	1623	MISC. SAFETY VALVES	1639
PRESS INST.	1614	PRESS. CONTROL VALVES	1624		
PANEL MTD INSTRUMENTS	1615	HAND CONTROL VALVES	1625	CONTROL PANELS	CODE
ANALYZERS	1616	MOTOR OPER. VALVES	1626	PREFABRICATED	1641
MULTIPLEXER SYSTEM	1617	SLIDE VALVES	1627	FIELD ASSEMBLED	1642
MISC. INSTRUMENTS	1619	SOLENOID OPER. VALVES	1628	CONSOLE DESK	1643
		MISC. CONTROL VALVES	1629		

REQUISITION NUMBERS OTHER THAN 1600 SERIES INDICATES INSTRUMENT FURNISHED BY OTHERS.  
"X" UNDER REQ NO INDICATES EXISTING INSTRUMENTS.

UNDER LOCN : F - FIELD  
P - PANEL, PL - LOCAL PANEL, PB - BOILER PANEL, PR - BACK OF PANEL  
RK - RACK

DRAWING NUMBERS, SHOWN IN THE INDEX, ARE ONLY THE LAST THREE DIGITS OF A COMPLETE DRAWING NUMBER. COMPLETE DRAWING NUMBERS ARE CONSTRUCTED AS FOLLOWS:

UNDER PROC DET.:      1910 - (DRAWING SIZE) - 65 - (NUMBER)  
UNDER AIR PIPG DET.:    1910 - (DRAWING SIZE) - 65 - (NUMBER)  
UNDER ELEC DIAG:      1910 - (DRAWING SIZE) - 76 OR 79 - (NUMBER)  
UNDER WINT DET:        1910 - (DRAWING SIZE) - 65 - (NUMBER)  
UNDER PIPG DWG. ISO.:   1910 - (DRAWING SIZE) - 51 OR 52 OR 56 - (NUMBER)  
UNDER INSTR LOCN PLAN: 1910 - (DRAWING SIZE) - 55 - (NUMBER)

REMARKS: SEE NEXT PAGE

**GENERAL REMARKS**

---

A. ITEMS IN THIS INDEX ARE GROUPED BY MEASURING OR INITIATING VARIABLE UNDER THE FOLLOWING HEADINGS:

ANALYSIS  
FLOW  
HAND  
LEVEL  
PRESSURE  
TEMPERATURE  
MISCELLANEOUS

B. ITEMS ARE INDEXED BY LOOP UNDER THE MAJOR VARIABLE FOR THE LOOP. EXAMPLE: A HAND SWITCH "HS" IN A FLOW LOOP WOULD NOT BE INDEXED UNDER "HAND" BUT WOULD APPEAR WITH ITS ASSOCIATED FLOW LOOP UNDER "FLOW".

C. ITEMS WITH NON-I.S.A. TAGS ARE STILL INDEXED UNDER THE APPROPRIATE VARIABLE. EXAMPLE: RESTRICTION ORIFICE "RO" IS INDEXED UNDER "FLOW" AND RUPTURE DISC "RD" IS INDEXED UNDER "PRESS".

D. PIPING LINE NUMBERS HAVE BEEN ABBREVIATED BY LEAVING OUT THE SECTION DESIGNATION. EXAMPLE: 4P011201A APPEARS AS 4P1201A.

**SPECIFIC NOTES**

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NOTE-1 NOT AN INSTRUMENT ITEM. TAG NUMBER DENOTES A FUNCTION WITHIN THE DISTRIBUTED CONTROL SYSTEM.  
REQUISITION 32-1910-1615-A

NOTE-2 ITEM IS PART OF CONTROL VALVE ASSEMBLY.  
(REFER TO ASSOCIATED CONTROL VALVE FOR ADDITIONAL INFORMATION)

NOTE-3 ITEM IS PART OF LURGI SCOPE OF SUPPLY

NOTE-4 ITEM IS PART OF BRITISH GAS SCOPE OF SUPPLY.

NOTE-5 ITEM IS PART OF VENDOR PACKAGE. REQUISITION NUMBER TO BE ADDED IN PHASE II.



NOTE-6 ITEM IS PART OF BURNER MANAGEMENT SYSTEM  
REQUISITION 32-1910-1615-C

NOTE-7 ITEM IS TO BE BULK ORDERED BY ELECTRICAL DEPT.

NOTE-8 NOT AN INSTRUMENT ITEM. TAG NUMBER DENOTES A FUNCTION  
WITHIN HARD WIRED ANNUNCIATOR SYSTEM.  
REQUISITION 32-1910-1615-B

NOTE-9 ITEM IS PART OF TOXIC GAS DETECTION & ALARM SYSTEM.  
REQUISITION 32-1910-1616-Y

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
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FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -ANALYZ      SHEET NUMBER 001

R E V	A R E A	TAG NUMBER LINE NUMBER	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DIAG DET.	ELEC WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
		27 AAH - 2701 A-2707	EQUALIZATION BASIN PH	P	1	NOTE-1							
		27 AAL - 2701 A-2707	EQUALIZATION BASIN PH	P	1	NOTE-1							
		27 AE - 2701 A-2707	EQUALIZATION BASIN PH	F	1	1616-K							
		27 AIC - 2701 A-2707	EQUALIZATION BASIN PH	P	1	NOTE-1							
		27 AT - 2701 A-2707	EQUALIZATION BASIN PH	F	1	1616-K							
		27 AY - 2701-A A-2707	EQUALIZATION BASIN PH	F	1	1619-A							I/P 4-20MA SPLIT R ACID CONTROL
		27 AY - 2701-B A-2707	EQUALIZATION BASIN PH	F	1	1619-A							I/P 4-20MA SPLIT R ALKALI CONTROL
		27 AAH - 2741	EVAP. SYSTEM PH	P	5	NOTE-1							
		27 AAL - 2741	EVAP. SYSTEM PH	P	5	NOTE-1							
		27 AE - 2741	EVAP. SYSTEM PH	F	5	1616-K							
		27 AIC - 2741 A-2722	EVAP. SYSTEM PH	P	5	NOTE-1							CONTROLS PUMP P-2733
		27 AT - 2741 A-2722	EVAP. SYSTEM PH	F	5	1616-K							
		27 AAH - 2742	EVAP. SYSTEM CONDUCT	P	5	NOTE-1							
		27 AE - 2742	EVAP. SYSTEM CONDUCT			1616-L							

210

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -ANALYZ      SHEET NUMBER 002

R E V	A R E L I N E N U M B E R	TAG NUMBER E LINE NUMBER	SERVICE	LOCN	EFD	REQ NO P.O. NO.	VENDOR NAME	PROC AIR DET.	ELEC PIPG DIAG DET.	WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
	27	A1 - 2742	EVAP. SYSTEM CONDUCT	P	5								NOTE-1
	27	ASOV - 2742 A-2722	EVAP. SYSTEM CONDUCT	F	5								NOTE-5 VENDOR
	27	AT - 2742 A-2722	EVAP. SYSTEM CONDUCT	F	5								NOTE-5 -
	27	AAH - 2743 A-2722	EVAP. DENSITY	P	5								NOTE-1
	27	AAL - 2743 A-2722	EVAP. DENSITY	P	5								NOTE-1
	27	AE - 2743	EVAP. DENSITY										1616-N -
	27	AIC - 2743 A-2722	EVAP. DENSITY	P	5								NOTE-1
	27	AT - 2743 A-2722	EVAP. DENSITY	F	5								NOTE-5 -
	27	AV - 2743 A-2722	EVAP. DENSITY	F	5								NOTE-5 VENDOR

211

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY COR  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -FLOW      SHEET NUMBER 003

REV	LINE NUMBER	DESCRIPTION	LOCN	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG ISO.	INSTR PLAN	REMARKS
27	FE - 2701 4A0219LC	AIR FROM B-2704C/D TO EQUALIZATION BASIN	F 1	1612-B								
27	FI - 2701	AIR FROM B-2704C/D TO EQUALIZATION BASIN	P 1	1612-K								
27	FI - 2702	INST AIR TO LT-2706 ACID DAY DRUM	F 1	1612-E								INTEGRAL ROTAMETER & CONTROL VALVE
27	FI - 2703	INST AIR TO LT-2708 CAUSTIC DAY DRUM	F 1	1612-E								INTEGRAL ROTAMETER & CONTROL VALVE
27	FE - 2704 4HW0117LC	EQUALIZATION BASIN EFFLUENT TO S-2702AB	F 1	1612-B								
27	FI - 2704	EQUALIZATION BASIN EFFLUENT TO S-2702AB	P 1	NOTE-1								RESET BY LIC-2704
27	FT - 2704 4HW0117LC	EQUALIZATION BASIN EFFLUENT TO S-2702AB	F 1	1612-A								
27	FV - 2704 4HW0117LC	EQUALIZATION BASIN EFFLUENT TO S-2702AB	F 1	1622-A								
27	FY - 2704	EQUALIZATION BASIN EFFLUENT TO S-2702AB	F 1	1619-A								1/P
27	FI - 2711	INST AIR TO LEVEL TRANS LT-2717	F 2	1612-E								INTEGRAL ROTAMETER CONTROL VALVE
27	FE - 2712 4HW0117LC	EQUALIZATION EFFLUENT	F 2	1612-G								VENTURI
27	FI - 2712 4HW0117LC	EQUALIZATION EFFLUENT	F 2	1612-K								
27	FE - 2713 4HW0201LC	EQUALIZATION EFFLUENT	F 2	1612-G								VENTURI
27	FI - 2713 4HW0201LC	EQUALIZATION EFFLUENT	F 2	1612-K								

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY COR  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -FLOW      SHEET NUMBER 004

R E V	A R E L I N E N U M B E R	TAG NUMBER E LINE NUMBER A	SERVICE	LOCN EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG OWG ISO.	INSTR LOCN PLAN	REMARKS
	27	F1 - 2714 1MU0212LC	POWERS POWERED CARBON EDUCATOR	F 2	1612-E								INTEGRAL ROTAMETER CONTROL VALVE
	27	F1 - 2715 1MU0210LC	POLYMER WATER CONTROL	F 2	1612-E								ROTAMETER & INTEGRAL CONTROL VALVE
	27	FE - 2716	DISOLVED AIR FLOTATION SYSTEM (A)	F 2	NOTE-5								VENDOR
	27	F1 - 2716	DISOLVED AIR FLOTATION SYSTEM (A)	P 2	NOTE-1								
	27	FIC - 2716	DISOLVED AIR FLOTATION SYSTEM (A)	F 2	NOTE-1								
	27	FT - 2716	DISOLVED AIR FLOTATION SYSTEM (A)	F 2	NOTE-5								VENDOR
	27	FV - 2716	DISOLVED AIR FLOTATION SYSTEM (A)	F 2	NOTE-5								VENDOR
	27	FY - 2716	DISOLVED AIR FLOTATION SYSTEM (A)	F 2	NOTE-5								VENDOR P/I
	27	FE - 2717	DISOLVED AIR FLOTATION SYSTEM (B)	F 2	NOTE-5								VENDOR
	27	F1 - 2717	DISOLVED AIR FLOTATION SYSTEM (B)	P 2	NOTE-1								
	27	FIC - 2717	DISOLVED AIR FLOTATION SYSTEM (B)	F 2	NOTE-5								VENDOR
	27	FT - 2717	DISOLVED AIR FLOTATION SYSTEM (B)	F 2	NOTE-5								VENDOR
	27	FV - 2717	DISOLVED AIR FLOTATION SYSTEM (B)	F 2	NOTE-5								VENDOR
	27	FY - 2717	DISOLVED AIR FLOTATION SYSTEM (B)	F 2	NOTE-5								VENDOR P/I

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -FLOW      SHEET NUMBER 005

REV	DESCRIPTION	SERVICE	LOCN	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG ISO.	INSTR PLAN	REMARKS
27 FE	- 2718 6AP0229LC	AIR TO AERATION BASIN DIFFUSION SYS.	F 2	1612-B								
27 FI	- 2718 6AP0229LC	AIR TO AERATION BASIN DIFFUSION SYS.	F 2	1612-K								
27 FI	- 2720 S-2702A	PLANT AIR TO DISOLVE AIR FLOTATION SYS.	F 2	NOTE-5								ROTAMETER & INTEGRAL CONTROL VALVE-VENDOR
27 FI	- 2721 S-2702B	PLANT AIR TO DISOLVE AIR FLUTATION SYS.	F 2	NOTE-5								ROTAMETER & INTEGRAL CONTROL VALVE-VENDOR
27 FI	- 2731 1NU0304LC	H2O METERING TO POLYMER FEED SYS	F 3	1612-E								ROTAMETER & INTEGRAL CONTROL VALVE
27 FE	- 2734 3AP0220LC	AIR TO AEROBIC DIGESTION TANK	F 3	1612-B								
27 FI	- 2734	AIR TO AEROBIC DIGESTION TANK	F 3	1612-K								
27 FE	- 2736 2DM0225LC	WASTE ACTIVATED SLUDGE TO TK-2718 AEROBIC DIGEST TANK	F 3	1612-H								MAGNETIC FLOW METER (ELEMENT & XMTR)
27 FI	- 2736	WASTE ACTIVATED SLUDGE TO TK-2718 AEROBIC DIGEST TANK	P 3	NOTE-1								
27 FE	- 2741 4HW0311LC	FILTRATION EFFLUENT TO A-2705 CARBON	F 4	1612-B								
27 FI	- 2741	FILTRATION EFFLUENT TO A-2705 CARBON	P 4	NOTE-1								
27 FOI	- 2741	FILTRATION EFFLUENT TO A-2705 CARBON	P 4	NOTE-1								
27 FT	- 2741 4HW0311LC	FILTRATION EFFLUENT TO A-2705 CARBON	F 4	1612-A								
27 FE	- 2752 A2722	EVAP. SYSTEM	F 5	NOTE-5								VENDOR

CONTRACT: 15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -FLOW      SHEET NUMBER 006

R E V	A R E A	TAG NUMBER E LINE NUMBER A	SERVICE	LOCN EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET. PIPG DET.	ELEC WINTM DIAG DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
		27 FI - 2752	EVAP. SYSTEM	P 5		NOTE-1					
		27 FT - 2752 A2722	EVAP. SYSTEM	F 5		NOTE-5					VENDOR
		27 FI - 2761 1MU0612LC	SERVICE WATER TO BELT FILTER POLYMER	F 6		1612-E					ROTAMETER & INTEGRAL CONTROL VALVE
		27 FI - 2763 2WU0614LC	SERVICE WATER TO BELT FILTER PRESS	F 6		1612-E					INTEGRAL FLOW METER & CONT VALVE

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -HAND      SHEET NUMBER 007

R E V	A R E A	TAG NUMBER LINE NUMBER	SERVICE	LOCN EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET. PIPG DET.	ELEC WINTN DIAG DET.	PIPG OWG ISO.	INSTR LOCN PLAN	REMARKS
		27 HS - 2703 P-2710A/B	ACID METERING PUMP	P 1	NOTE-1						S/S-SELECT
		27 HS - 2705 P-2709A/B	CAUSTIC METERING PUMP	P 1	NOTE-1						S/S - SELECT
		27 HS - 2707 P-2701A/B	EQUALIZATION BASIN PUMP	P 1	NOTE-1						S/S - SELECT
		27 HS - 2709 P-2733	ACID METERING PUMP TO TK-2722	P 1	NOTE-1						S/S
		27 HCV - 2710 4AP0219LC	AERATION BASIN AIR CONTROL	F 1	1625-8						
		27 HS - 2715 S-2702A/B	DISOLVED AIR FLOTATION SYSTEM	P 2	NOTE-1						S/S SELECT
		27 HS - 2719 S-2702A/B	DISOLVED AIR FLOTATION SYSTEM	P 2	NOTE-1						S/S SELECT
		27 HS - 2721 B-2704ABCD	AERATION BLOWER	P 2	NOTE-1						S/S SELECT
		27 HS - 2726 P-2711A/B	RETURN SLUDGE PUMP	P 2	NOTE-1						S/S SELECT
		27 HS - 2728 P-2719A/B	NUTRIENT METERING PUMP	P 2	NOTE-1						S/S SELECT
		27 HS - 2730 A-2717	POLYMER METERING PUMP	P 2	NOTE-1						S/S
		27 HCV - 2731 6AP0229LC	AERATION BASIN AIR CONTROL	F 2	1625-8						
		27 HS - 2732 P-2726A/B	SPENT BACKWASH PUMPS PUMP	F 2	NOTE-7						SELECT
		27 HS - 2741 P-2712A/B	FILTER FEED PUMP	P 3	NOTE-1						AUTO/SELECT/S/S

216



CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -HAND      SHEET NUMBER 008

R E V	A R E L I N E N U M B E R	TAG NUMBER E LINE NUMBER A	SERVICE	LOCN EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET. PIPG DET.	ELEC WINTN DIAG DET.	PIPG DMG ISO.	INSTR LOCN PLAN	REMARKS
		27 HCV - 2742 3AP0220LC	AIR TO AEROBIC DIGESTER TK-2718	F 3	1625-B						BUTTERFLY
		27 HS - 2743 P-2725A/B	CARBON COLUMN FEED PUMP	P 3	NOTE-1						AUTO/SELECT/S/S
		27 HCV - 2744 2"AU270318LC	DIGESTED SLUDGE PUMP AIR SUPPLY	F 3	1625-C						VAR SPEED PUMP CONT.
		27 HCV - 2745 P-2704B	DIGESTED SLUDGE PUMP AIR SUPPLY	F 3	1625-C						VAR SPEED PUMP CONT.
		27 HCV - 2746 P-2704C	DIGESTED SLUDGE PUMP AIR SUPPLY	F 3	1625-C						VAR SPEED PUMP CONT.
		27 HS - 2747 A-2719	POLYMER FEED PUMP	P 3	NOTE-1						S/S
		27 HS - 2767 P-2724A/B	TREATED WASTEWATER PUMPS	P 5	NOTE-1						SELECT/AUTO/S/S
		27 HS - 2772 A-2722	EVAPORATION SYSTEM	P 5	NOTE-1						S/S
		27 HS - 2773 A-2722	EVAPORATION SYSTEM	P 5	NOTE-1						S/S
		27 HS - 2774 A-2722	EVAPORATION SYSTEM	P 5	NOTE-1						S/S
		27 HS - 2776 A-2722	EVAPORATION SYSTEM	P 5	NOTE-1						S/S
		27 HS - 2778 A-2722	EVAPORATION SYSTEM MIXER	P 5	NOTE-1						S/S
		27 HS - 2780 A-2722	EVAPORATION SYSTEM PUMP	P 5	NOTE-1						S/S
		27 HS - 2781		P 5	NOTE-1						

CONTRACT: 15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -HAND      SHEET NUMBER 009

REV	DESCRIPTION	SERVICE	LOCN	EFD	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
27	HCV - 2785 P-2728A	BELT FILTER PRESS FEED PUMP	F	6	1625-C								VAR SPEED PUMP CONT.
27	HCV - 2786 P-2728B	BELT FILTER PRESS FEED PUMP	F	6	1625-C								VAR SPEED PUMP CONT.
27	HIC - 2790	EVAP. SYSTEM	F	5	NOTE-5								VENDOR

CONTRACT: 15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      --LEVEL      SHEET NUMBER 010

R E V	A R TAG NUMBER E LINE NUMBER A	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTM DET.	PIPG DNW ISO.	INSTR LOCN PLAN	REMARKS
	27 HS - 2701 P-2715A/B	COAL PREP AREA BASIN PUMP P-2715A/B SEL.	F	1	NOTE-7								SELECT P2715A OR B
	27 LAH - 2701	COAL PREP AREA RUNOFF BASIN	P	1	NOTE-1								
	27 LSH - 2701	COAL PREP AREA RUNOFF BASIN	F	1	1613-0								
	27 LSHL - 2701	COAL PREP AREA RUNOFF BASIN	F	1	1613-0								CONTROLS P-2715A/B
	27 LG - 2702 D-2702	ACID DAY DRUM	F	1	1613-B								
	27 LG - 2703 D-2701	CAUSTIC DAY DRUM	F	1	1613-B								
	27 LAH - 2704	EQUALIZATION BASIN	P	1	NOTE-1								
	27 LAL - 2704	EQUALIZATION BASIN	P	1	NOTE-1								
	27 LIC - 2704	EQUALIZATION BASIN	P	1	NOTE-1								RESETS FIC-2704
	27 LT - 2704 A-2707	EQUALIZATION BASIN	F	1	1613-A								
	27 LAH - 2705	ACID DAY DRUM	P	1	NOTE-1								
	27 LSH - 2705 D-2702	ACID DAY DRUM	F	1	1613-0								
	27 LAH - 2706	ACID DAY DRUM	P	1	NOTE-1								
	27 LAL - 2706	ACID DAY DRUM	P	1	NOTE-1								

219

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00 DATE 03/23/81

AREA 27 WASTEWATER TREATMENT -LEVEL

SHEET NUMBER 011

REV	LINE NUMBER	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET. PIPG DET.	ELEC WINTN DIAG DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
R	A										
E	R TAG NUMBER	SERVICE	LOCN	EFD	REQ NO	VENDOR NAME	PROC AIR	ELEC WINTN	PIPG	INSTR	REMARKS
V	E LINE NUMBER				P.O. NO		DET. PIPG	DIAG DET.	DWG	LOCN	
A	A						DET.		ISO.	PLAN	
	27 LT - 2706 D-2702	ACID DAY DRUM	F	1	1613-C						O/P CELL
	27 LI - 2706-A	ACID DAY DRUM	P	1	NOTE-1						
	27 LI - 2706-B	ACID DAY DRUM	F	1	1613-C						
	27 LAH - 2707	CAUSTIC DAY DRUM	P	1	NOTE-1						
	27 LSH - 2707 D-2701	CAUSTIC DAY DRUM	F	1	1613-D						
	27 LAH - 2708	CAUSTIC DAY DRUM	P	1	NOTE-1						
	27 LAL - 2708	CAUSTIC DAY DRUM	P	1	NOTE-1						
	27 LT - 2708 D-2701	CAUSTIC DAY DRUM	F	1	1613-C						O/P CELL
	27 LI - 2708-A	CAUSTIC DAY DRUM	P	1	NOTE-1						
	27 LI - 2708-B	CAUSTIC DAY DRUM	F	1	1613-C						
	27 LAL - 2711	POWDERED CARBON STORAGE	F	2	NOTE-1						
	27 LSL - 2711	POWDERED CARBON STORAGE	F	2	1613-E						
	27 HS - 2712	DAF FROTH PUMP P-2720A/B SELECT	F	2	NOTE-7						
	27 LAH- 2712	DAF FROTH PUMP SUMP	P	2	NOTE-1						

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: R.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00 DATE 03/23/81 AREA 27 WASTEWATER TREATMENT -LEVEL SHEET NUMBER 012

REV	LINE NUMBER	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG DET.	WINTH DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
	27 LSM - 2712	DAF FROTH PUMP SUMP	F	2	1613-D								
	27 LSM - 2712	DAF FROTH PUMP SUMP	F	2	1613-D								
	27 LG - 2713 D-2703	NUTRIENT STORAGE	F	2	1613-B								
	27 LIC - 2714	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
	27 LT - 2714 S-2702A	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
	27 LV - 2714	DISOLVED AIR FLUTATION SYSTEM	F	2	NOTE-5								VENDOR
	27 LIC - 2715	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
	27 LT - 2715 S-2702B	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
	27 LV - 2715	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
	27 LAH - 2716	NUTRIENT STORAGE	P	2	NOTE-1								
	27 LAL - 2716	NUTRIENT STORAGE	P	2	NOTE-1								
	27 LT - 2716 D-2703	NUTRIENT STORAGE	F	2	1613-C								BUBBLER
	27 LI - 2716-A	NUTRIENT STORAGE	P	2	NOTE-1								
	27 LI - 2716-B	NUTRIENT STORAGE	F	2	1613-C								

221

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENRGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -LEVEL      SHEET NUMBER 013

REVISION	DESCRIPTION	SERVICE	LOCN	EPD	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DET.	WINTN DET.	PIPG ISO.	INSTR PLAN	REMARKS
27	LAH - 2717	NUTRIENT STORAGE	P	2	NOTE-1								
27	LSH - 2717 D-2703	NUTRIENT STORAGE	F	2	1613-0								
27	LG - 2718 S-2702A	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
27	LG - 2719 S-2702B	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5								VENDOR
27	LG - 2720 A-2717	POLYMER MIXING TANK	F	2	NOTE-5								VENDOR
27	LAH - 2731	FILTER FEED PUMP CONTROL	P	3	NOTE-1								
27	LAL - 2731	FILTER FEED PUMP CONTROL	P	3	NOTE-1								
27	LIC - 2731	FILTER FEED PUMP CONTROL	P	3	NOTE-1								
27	LT - 2731 P-2712A/B	FILTER FEED PUMP CONTROL	F	3	1613-A								
27	LV - 2731 4WV0301LC	FILTER FEED PUMP CONTROL	F	3	1623-A								
27	LY - 2731	FILTER FEED PUMP CONTROL	F	3	1619-A								1/P
27	HS - 2732 P-2726A/B	SPENT BACKWASH PUMPS P-2726A/B SELECT	F	3	NOTE-7								
27	LAH - 2732	SPENT BACK WASH PUMP	P	3	NOTE-1								
27	LSH - 2732	SPENT BACK WASH PUMP	F	3	1613-0								

CONTRACT: 15-1910 CONJCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -LEVEL      SHEET NUMBER 014

R E V	A R E A	TAG NUMBER E LINE NUMBER A	SERVICE	LOCN EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET. PIPG DET.	ELEC WINTN DIAG DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
		27 LSHL- 2732	SPENT BACK WASH PUMP	F 3	1613-D						CONTROLS P-2726A/B
		27 LAH - 2733	CARBON COLUMN FEED PUMP	P 3	NOTE-1						
		27 LAL - 2733	CARBON COLUMN FEED PUMP	P 3	NOTE-1						
		27 LIC - 2733	CARBON COLUMN FEED PUMP	P 3	NOTE-1						
		27 LT - 2733 P-2725A/B	CARBON COLUMN FEED PUMP	F 3	1613-A						
		27 LV - 2733 4WV0311LC	CARBON COLUMN FEED PUMP	F 3	1623-A						
		27 LY - 2733	CARBON COLUMN FEED PUMP	F 3	1619-A						I/P
		27 LSL - 2734 A-2720-A	GRAVITY FILTRATION SYS	F 3	NOTE-5						VENDOR
		27 LSL - 2735 A-2720-B	GRAVITY FILTRATION SYS	F 3	NOTE-5						VENDOR
		27 LG - 2736 A-2719	POLYMER MIXING TANK	F 3	NOTE-5						VENDOR
		27 HS - 2751 P-2729A/B	CLEAN STORM WATER PUMP	F 4	NOTE-7						SELECT S19 FROM LSHL-2751
		27 LAH - 2751	CLEAN STORM WATER PUMP	P 4	NOTE-1						
		27 LSH - 2751	CLEAN STORM WATER PUMP	F 4	1613-D						
		27 LSHL- 2751	CLEAN STORM WATER PUMP	F 4	1613-D						

223

CONTRACT: 15-1910 CONOCO/DUE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION: 00      DATE: 03/23/81      AREA: 27      WASTEWATER TREATMENT      -LEVEL      SHEET NUMBER: 015

R E V	A TAG NUMBER LINE NUMBER A	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC	AIR	ELEC	WINTN	PIPG	INSTR	REMARKS
							DET.	PIPG DET.	DIAG	DET.	DWG ISO.	LOCN PLAN	
	27 HS - 2753 P-2731-A/B	SANITARY EFFLUENT PUMPS	F	4	NOTE-7								PUMP SELECT
	27 LAH - 2753	SANITARY EFFLUENT PUMPS	P	4	NOTE-1								
	27 LSH - 2753	SANITARY EFFLUENT PUMPS	F	4	1613-D								
	27 LSHL - 2753	SANITARY EFFLUENT PUMPS	F	4	1613-D								
	27 LAH - 2761	EVAP. SYSTEM	P	5	NOTE-1								
	27 LAL - 2761	EVAP. SYSTEM	P	5	NOTE-1								
	27 LIC - 2761	EVAP. SYSTEM	P	5	NOTE-1								
	27 LT - 2761	EVAP. SYSTEM	F	5	NOTE-5								
	27 LV - 2761 4HW0518LC	EVAP SYSTEM FEED	F	5	NOTE-5								
	27 LY - 2761	EVAP SYSTEM FEED	F	5	NOTE-5								I/P
	27 HS - 2762 P-2730A/B	BRINE PUMPS P-2730AB	F	5	NOTE-7								SELECT
	27 LSHL - 2762 A-2722	EVAP. SYSTEM	F	5	NOTE-5								CONTROLS P-2730A/B VIA HS-2762
	27 LAH - 2763	EVAP. SYSTEM	P	5	NOTE-5								
	27 LAL - 2763	EVAP. SYSTEM	P	5	NOTE-1								

224



CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -LEVEL      SHEET NUMBER 016

REVISION	DESCRIPTION	SERVICE	LOCN	EFD	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
A	27 LIC - 2763	EVAP. SYSTEM	P	5	NOTE-1								
	27 LT - 2763 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 LV - 2763 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 LY - 2763	EVAP. SYSTEM	F	5	NOTE-5								VENDOR I/P
	27 LAH - 2764	EVAP. SYSTEM	P	5	NOTE-1								
	27 LAL - 2764	EVAP. SYSTEM	P	5	NOTE-1								
	27 LIC - 2764	EVAP. SYSTEM	P	5	NOTE-1								
	27 LT - 2764 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 LV - 2764 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 LY - 2764	EVAP. SYSTEM	F	5	NOTE-5								VENDOR I/P
	27 LAH - 2765	EVAP. SYSTEM	P	5	NOTE-1								
	27 LAL - 2765	EVAP. SYSTEM	P	5	NOTE-1								
	27 LIC - 2765	EVAP. SYSTEM	P	5	NOTE-1								
	27 LT - 2765 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR

225

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -LEVEL      SHEET NUMBER 017

R E V	A R TAG NUMBER E LINE NUMBER A	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC WINTN DIAG DET.	PIPG OWG ISO.	INSTR LOCN PLAN	REMARKS
	27 LV - 2765 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
	27 LY - 2765	EVAP. SYSTEM	F	5	NOTE-5							VENDOR 1/P
	27 LAH - 2766	TREATED WASTEWATER STORAGE TANK	P	5	NOTE-1							
	27 LAL - 2766	TREATED WASTEWATER STORAGE TANK	P	5	NOTE-1							CUTS OFF PUMPS P-2724A/B
	27 LI - 2766	TREATED WASTEWATER STORAGE TANK	F	5	1613-C							
	27 LIC - 2766	TREATED WASTEWATER STORAGE TANK	P	5	NOTE-1							
	27 LT - 2766 TK-2720	TREATED WASTEWATER STORAGE TANK	F	5	1613-C							D/P CELL
	27 LV - 2766 6WNO504LC	TREATED WASTEWATER STORAGE TANK	F	5	1623-A							
	27 LY - 2766	TREATED WASTEWATER STORAGE TANK	F	5	1619-A							
	27 LG - 2767 TK-2720	TREATED WASTE WATER STORAGE TANK TK-2720	F	5	1613-H							
	27 LAH - 2768	EVAP FEED TANK	P	5	NOTE-1							
	27 LAL - 2768	EVAP FEED TANK	P	5	NOTE-1							
	27 LT - 2768 TK-2722	EVAP FEED TANK	F	5	1613-H							
	27 LI - 2768-A	EVAP FEED TANK	P	5	NOTE-1							

226

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -LEVEL      SHEET NUMBER 01-8

R E V	A R E A	TAG NUMBER LINE NUMBER	SERVICE	LOCN EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG EMG ISO.	INSTR LOCN PLAN	REMARKS
		27 LI - 2768-B	EVAP FEED TANK	F 5	1613-H								
		27 LIC - 2770	EVAP. SYSTEM	P 5	NOTE-1								
		27 LT - 2770 A-2722	EVAP. SYSTEM	F 5	NOTE-5								VENDOR
		27 LV - 2770 A-2722	EVAP. SYSTEM	F 5	NOTE-5								VENDOR
		27 LY - 2770	EVAP. SYSTEM	F 5	NOTE-5								VENDOR I/P TRANS.
		27 LAH - 2782	SLUDGE PUMP CONTRDL	P 6	NOTE-1								
		27 LSH - 2782	SLUDGE PUMP CONTRDL	F 6	1613-D								
		27 LSH - 2782	SLUDGE PUMP CONTROL	F 6	1613-D								
		27 HS - 2783 P-2705A/B	RECOVERED OIL PUMPS	F 6	NOTE-7								SELECT (PUMPS) S19 FROM LSL-2783
		27 LAH - 2783	RECOVERED OIL PUMP CONTROL	P 6	NOTE-1								
		27 LSH - 2783	RECOVERED OIL PUMP CONTROL	F 6	1613-D								
		27 LSL - 2783	RECOVERED OIL PUMP CONTROL	F 6	1613-D								
		27 LAH - 2784	SLUDGE HOLDING TANK	P 6	NOTE-1								
		27 LAL - 2784	SLUDGE HOLDING TANK	P 6	NOTE-1								

227

CONTRACT: 15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00 DATE 03/23/81

AREA 27 WASTEWATER TREATMENT

-LEVEL

SHEET NUMBER 019

R E V	A R E L I N E N U M B E R	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC	AIR	ELEC	WINTN	PIPG	INSTR LOCN PLAN	REMARKS
							DET.	PIPG DET.	DIAG DET.	DMG ISO.			
	27 LI - 2784	SLUDGE HOLDING TANK	P	6	NOTE-1								
	27 LT - 2784 TK-2717	SLUDGE HOLDING TANK	F	6	1613-E								
	27 LAH - 2785	SLOP OIL TANK	P	6	NOTE-1								
	27 LT - 2785 TK-2701	SLOP OIL TANK	F	6	1613-H								
	27 LI - 2785-A	SLOP OIL TANK	F	6	1613-H								
	27 LI - 2785-B TK-2701	SLOP OIL TANK	P	6	NOTE-1								
	27 LAH - 2786 TK-2702	SLOP OIL TANK	P	6	NOTE-1								
	27 LT - 2786 TK-2702	SLOP OIL TANK	F	6	1613-H								
	27 LI - 2786-A TK-2702	SLOP OIL TANK	F	6	1613-H								
	27 LI - 2786-B TK-2702	SLOP OIL TANK	P	6	NOTE-1								
	27 LG - 2787 A-2716	POLYMER MIX TANK	F	6	NOTE-5								VNEDOR

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -PRES      SHEET NUMBER 020

REV	DESCRIPTION	SERVICE	LOCN	EFD	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG DMG ISO.	INSTR LOCN PLAN	REMARKS
27	PG - 2702 2CWR0103LC	COAL PREP AREA RUNOFF BASIN PUMP	F	1	1614-B								
27	PG - 2703 2CWR0103LC	COAL PREP AREA RUNOFF BASIN PUMP	F	1	1614-B								
27	PG - 2704 1 CO108AS	ACID METERING PUMP P-2710A	F	1	1614-B								CHEM SEAL
27	PG - 2705 1 CO108AS	ACID METERING PUMP P-2710B	F	1	1614-B								CHEM SEAL
27	PG - 2706 1 CO110AK2	CAUSTIC METERING PUMP P-2709A	F	1	1614-B								CHEM SEAL
27	PG - 2707 1 CO110AK2	CAUSTIC METERING PUMP P-2709B	F	1	1614-B								CHEM SEAL
27	PG - 2708 4HW0117LC	EQUALIZATION BASIN PUMP P-2701A	F	1	1614-B								
27	PG - 2709 4HW0117LC	EQUALIZATION BASIN PUMP P-2701B	F	1	1614-B								
27	PG - 2710 P-2733	ACID METERING PUMP DISCH TO TK-2722	F	1	1614-B								CHEM SEAL
27	PCV - 2719-A TK-2702	N2 BLANKET	F	6	1624-C								
27	PCV - 2719-B TK-2702	N2 BLANKET	F	6	1624-C								
27	PCV - 2719-C TK-2702	N2 BLANKET	F	6	1624-C								
27	PSV - 2720 TK-2702	SLOP OIL TANK	F	6	1639-A								
27	PG - 2721 1WU0212LC	CARBON TRANSPORT AIR SUPPLY (J-2701)	F	2	1614-B								

229

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -PRES      SHEET NUMBER 021

R E V A	TAG NUMBER LINE NUMBER	SERVICE	LOCM	EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET.	ELEC PIPG DIAG DET.	WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
27	PG - 2723 1.5HW0206LC	P-2720A DAF FROTH PUMP DISCH	F	2	1614-8							
27	PG - 2724 1.5HW0206LC	P-2720B DAF FROTH PUMP DISCH	F	2	1614-8							
27	PG - 2725 S-2702A	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5							VENDOR
27	PG - 2726 S-2702A	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5							VENDOR
27	PG - 2727 S-2702B	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5							VENDOR
27	PG - 2728 S-2702B	DISOLVED AIR FLOTATION SYSTEM	F	2	NOTE-5							VENDOR
27	PG - 2729 .75CO216RH1	P-2719A NUTRIENT METERING PUMP DISCH	F	2	1614-8							CHEM SEAL
27	PG - 2730 .75CO216RH1	P-2719B NUTRIENT METERING PUMP DISCH	F	2	1614-8							CHEM SEAL
27	PG - 2731 3DM0224LC	RETURN SLUDGE PUMP P-2711A DISCH	F	2	1614-8							CHEM SEAL
27	PG - 2732 3DM0224LC	RETURN SLUDGE PUMP P-2711B DISCH	F	2	1614-8							CHEM SEAL
27	PG - 2733 A-2717	POLYMER METERING PUMP DISCH	F	2	NOTE-5							VENDOR
27	PCV - 2734 2AU0211LC	DISSOLVED AIR FLOTATION SYSTEM S-2702A/B	F	2	NOTE-5							VENDOR
27	PSV - 2735 P-2711A	RETURN SLUDGE PUMP	F	2	NOTE-5							
27	PSV - 2736 P-2711B	RETURN SLUDGE PUMP	F	2	NOTE-5							

CONTRACT: 15-1910 CONUCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00 DATE 03/23/81 AREA 27 WASTEWATER TREATMENT -PRES SHEET NUMBER 022

REV	AREA	TAG NUMBER LINE NUMBER	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC WINTN DIAG	WINTN DET.	PIPG DNG ISO.	INSTR LOCN PLAN	REMARKS
	27	PG - 2737 A-2717	POLYMER METERING PUMP DISCH.	F	2	NOTE-5								VENDOR
	27	PG - 2741 4HW0301LC	FILTER FEED PUMP P-2712A DISCH.	F	3	1614-8								
	27	PG - 2742 4HW0301LC	FILTER FEED PUMP P-2712B DISCH.	F	3	1614-8								
	27	PG - 2743 2HW0309LC	SPENT BACKWASH PUMP P-2726A DISCH.	F	3	1614-8								
	27	PG - 2744 2HW0309LC	SPENT BACKWASH PUMP P-2726B DISCH.	F	3	1614-8								
	27	PG - 2745 4HW0311LC	CARBON COLUMN FEED P UMP P-2725A DISCH.	F	3	1614-8								
	27	PG - 2746 4HW0311LC	CARBON COLUMN FEED PUMP P-2725B DISCH.	F	3	1614-8								
	27	PG - 2747 2DM0315LC	DIGESTED SLUDGE PUMP P-2704A DISCH.	F	3	1614-8								CHEM SEAL
	27	PG - 2748 2DM0315LC	DIGESTED SLUDGE PUMP P-2704B DISCH.	F	3	1614-8								CHEM SEAL
	27	POI - 2749	GRAVITY FILTRATION SYSTEM	P	3	NOTE-1								
	27	POSH- 2749	GRAVITY FILTRATION SYSTEM	F	3	NOTE-5								VENDOR
	27	POT - 2749 A-2720A	GRAVITY FILTRATION SYSTEM	F	3	NOTE-5								VENDOR
	27	POV - 2749 A-2720A	GRAVITY FILTRATION SYSTEM	F	3	NOTE-5								VENDOR-3 WAY
	27	POI - 2750	GRAVITY FILTRATION SYSTEM	P	3	NOTE-1								

231

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -PRES      SHEET NUMBER 023

REV	DESCRIPTION	SERVICE	LOCN	EPD	REQ NO	VENDOR NAME	PROC DET.	AIR DET.	ELEC DET.	WINTN DET.	PIPG ISO.	INSTR PLAN	REMARKS
27	POSH- 2750	GRAVITY FILTRATION SYSTEM	F	3	NOTE-5								
27	POT - 2750 A-2720-B	GRAVITY FILTRATION SYSTEM	F	3	NOTE-5								
27	POV - 2750 A-2720-B	GRAVITY FILTRATION SYSTEM	F	3	NOTE-5								
27	PG - 2751 P-2704C	DIGESTED SLUDGE PUMP P-2704C DISCH.	F	3	1614-B								CHEM SEAL
27	PG - 2752 A-2719	POLYMER FEED PUMP DISCH	F	3	NOTE-5								VENDOR
27	PG - 2757 P-2704A	DIGESTED SLUDGE PUMP AIR SUPPLY	F	3	1614-B								
27	PG - 2758 P-2704B	DIGESTED SLUDGE PUMP AIR SUPPLY	F	3	1614-B								
27	PG - 2759 P-2704C	DIGESTED SLUDGE PUMP AIR SUPPLY	F	3	1614-B								
27	PDAH- 2761	CARBON ABSORPTION SYSTEM	P	4	NOTE-1								
27	PDI - 2761	CARBON ABSORPTION SYSTEM	P	4	NOTE-1								
27	POT - 2761 A-2705	CARBON ABSORPTION SYSTEM	F	4	NOTE-5								VENDOR
27	PDAH- 2762	CARBON ABSORPTION SYSTEM	P	4	NOTE-1								
27	PDI - 2762	CARBON ABSORPTION SYSTEM	P	4	NOTE-1								
27	POT - 2762 A-2705	CARBON ABSORPTION SYSTEM	F	4	NOTE-5								VENDOR



CONTRACT:15-1910 CONOCU/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -PRES      SHEET NUMBER 024

REVISION	AREA	R TAG NUMBER	SERVICE	LOCN	EFD	REQ NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG	WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
	27 PG	- 2763 2PSC0411LC	CLEAN STORMWATER PUMP P-2729A DISCH.	F	4	1614-B								
	27 PG	- 2764 2DSC0410LC	CLEAN STORMWATER PUMP P-2729B DISCH.	F	4	1614-B								
	27 PG	- 2765 1.50Y0416LC	SANITARY EFFLUENT PUMP P-2731A DISCH.	F	4	1614-B								
	27 PG	- 2766 1.50Y0416LC	SANITARY EFFLUENT PUMP P-2731B DISCH.	F	4	1614-B								
	27 PG	- 2767 A-2702	SANITARY TREATMENT SYSTEM WASTE SLUDGE	F	4	NOTE-5								CHEM SEAL VENDOR
	27 PG	- 2769 4WW270518LC	EVAP. FEED PUMP	F	5	1614-B								
	27 PG	- 2770 4WW270518LC	EVAP. FEED PUMP	F	5	1614-B								
	27 PG	- 2771 P-2713A	BACKWASH PUMP DISCH.	F	5	1614-B								
	27 PG	- 2772 P-2713B	BACKWASH PUMP DISCH.	F	5	1614-B								
	27 PG	- 2773 P-2730A	BRINE PUMP DISCH.	F	5	1614-B								
	27 PG	- 2774 P-2730B	BRINE PUMP DISCH.	F	5	1614-B								
	27 PG	- 2775 P-2724A	TREATED WASTEWATER PUMP DISCH	F	5	1614-B								
	27 PG	- 2776 P-2724B	TREATED WASTEWATER PUMP DISCH	F	5	1614-B								
	27 PG	- 2777 A-2722	PUMP DISCH.	F	5	NOTE-5								VENDOR

233

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00 DATE 03/23/81

AREA 27 WASTEWATER TREATMENT -PRES

SHEET NUMBER 025

REV	LINE NUMBER	SERVICE	LOCN	EFJ	REQ NO P.O. NO	VENDOR NAME	PROC DET.	AIR PIPG DET.	ELEC DIAG DET.	WINTN DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
	27 PG - 2778 A-2722	PUMP DISCH.	F	5	NOTE-5								VENDOR
	27 PG - 2780 A-2722	PUMP DISCH.	F	5	NOTE-5								VENDOR
	27 PAH - 2781	EVAP. SYSTEM	P	5	NOTE-1								
	27 PAHL - 2781	EVAP. SYSTEM	P	5	NOTE-1								
	27 PAL - 2781	EVAP. SYSTEM	P	5	NOTE-1								
	27 PIC - 2781	EVAP. SYSTEM	P	5	NOTE-1								
	27 PT - 2781 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 PV - 2781 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 PY - 2781	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 PIC - 2782	EVAP. SYSTEM	P	5	NOTE-1								
	27 PT - 2782 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 PV - 2782 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 PY - 2782	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27 PG - 2784 A-2722	EVAP. SYSTEM	F	5	NOTE-5								VENDOR

234

CONTRACT: 15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -PRES      SHEET NUMBER 026

R E V	A R E A	TAG NUMBER E LINE NUMBER	SERVICE	LOCN	FFD	REQ NO P.O. NO	VENDOR NAME	PROC	AIR	ELEC	WINTN	PIPG	INSTR	REMARKS
								DET.	PIPG	DIAG	DET.	DWG	LOCN	
	27	PDG - 2785	EVAP. SYSTEM	F	5	NOTE-5								VENDOR
	27	PG - 2786 A-2716	POLYMER PUMP DISCH.	F	6	NOTE-5								VENDOR
	27	PG - 2787 P-2728A	FILTER PRESS FEED PUMP AIR SUPPLY	F	6	1614-B								
	27	PG - 2788 P-2728B	FILTER PRESS FEED PUMP AIR SUPPLY	F	6	1614-B								
	27	PG - 2789 A-2716	POLYMER PUMP DISCH.	F	6	NOTE-5								VENDOR
	27	PG - 2790 3 P0622A	RECOVERED OIL OUTPUT TO SECT 3203	F	6	1614-B								
	27	PG - 2791 P-2727A	SLUDGE PUMP DISCH.	F	6	1614-B								CHEM SEAL
	27	PG - 2792 P-2727B	SLUDGE PUMP DISCH.	F	6	1614-B								CHEM SEAL
	27	PG - 2793 P-2705A	RECOVERED OIL PUMP DISCH.	F	6	1614-B								
	27	PG - 2794 P-2705B	RECOVERED OIL PUMP DISCH.	F	6	1614-B								
	27	PG - 2795 P-2728A	BELT FILTER PRESS PUMP DISCH.	F	6	1614-B								CHEM SEAL
	27	PG - 2796 P-2728B	BELT FILTER PRESS PUMP DISCH.	F	6	1614-B								CHEM SEAL
	27	PCV - 2797 1.5 N0627A	TK-2701 SLOP OIL TANK N PURGE	F	6	1624-C								
	27	PCV - 2798-A TK-2701	N2 BLANKET	F	6	1624-C								INSTALL UPSIDE DOWN

235

CONTRACT:15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81

AREA 27      WASTEWATER TREATMENT

-PRES

SHEET NUMBER 027

R E V	A R TAG NUMBER E LINE NUMBER A	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC	AIR	ELEC	WINTN	PIPG	INSTR	REMARKS
							DET.	PIPG	DIAG	DET.	DMG	LOCN	
	27 PCV - 2798-B TK-2701	N2 BLANKET	F	6	1624-C								
	27 PCV - 2798-C TK-2701	N2 BLANKET	F	6	1624-C								
	27 PSV - 2799 TK-2701	SLOP OIL TANK	F	6	1639-A								



CONTRACT: 15-1910 CONOCO/DDE  
 INSTRUMENT ENGINEER: B.P. SERNA.

MASTER INSTRUMENT INDEX

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N.J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -TEMP      SHEET NUMBER 029

REV	LINE NUMBER	SERVICE	LOCN	EPD	REQ NO: P.O. NO:	VENDOR NAME	PROC AIR DET.	ELEC PIPG DIAG DET.	WINTN DET.	PIPG DWG ISO	INSTR LOCN PLAN	REMARKS
27	TT - 2741 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
27	TV - 2741 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
27	TY - 2741	EVAP. SYSTEM	F	5	NOTE-5							VENDOR I/P
27	TE - 2742 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
27	TI - 2742	EVAP. SYSTEM	P	5	NOTE-1							
27	TT - 2742 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
27	TE - 2743 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
27	TI - 2743	EVAP. SYSTEM	P	5	NOTE-1							
27	TT - 2743 A-2722	EVAP. SYSTEM	F	5	NOTE-5							VENDOR
27	TE - 2751 TK-2701	SLOP OIL TANK MP STEAM CONTROL	F	6	1611-A							
27	TI - 2751	SLOP OIL TANK TK-2701	P	6	NOTE-1							
27	TT - 2751 TK-2701	SLOP OIL TANK TK2701	F	6	1611-C							
27	TG - 2752 TK-2701	SLOP OIL TANK TK-2701	F	6	1611-B							
27	TE - 2756 TK-2717	SLUDGE HOLDING TANK	F	6	1611-A							

238







CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -MISC      SHEET NUMBER 032

R E V	A R T I C L E N U M B E R	TAG NUMBER E L I N E N U M B E R	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR DET.	ELEC MINTN DIAG DET.	PIPG DWG ISO.	INSTR LOCN PLAN	REMARKS
		27 RI - 2721 8-2704A	AREATION BLOWER	P	2	NOTE-1						
		27 RI - 2722 8-2704A	AREATION BLOWER	P	2	NOTE-1						
		27 RI - 2723 8-2704C	AREATION BLOWER	P	2	NOTE-1						
		27 RI - 2724 8-2704D	AREATION BLOWER	P	2	NOTE-1						
		27 RI - 2725 CL-2702	AREATION BLOWER	P	2	NOTE-1						
241		27 RI - 2726 P-2711A	RETURN SLUDGE PUMP	P	2	NOTE-1						
		27 RI - 2727 P-2711B	RETURN SLUDGE PUMP	P	2	NOTE-1						
		27 RI - 2728 P-2719A	NUTIRENT METERING PUMP P-2719A	P	2	NOTE-1						
		27 RI - 2729 P-2719B	NUTRIENT METERING PUMP P-2719B	P	2	NOTE-1						
		27 RI - 2730 A-2717	POLYMER METERING PUMP	P	2	NOTE-1						
		27 RI - 2741 P-2712A	FILTER FEED PUMP	P	3	NOTE-1						
		27 RI - 2742 P-2712B	FILTER FEED PUMP	P	3	NOTE-1						
		27 RI - 2743 P-2725A	CARBON COLUMN FEED PUMP	P	3	NOTE-1						
		27 RI - 2744 P-2725B	CARBON COLUMN FEED PUMP	P	3	NOTE-1						

CONTRACT: 15-1910 CONOCO/DOE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81

AREA 27      WASTEWATER TREATMENT

-MISC

SHEET NUMBER 033

R E V	A TAG NUMBER E LINE NUMBER A.	SERVICE	LOCN	EFD	REQ NO P.O. NO	VENDOR NAME	PROC AIR	ELEC	WINTN	PIPG	INSTR	REMARKS
							DET.	PIPG	DIAG	DET.	DWG	
							DET.			ISO.	PLAN	
27	RI - 2747 A-2719	POLYMER FEED PUMP	P	3	NOTE-1							
27	RI - 2761 A-2702	SANITARY TREATMENT SYSTEM	P	4	NOTE-1							
27	RI - 2767-A P-2724A	TREATED WASTEWATER PUMP	P	5	NOTE-1							
27	RI - 2767-B P-2724B	TREATED WASTEWATER PUMP	P	5	NOTE-1							
27	RI - 2772 A-2722	EVAPORATION SYSTEM	P	5	NOTE-1							
27	RI - 2773 A-2722	EVAPORATION SYSTEM	P	5	NOTE-1							
27	RI - 2774 A-2722	EVAPORATION SYSTEM	P	5	NOTE-1							
27	RI - 2776 A-2722	EVAPORATION SYSTEM	P	5	NOTE-1							
27	RI - 2777 A-2722	EVAPORATION SYSTEM	P	5	NOTE-1							
27	RI - 2778 A-2722	EVAPORATION SYSTEM MIXER	P	5	NOTE-1							
27	RI - 2780 A-2722	EVAPORATION SYSTEM PUMP	P	5	NOTE-1							
27	RI - 2781 A-2722	EVAP. SYSTEM	P	5	NOTE-1							
27	KC - 2782 P-2713A/B	BACKWASH PUMP TIMER	P	5	NOTE-1							AUTO/ON/OFF
27	RI - 2782 P-2713A/B	BACKWASH PUMP	P	5	NOTE-1							SELECT/AUTO/S/S

242

CONTRACT: 15-1910 CONOCO/UDE  
 INSTRUMENT ENGINEER: B.P. SERNA

MASTER INSTRUMENT INDEX  
 -----

FOSTER WHEELER ENERGY CORP.  
 LIVINGSTON, N. J.

REVISION 00      DATE 03/23/81      AREA 27      WASTEWATER TREATMENT      -MISC      SHEET NUMBER 034

R E V	A R E L I N E N U M B E R	TAG NUMBER SERVICE	LOCN EFC	REQ NO P.O. NO	VENDOR NAME	PROC AIR	ELEC	WINTN	PIPG	INSTR	REMARKS
						DET.	PIPG	DIAG	DET.	DWG	
						DET.			ISC.	PLAN	
	27	RI - 2791 CL-2703	P 5		NOTE-1						
	27	RI - 2792 A-2716	P 5		NOTE-1						
	27	RI - 2793 A-2706	P 5		NOTE-1						
	27	RI - 2794 A-2706	P 5		NOTE-1						

## 18.9 INSTRUMENT REQUISITIONS (DATA SHEETS)

The following Instrument Requisitions (Data Sheets) are included in this section:

<u>Requisition No.</u>	<u>Description</u>
27-1910-1611A	Thermocouple Assemblies
27-1910-1611B	Temperature Gages
27-1910-1611C	Thermocouple Transmitters
27-1910-1612A	Flow Transmitters
27-1910-1612B	Orifice Plates & Flanges
27-1910-1612E	Rotameters
27-1910-1612G	Venturis
27-1910-1612H	Magnetic Flow Meters
27-1910-1612K	Differential Instruments (Flow)
27-1910-1613A	Level Instruments
27-1910-1613B	Gage Glasses
27-1910-1613C	Differential Instruments (Level)
27-1910-1613D	Level Switches
27-1910-1613E	Sonic Level Instruments
27-1910-1613H	Level Transmitters
27-1910-1614B	Pressure Gages
27-1910-1616K	pH Analyzer
27-1910-1616L	Conductivity Analyzer
27-1910-1616M	Specific Gravity & Density Analyzer
27-1910-1619A	Transducers
27-1910-1621C	Temperature Regulators
27-1910-1622A	Control Valves
27-1910-1623A	Control Valves
27-1910-1624C	Control Valves
27-1910-1625B	Control Valves
27-1910-1625C	Control Valves
27-1910-1639A	Pressure Safety Valves



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1611-A		5 Feb 81	
MATERIAL	THERMOCOUPLES, THERMOWELLS & ASSEMBLIES			C1	5 mar 81	C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1611-A  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 133

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	NOBLE COUNTY, OHIO	ITEM NO.		27-1910-1611-A		5 FEB 81	
MATERIAL	THERMOCOUPLES, THERMOWELLS & ASSEMBLIES			C1	5 MAR 81	C4	
SECTION				C2		C5	
				C3		C6	

- WELL**
- QUANTITY 1 PER TAG #
  - MANUFACTURER \_\_\_\_\_
  - SERIES OR MODEL NO. \_\_\_\_\_
  - CONSTRUCTION: THREADED WELL: TAPERED  
FLANGED WELL: STRAIGHT
  - DRILLED  BUILT-UP  CLOSED END TUBE
  - MATERIAL: 304SS  OTHER AS NOTED
  - I.D. .26"  OTHER \_\_\_\_\_
  - INTERNAL CONN.: FNPT 1/2"  OTHER \_\_\_\_\_
  - EXTERNAL CONN.: MNPT 1"  OTHER \_\_\_\_\_
  - FLANGES: 1 1/2"  OTHER AS NOTED
  - ALL THERMOCOUPLES TO BE MINERAL INSULATED, SPRING LOADED AND BOTTOMED IN THEIR THERMOWELL

- ELEMENT**
- CALIBRATION: J  K  OTHER \_\_\_\_\_ GAUGE 14AWG
  - SHEATH MAT'L. 304SS  OTHER AS NOTED
  - SHEATH O.D. 1/4"
  - GROUNDING: GROUNDED  UNGROUNDED
- HEAD**
- TYPE: MAT'L: ALUM COVER: SCD W/CHAIN
  - CONDUIT CONN: 3/4"  1/2"
  - NIPPLE CONN: 1/2"  OTHER \_\_\_\_\_
  - TERM. BLOCK: SINGLE  DUPLEX  ASBESTOS
- FITTINGS**
- NIPPLES: 1/2"  OTHER \_\_\_\_\_
  - UNION 1/2"  OTHER \_\_\_\_\_

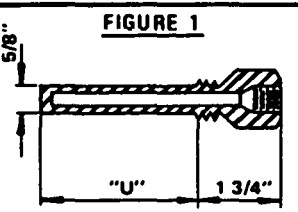


FIG. 1A: TEST WELL WITH PLUG AND CHAIN

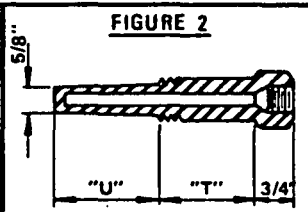


FIG. 2A: TEST WELL WITH PLUG AND CHAIN

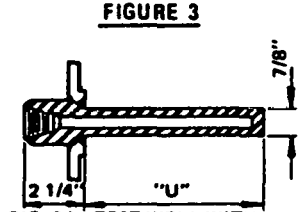


FIG. 3A: TEST WELL WITH PLUG AND CHAIN

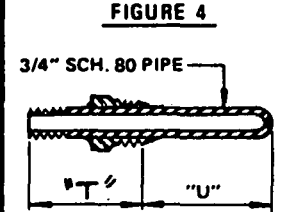


FIG. 4A: TEST WELL WITH PLUG AND CHAIN

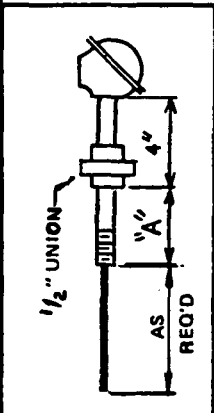


FIGURE 5

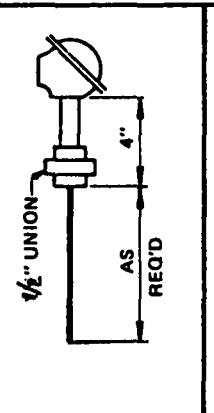


FIGURE 6

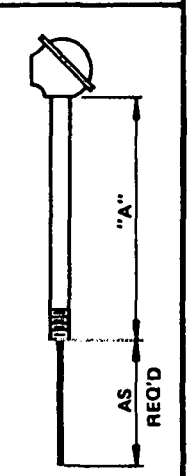


FIGURE 7

FORM NO. 135-604A

TAG NO.	LINE OR EQUIPMENT NO.	FIG. NO.		WELL		ELEMENT		NOTES
		WELL	ELEM.	"U"	"T"	CONN. *	MATERIAL *	
TE-2702	D-2701	3	5	18	-	1/2" 150 RF		NAOH LIQ.
TE-2705	D-2702	3	5	18		1/2" 150 RF	Alloy 20	H2SO4 LIQ.
TE-2757	TK-2701	3	5	18		1/2" 150 RF		
TE-2756	TK-2717	3	5	18		1/2" 150 RF		
TE-2761	TK-2702	3	5	18		1/2" 150 RF		

NOTES: \* USED ONLY WHEN "OTHER" IS CHECKED ON LINES 6, 8, OR 10.  
IF SOLID CONDUIT IS USED, ADD UNIONS TO FIG. 5 & FIG. 7.

BY WXP P.O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 1 OF 2

CLIENT: CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE Noble County, Ohio	ITEM NO.	27-1910-1611-13	5 FEB 81
MATERIAL TEMPERATURE INDICATORS AND WELLS	C1	5 MAR 81	C4
	C2		C5
<b>DOCUMENTATION REQUIREMENTS</b>	C3		C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE:

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- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1611-13  
 FWEC P.O. NO.

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 13B

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

**GENERAL NOTES**

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FORM NO. 135-699A







# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 3

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.		27-1910-1611-C	5 FEB 81
MATERIAL	THERMOCOUPLE TRANSMITTERS			C1	C4
				C2	C5
				C3	C6

### DOCUMENTATION REQUIREMENTS

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER	2		
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

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- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
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- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1611-C  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 138

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
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### GENERAL NOTES

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- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-899A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 3

CLIENT		Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE		Noble County, Ohio		ITEM NO.		27-1910-1611-C		5 FEB 81	
MATERIAL		TEMPERATURE INSTRUMENTS-		C1		C4			
		THERMOCOUPLE TRANSMITTERS		C2		C5			
				C3		C6			
GENERAL	1	TAG NO./QTY.	TT-2702   1	TT-2705   1	TT-2751   1	TT-2766   1			
	2	SERVICE	CAUSTIC DRUM	ACID DRUM	SlipOil	SLUDGE			
	3	LINE NO. OR EQUIPMENT NO.	D-2702	D-2701	TK-2701	TK-2717			
	4	FUNCTION: X-MT./CONT./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	5	MANUFACTURER							
	6	SERIES OR MODEL NO.							
	7	MOUNTING: 2" YOKE/FLUSH/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	8	ELECTRICAL CLASSIFICATION							
	9	SUPPLY: 24VDC/20 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
LOCAL	10	CHART/DIAL: 12" CIRC/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	11	CHART DRIVE/SPEED							
	12	CHART/DIAL RANGE							
	13	CHART/DIAL SPAN							
	14	Enclosure (EFC CLASS)	NEMA 4	NEMA 4	I-D-2	NEMA 4			
	15	Intrinsically Safe	YES	YES		YES			
CONTROLLER	16	CONTROL: P/I/D/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	17	INC. VAR. - OUTPUT: INC./DEC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	18	AUTO/MAN. SWITCH: YES/NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	19	S.P. ADJ.: MAN./REMOTE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	20	AIR/ELECT. CONNECTION							
	21	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
XMTR.	23	TC. Type Input	J	J	J	J			
	24	PROCESS DATA: T NORM./T MAX.	60°F	60°F	180°F	60°F			
	25	Output (Linear)	4-20ma	4-20ma	4-20ma	4-20ma			
	26	RANGE (Calibration) °F	0-100°F	0-100°F	50-250°F	0-100°F			
	27	SPAN °F	100°F	100°F	200°F	100°F			
	28	TC. Burnout Protection	UP SCALE	UP SCALE	UP SCALE	UP SCALE			
	29	Input-Output Isolation	YES	YES	YES	YES			
	30	Cold Junction Comp.	YES	YES	YES	YES			
	31	Min. Input Impedance	1 Megohm	1 Megohm	1 Megohm	1 Megohm			
	32	Adjustable Zero & Span	Yes	Yes	Yes	Yes			
	33	Accuracy	± 1%	± 1%	± 1%	± 1%			
	34								
35									
36	Conduit Connection	1/2 NPT (F)	1/2 NPT (F)	1/2 NPT (F)	1/2 NPT (F)				
37	Sensor Connection	1/2 NPT (F)	1/2 NPT (F)	1/2 NPT (F)	1/2 NPT (F)				
38									
SWITCHES	39	NUMBER/FORM							
	40	RATING							
OPTIONS	41								
	42	FILT. REG./SUP.GAGE/OUT. GAGE*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	43	OUTPUT METER: INTEGRAL/REMOTE	<input type="checkbox"/> 3 1/2"	<input type="checkbox"/> 3 1/2"	<input type="checkbox"/> 3 1/2"	<input type="checkbox"/> 3 1/2"			
	44	Meter Scale	0-100%	0-100%	0-100%	0-100%			
45									
NOTES: FOR GENERAL NOTES SEE REQ 1910 -1600A									
* ALL PNEUMATIC ITEMS PIPED & MOUNTED.									
BY <u>WVA</u>			P. O. NO.			VENDOR			

FORM NO. 135-602A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 3

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1611-C		5 Feb 81	
MATERIAL	TEMPERATURE INSTRUMENTS-			C1		C4	
	THERMOCOUPLE TRANSMITTERS			C2		C5	
				C3		C6	

GENERAL	1	TAG NO./QTY.	TT-2761	1				
	2	SERVICE	SLOP OIL					
	3	LINE NO. OR EQUIPMENT NO.	TK-2702					
	4	FUNCTION: X-MT./CONT./OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5	MANUFACTURER						
	6	SERIES OR MODEL NO.						
	7	MOUNTING: 2" YOKE/FLUSH/OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8	ELECTRICAL CLASSIFICATION						
	9	SUPPLY: 24VDC/20 PSIG/OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOCAL	10	CHART/DIAL: 12" CIRC/OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	11	CHART DRIVE/SPEED						
	12	CHART/DIAL RANGE						
	13	CHART/DIAL SPAN						
	14	Enclosure ELE Class	I-D-2					
	15	Intrinsically Safe	YES					
CONTROLLER	16	CONTROL: P/I/D/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	17	INC. VAR. - OUTPUT: INC./DEC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	18	AUTO/MAN. SWITCH: YES/NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	19	S.P. ADJ.: MAN./REMOTE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	20	AIR/ELECT. CONNECTION						
	21	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XMTR.	23	TC. Type Input	J					
	24	PROCESS DATA: T NORM./T MAX.	180°F					
	25	Output (Linear)	4-20mA					
	26	RANGE (Calibration) °F	50-250°F					
	27	SPAN °F	200°F					
	28	TC. Burnout Protection	UPSCALE					
	29	Input-Output Isolation	YES					
	30	Cold Junction Comp.	YES					
	31	Min. Input Impedance	1 Megohm					
	32	Adjustable Zero & Span	Yes					
33	Accuracy	± 1%						
34								
35								
36	Conduit Connection	1/2 NPT (F)						
37	Sensor Connection	1/2 NPT (F)						
38								
SWITCHES	39	NUMBER/FORM						
	40	RATING						
OPTIONS	42	FILT. REG./SUP.GAGE/OUT. GAGE*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	43	OUTPUT METER: INTEGRAL/REMOTE	<input checked="" type="checkbox"/>	3 1/2"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	44	Meter Scale	0-100%					
45								

NOTES: FOR GENERAL NOTES SEE REQ 1910 -1600A  
 \* ALL PNEUMATIC ITEMS PIPED & MOUNTED.

BY	WLA	P. O. NO.		VENDOR	
----	-----	-----------	--	--------	--

FORM NO. 135-602A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1612-A		2 Feb 01	
MATERIAL	DIFFERENTIAL INSTRUMENTS			C1	6 mac 81	C4	
	FLOW TRANSMITTERS			C2		C5	
	DOCUMENTATION REQUIREMENTS			C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	<u>LATER</u>	<u>2</u>		
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

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 FWEC REQ'N. NO. 27-1910-1612-A  
 FWEC P.O. NO. \_\_\_\_\_  
 FOR: CONOCO/DOE

Pipeline Gas Demonstration Plant  
Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
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FORM NO. 135-699A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 2

CLIENT		CONOCO/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE		Noble County, Ohio		ITEM NO.		27-1910-1612-A		2 Feb 81	
MATERIAL		DIFFERENTIAL INSTRUMENTS		C1		6 MAR 81		C4	
		FLOW TRANSMITTERS		C2				C5	
SERVICE				C3				C6	
GENERAL	1	TAG NO./QTY.	FT-2704   1	FT-2741   1					
	2	SERVICE	H <sub>2</sub> O EFFLUENT	FILT EFFLUENT					
	3	LINE NO. OR EQUIPMENT NO.	9"WW270117LC	9"WW270311LC					
	4	FUNCTION: X-MT./CONT./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5	MANUFACTURER	ROSEMOUNT	ROSEMOUNT					
	6	SERIES OR MODEL NO.	1151 DP	1151 DP					
	7	MOUNTING: 2" YOKE/FLUSH/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8	ELECT CLASS: CLASS/DIV/GR.	- - -	- - -					
	9	SUPPLY: 24VDC/20 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REMOTE INDICATOR SEE 43	10	CHART/DIAL: 12" CIRC/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11	CHART DRIVE/SPEED	-	-					
	12	CHART/DIAL RANGE	0-10 SQ RT.	0-10 SQ RT.					
	13	SCALE FACTOR	x 25 GPM	x 25 GPM					
XMTR	14	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15	ELECT. CONNECTION	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT
CONTROLLER	16	CONTROL: P/I/D/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	17	INC.VAR. - OUTPUT: INC./DEC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	18	AUTO/MAN SWITCH: YES/NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	19	S.P. ADJ.: MAN./REMOTE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	20	AIR/ELECT. CONNECTION							
	21	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELEMENT	23	VARIABLE: FLOW/DIFF.PRESS./OTHER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	24	TYPE: FORCE BAL./MOTION BAL./OTHER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	25	BODY MAT'L: C.S./ 316 S.S./OTHER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	26	ELEMENT MAT'L: 316 S.S./OTHER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	27	RATING: 1500 PSIG/OTHER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	28	DIFF. RANGE	0-100" W.C.	0-100" W.C.					
	29	SPAN	100" W.C.	100" W.C.					
	30	OVERRANGE PROTECTION TO:							
	31	PROCESS DATA: T. NORM./T. MAX. °F	100	100					
	32	PROCESS DATA: P. NORM./P. MAX. PSIA	39	44	64	74			
	33	PROCESS DATA: SG/SGs	**	**					
	34	PROCESS CONNECTIONS HI/LO PRES	1/4" FNPT	1/4" FNPT					
35	ELEVATION	**	**						
36	SUPPRESSION	**	**						
37									
38									
CAPILLARY SEALS	39	FLANGES: 300# 3" RF/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	40	CAPILLARY LENGTH: FT							
	41	FILL LIQUID:							
OPTIONS	42	FILT. REG./SUP. GAGE/OUT. GAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	43	OUTPUT METER: INTEGRAL/REMOTE	<input checked="" type="checkbox"/>	3 1/2" DIA	<input checked="" type="checkbox"/>	3 1/2" DIA	<input checked="" type="checkbox"/>	3 1/2"	<input checked="" type="checkbox"/>
	44	INTRINSIC SAFETY REQ'D	YES	YES	YES	YES	YES	YES	YES
	45	INTEGRAL J-BOX REQ'D	YES	YES	YES	YES	YES	YES	YES

NOTES: FOR GENERAL NOTES SEE REQ -1600A  
 \* ALL PNEUMATIC ITEMS PIPED & MOUNTED  
 \*\* IF LINE 23 IS "LEVEL", SEE RIGHT →  
 IF LINE 23 IS OTHER THAN LEVEL, SG ONLY IS USED.

SUPPRESSION = L.P. HEAD - H.P. HEAD  
 = H x SGs  
 SPAN = Hi.L.L. HEAD - Lo.L.L. HEAD  
 = L x SG  
 SG IS AT T. NORM.  
 SGs IS AT AMBIENT TEMP.

BY
P. O. NO.
VENDOR

FORM NO. 135-610A



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1612-B		10 Dec 80	
MATERIAL	ORIFICE FLANGES AND PLATES	C1		6 MAR 81		C4	
		C2				C5	
		C3				C6	

**DOCUMENTATION REQUIREMENTS**

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1612-B  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 135

- 1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
- 2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
- 3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

**GENERAL NOTES**

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION** PAGE 2 OF

CLIENT CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE NOBLE COUNTY, OHIO	ITEM NO.	27-1910-1612-B	10 Dec 80
MATERIAL ORIFICE FLANGES AND PLATES		C1	C4
		C2	C5
SERVICE		C3	C6

- ORIFICE FLANGES**
1. NO. OF PAIRS REQUIRED ONE (1) EACH TAG NO
  2. MANUFACTURER \_\_\_\_\_
  3. MATERIAL: A. C.S. (ASTM A105)  
 B. 1/2 Mo (ASTM A182 GR. F1).  
 C. 31033 (ASTM A182 GR. F316)  
 D. OTHER (SEE "NOTES" COLUMN)
  4. FLANGE SPEC: ANSI B16.36
  5. FLANGE TYPE: WELD NECK  SLIP ON - WHEN NOTED
  6. TAP SIZE: 1/2"  3/4"
  7. TAP CONN.: NPT
  8. TYPE TAPS: VENA CONTRACTA  FLANGE  PIPE
  9. ACCESSORIES: JACK SCREWS  GASKETS
  10. NIPPLES
  11. GASKETS (TO SPECIFICATION \_\_\_\_\_)
  12. BOLTS AND NUTS (TO SPEC. \_\_\_\_\_)
  13. FLANGE FINISH: STOCK FINISH <sup>(4)</sup>

- ORIFICE PLATES**
1. NO. REQUIRED ONE (1) EACH TAG NO
  2. STANDARD: API RP 550
  3. MATERIAL: 316 SS
  4. RING MATERIAL AND TYPE \_\_\_\_\_
  5. TYPE: CONCENTRIC
  6. 1/8" VENT OR DRAIN AS NOTED
- NOTES: 1. BARSTOCK PLUGS TO BE PROVIDED IN ALL PRESSURE TAPS.  
 2. EACH ORIFICE FLANGE TO BE STAMPED WITH TAG NO., SIZE & MATERIAL RATING.  
 3. SHIP EACH PAIR OF FLANGES WITH TWO HOLDING BOLTS.  
 4. STOCK FINISH REFERS TO FINISH SPECIFIED IN RELEVANT FLANGE TABLE.
- SEE BELOW FOR ADDITIONAL NOTES.

TAG NO.	SIZE	PIPE SCH	RATING		MAT'L	LINE		BORE	PIPE ID	NOTES	F.S.
			300# RF	OTHER		NUMBER	SPEC				
FE-2704	4	40	✓	SLIP ON	A	4"WW270117	LC	SEE NOTE 5 BELOW	4.026	1 THRU 6	
FE-2734	3	40	✓	SLIP ON	A	3"AP270220	LC		3.068		
FE-2741	4	40	✓	SLIP ON	A	4"WW270311	LC		4.026	↓	
FE-2701	4	40	✓	SLIP ON	A	4"AP270219	LC		4.026	1 THRU 6	
FE-2718	6	40	✓	SLIP ON	A	6"AP270229	LC		6.065	1 THRU 6	

- NOTES: 5. VENDOR TO PROVIDE COMPUTER CALCULATIONS AS PER ATTACHED DATA SHEET AND SHALL BE RESTRICTED TO A  $\beta$  WITHIN 0.3 to 0.7.  
 6. TAG NO., MATERIAL, BORE AND PIPE ID SHALL BE STAMPED ON EACH ORIFICE HANDLE (UPSTREAM SIDE).

BY WA P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_

FORM NO. 135-613A

PROCESS/FLOW METER DATA

SECTION \_\_\_\_\_

TAG NUMBER	SERVICE (FLUID)	COMP. FACT.	OPERATING CONDITIONS OF PSIA		VISC. CPS @ T	MOL. WT.	ORIFICE ΔP (IN. H <sub>2</sub> O)	PIPE ID (INCH.)	SIZING FLOW (NORM. +43%) SEE NOTE 1	SPECIFIC GRAVITY @ 60°F @ T		APPROX. <b>B</b>
FE-2704	H <sub>2</sub> O		180	37.0	1.0	18	100	4.026	250 GPM	1.0	1.0	0.64
FE-2734	AIR	0.97	175	23.0	0.02	28.4	20	3.068	250 SCFM			0.622
FE-2741	H <sub>2</sub> O		100	64.0	1.0	18	100	4.026	250 GPM	1.0	1.0	0.64
FE-2701	AIR	.97	176	23	.02	29	50"	4.026	700 SCFM			0.58
FE-2718	AIR	1.0	175	23	.02	29	50"	6.065	2000 SCFM			0.64

NOTES: 1. SIZING FLOW EXPRESSED IN LBS./HR., SCFH OR GPM @ 60°F AS NOTED.

256

CHANGE NO. 1 DATE 10 Dec 80 REQUISITION NO. 27-1910-1612-B



FOSTER WHEELER ENERGY CORPORATION REQUISITION





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1612-E		2 FEB 81	
MATERIAL	ROTAMETERS			C1	6 MAEB1	C4	
	(VARIABLE AREA FLOWMETERS)			C2		C5	
	DOCUMENTATION REQUIREMENTS			C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1612-E  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 133

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION** PAGE 2 OF 3

CLIENT		CONOCO/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE			
SITE		Noble County, Ohio		ITEM NO.		27-1910-1612-E		2 FEB 81			
MATERIAL				ROTAMETERS				C1	C4		
				(VARIABLE AREA FLOWMETERS)				C2	C5		
								C3	C6		
GENERAL	1	TAG NUMBER/QUANTITY		FI-2702	1	FI-2703	1	FI-2711	1	FI-2763	1
	2	SERVICE		LEVEL BUBBLER		LEVEL BUBBLER		LEVEL BUBBLER		WATER FLOW	
	3	LINE NO./VESSEL NO.		D-2702		D-2701		D-2703		2WU2706 HLC	
	4	MANUFACTURER OR EQUAL		WALLACE TIERMAN		WALLACE TIERMAN		WALLACE TIERMAN		WALLACE TIERMAN	
	4A	SERIES OR MODEL NO. TUBE/FLOAT		DO 26		DO 26		DO 26		A 106	
	5	MOUNTING		IN LINE		IN LINE		IN LINE		IN LINE	
	6	SUPPLY: 20PSIG/___VDC/___V___HZ		□□□		□□□		□□□		□□□	
	7	CONN. SIZE AND RATING: INLET/OUTLET		1/4NPT 1/4NPT		1/4NPT 1/4NPT		1/4NPT 1/4NPT		1/4NPT 1/4NPT	
	8	INLET DIR.   OUTLET DIR.		HORIZ HORIZ		HORIZ HORIZ		HORIZ HORIZ		HORIZ HORIZ	
	9	FITTING MATERIAL		316 SS		316 SS		316 SS		316 SS	
	10	PACKING OR O-RING MATERIAL		BUNA-N		BUNA-N		BUNA-N		BUNA-N	
METER	12	SIZE DIA / LENGTH			6"		6"		6"		6"
	13	TUBE MATERIAL   FLOAT MATERIAL									
	14	METER SCALE LENGTH & TYPE		6" INTEGRAL		6" INTEGRAL		6" INTEGRAL		6" INTEGRAL	
	15	METER SCALE RANGE		0-80 SCCM		0-80 SCCM		0-80 SCCM		0-26 GPM	
	16	METER FACTOR		1		1		1		1	
	17	RATED ACCURACY		2% F.S.		2% F.S.		2% F.S.		2% F.S.	
	18	HYDR. CALIB. REQUIRED %		NO -		NO -		NO -		NO -	
	19	FLUID		AIR		AIR		AIR		WATER	
FLUID DATA	20	COLOR OR TRANSPARENCY		CLEAR		CLEAR		CLEAR		CLEAR	
	21	MAXIMUM FLOW RATE		80 SCCM		80 SCCM		80 SCCM		25 GPM	
	22	NORMAL FLOW RATE		20 SCCM		20 SCCM		20 SCCM		19 GPM	
	23	SG @ 60°F   SG @ F.T.		1   1		1   1		1   1		1   1	
	24	MW   VIS. @ F.T. (CPS.)		28.97		28.97		28.97		28.97	
	25	TEMP. °F NORMAL   °F MAXIMUM		100		100		100		70   100	
	26	PRESS. (PSIG) NORM.   MAXIMUM		100   140		100   140		100   140		75   95	
	27	ALLOWABLE PRESSURE DROP									
EXTENSION	28	EXTENSION WELL MTL.		X							
	29	EXTENSION GASKET MTL.		X							
XMTR.	30	TRANSMITTER OUTPUT		X							
	31	TRANS. ELECT. CLASS.		X							
ALARM	32	SCALE RANGE		X							
	33	NO. OF CONTACTS   FORM		X							
	34	RATING   HOUSING ELEC. CLASS.		X							
OPTIONS	35			X							
	36	VALVE SIZE AND MATERIAL		INTEGRAL/316SS		INTEGRAL/316SS		INTEGRAL/316SS		INTEGRAL/316SS	
	37	VALVE LOCATION *SLOTTED INLET		BOTTOM-INLET		BOTTOM-INLET		BOTTOM-INLET		BOTTOM-INLET	
	38	CONST. DIFF. RELAY *MAT'L.		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	39	PURGE METER TUBING /MAT'L.		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	40	AIRSET									
	41										
	42										
44											

NOTES: \* DIFF. RELAY PIPED & MOUNTED

BY WWT P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_

FORM NO. 135-612 A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 3

CLIENT		CONTRACT NO.		REQUISITION NO.		DATE										
CONOCO/DOE		15-1910		27-1910-1612-E		2 FEB 81										
SITE		ITEM NO.		C1		C4										
Noble County, Ohio				6 MAR 81												
MATERIAL				C2		C5										
ROTAMETERS (VARIABLE AREA FLOWMETERS)																
				C3		C6										
GENERAL	1 TAG NUMBER/QUANTITY	FI-2714	1	FI-2715	1	FI-2731	1	FI-2761	1							
	2 SERVICE	SERVICE H <sub>2</sub> O							→							
	3 LINE NO./VESSEL NO.	1" WU270212LC		1" WU270220LC		1" WU20304LC		2" WU270612LC								
	4 MANUFACTURER OR EQUAL	WALLACE-TIERMAN							→							
	4A SERIES OR MODEL NO.	WT-1-40-G-10 1-Q-10V1-91							→							
	5 MOUNTING	IN LINE							→							
	6 SUPPLY : 20PSIG/ VDC/ V HZ	□□□ - □□□ □□□ □□□							→							
	7 CONN. SIZE AND RATING INLET/OUTLET	1" NPT 1" NPT							→							
	8 INLET DIR.   OUTLET DIR.	VERT   VERT							→							
	9 FITTING MATERIAL	316 SS							→							
	10 PACKING OR O-RING MATERIAL	BUNA-N							→							
METER	12 SIZE DIA / LENGTH	1"   10"						→								
	13 TUBE MATERIAL   FLOAT MATERIAL	GLASS   316SS						→								
	14 METER SCALE LENGTH & TYPE	10" DETACHED							→							
	15 METER SCALE RANGE	0-12							→							
	16 METER FACTOR	1							→							
	17 RATED ACCURACY	2% F.S.							→							
	18 HYDR. CALIB. REQUIRED %	NO - NO - NO -							→							
	FLUID DATA	19 FLUID	WATER							→						
20 COLOR OR TRANSPARENCY		CLEAR							→							
21 MAXIMUM FLOW RATE		11 GPM							→							
22 NORMAL FLOW RATE		8.6 GPM							→							
23 SG @ 60°F   SG @ F.T.		1.0   1.0							→							
24 MW   VIS. @ F.T. (CPS.)		18   1.0							→							
25 TEMP. °F NORMAL   °F MAXIMUM		60							→							
26 PRESS. (PSIG) NORM.   MAXIMUM		75   95							→							
27 ALLOWABLE PRESSURE DROP	20" H <sub>2</sub> O							→								
EXTENSION	28 EXTENSION WELL MTL.	X														
	29 EXTENSION GASKET MTL.															
	30 TRANSMITTER OUTPUT															
XMTR.	31 TRANS. ELECT. CLASS.															
	32 SCALE RANGE															
	33 NO. OF CONTACTS   FORM															
ALARM	34 RATING   HOUSING ELEC. CLASS.															
	35															
OPTIONS	36 VALVE SIZE AND MATERIAL	X														
	37 VALVE LOCATION															
	38 CONST. DIFF. RELAY */MAT'L.								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	39 PURGE METER TUBING /MAT'L.								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	40 AIRSET															
	41															
	42															
	43															
44																
NOTES: * DIFF. RELAY PIPED & MOUNTED																
BY: <u>WWA</u>		P. O. NO.		VENDOR												

FORM NO. 135-612 A



# REQUISITION

SECTION 2700

WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1612-G		12 Dec 80	
MATERIAL	VENTURI			C1	6 MAR 81	C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

	TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A.	OUTLINE DIMENSIONS	<u>LATER</u>	_____	_____	_____
B.	WIRING DIAGRAMS	_____	_____	_____	_____
C.	PIPING DIAGRAMS	_____	_____	_____	_____
D.	CALCULATION OR CALIBRATION	_____	_____	_____	_____
E.	DATA BOOK MATERIAL <sup>3</sup>	_____	_____	_____	_____

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:


TAG NO. : As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1612-G  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 139

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE: 

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 2

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	1910-1612-G	12 Dec 80
MATERIAL	VENTURI		C1 6 MAR 81	C4
OR			C2	C5
SERVICE			C3	C6
1	Tag No. / QUAN.	FE-2712	1	FE-2713
2	Service	EQUALIZATION EFFLUENT-H <sub>2</sub> O		EQUALIZATION EFFLUENT-H <sub>2</sub> O
3	Line No.	4"WW270117 LC		4"WW270201 LC
General	4 Manufacturer	VICKERY - Simms		VICKERY - Simms
5	Model No.	FAB - TYPE		FAB - TYPE
6				
7				
8				
9	Sensor Mat'l	CARBON STEEL		CARBON STEEL
10	Instr. Connection	1/2" NPT FEMALE		1/2" NPT FEMALE
	valves	316 SS VALVES		316 SS VALVES
Body	11 Mounting	300# RF FLANGES		300# RF FLANGES
12				
13				
14				
15				
16				
17	Fluid	H <sub>2</sub> O EFFLUENT		H <sub>2</sub> O EFFLUENT
18	Flow: Normal	38,000#/HR (76 GPM)		38,000#/HR (76 GPM)
19	Max. (sizing)	57,000#/HR (114 GPM)		57,000#/HR (114 GPM)
20	Temp: Normal	AMB (100°F)		AMB (100°F)
21	Max. / MIN			
Service	22 Press: Normal	20 psia		20 psia
23	Max.			
Conditions				
24	Sp. Gr: Operating	1.0		1.0
25	@ 60°F	1.0		1.0
26	Mol. Wt.			
27	Visc. @ Flowing Cond.	1.0		1.0
28				
29	Pipe: Size/Sch./Mat'l	4 / 40 / CS		4 / 40 / CS
30				
31				
32				
33				
34	Approx. Diff. Press.	20" W.C.		20" W.C.
AP	35 PRECISE CALC.	SEE NOTE 2		SEE NOTE 2
36				

- Notes:
- Each unit shall be shipped factory-assembled complete with valving and fittings ready for installation.
  - Provide Calculation of differential pressure for specified conditions above.

FCF NO. 135-950

BY WVA P.D.NG. SUPPLIER



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	27-1910-1612-H	12 Dec 80
MATERIAL	Magnetic Flow Meters		C1 6 MAR 81	C4
			C2	C5
<b>DOCUMENTATION REQUIREMENTS</b>			C3	C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER →	_____	_____	_____
B. WIRING DIAGRAMS	_____	_____	_____	_____
C. PIPING DIAGRAMS	_____	_____	_____	_____
D. CALCULATION OR CALIBRATION	_____	_____	_____	_____
E. DATA BOOK MATERIAL <sup>3</sup>	_____	_____	_____	_____

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE:

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	As shown on following pages
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1612-H
FWEC P.O. NO.	_____
FOR:	CONOCO/DOE Pipeline Gas Demonstration Plant Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

**GENERAL NOTES**

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-689A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE	Noble County, Ohio		ITEM NO.		27-1910-1612-H		12 Dec 80	
MATERIAL	Magnetic Flow Meters				C1	6 MAR 81	C4	
					C2		C5	
					C3		C6	
GENERAL	1	TAG NUMBER/QUANTITY	FY-2736 1					
	2	SERVICE	ACTIVATED SLUDGE					
	3	LINE NO./VESSEL NO.	2 DM 27025 LC					
	4	MANUFACTURER OR EQUAL	FOXBORO					
	4A	SERIES OR MODEL NO.	2800-1" Seales Co.					
	5	Electrical Classification	-					
	6							
	7							
	8							
	9							
	10							
METER	12	SIZE	Schedule	2	80			
	13	TUBE MATERIAL	Liner MATERIAL	304SS	TFE			
	14	Electrodes: 316S.S./other		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	15	Conn. Rating/Type	300#	RF				
	16	Supply Volt. 110 V 60 HZ		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	17	RATED ACCURACY	± F.S.	1-1/2				
	18	HYDR. CALIB. REQUIRED	%	-				
	19	FLUID	SLUDGE					
FLUID DATA	20	Conductivity (µMHOS)	±					
	21	MAXIMUM FLOW RATE	20 Gpm					
	22	NORMAL FLOW RATE	2 Gpm					
	23	SG @ 60°F   SG @ F.T.	1.0	1.0				
	24	MW   VIS. @ F.T. (CPS.)	±	34				
	25	TEMP. °F NORMAL   °F MAXIMUM	100	-				
	26	PRESS. (PSIG) NORM.   MAXIMUM PSIA	24	-				
	27	Velocity (Ft./Sec.)						
28	% Solids	± 3-6%						
XMTR.	29	Convert Out. 4-20mA/other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	30	Calibrated Range						
	31	Trans./Convert Cable lgth	750	Ft.	Ft.	Ft.	Ft.	
	32	Mounting: 2" pipe/other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
ALARM	33	NO. OF CONTACTS   FORM						
	34	RATING   HOUSING ELEC. CLASS.						
	35							
OPTIONS	36	Grounding Rings/Mat'l	<input checked="" type="checkbox"/>	316SS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	37	Ultrasonic Cleaning	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	38	Auto Zeroing	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	39							
	40							
	41							
	42							
	43							
44								
NOTES: A. Manufacturer to tag MV-Current converter as FY-2736, using same loop number as associated transmitter.								
± APPROX = TO								
± DATA TO BE SUPPLIED OR CONFIRMED LATER								
BY	W W A		P. O. NO.			VENDOR		

FORM NO. 135-612 A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.		27-1910-1612-K	2 Feb 81
MATERIAL	DIFFERENTIAL INSTRUMENTS	C1		6 MAR 81	C4
	FLOW INDICATORS	C2			C5
	DOCUMENTATION REQUIREMENTS	C3			C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

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- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1612-K  
 FWEC P.O. NO. \_\_\_\_\_  
 FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

**GENERAL NOTES**

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-889A





# REQUISITION

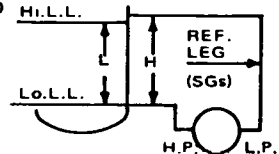
FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 3

CLIENT		CONOCO/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE		Noble County, Ohio		ITEM NO.		27-1910-1612-K		2-FEB 81	
MATERIAL		DIFFERENTIAL INSTRUMENTS		C1		6 MAR 81		C4	
		FLOW INDICATORS		C2				C5	
SERVICE				C3				C6	
GENERAL	1	TAG NO./QTY.	FI-2701   1	FI-2712   1	FI-2713   1	FI-2718   1			
	2	SERVICE	AIR	H <sub>2</sub> O EFFLUENT	H <sub>2</sub> O EFFLUENT	AIR			
	3	LINE NO. OR EQUIPMENT NO.	4AP270219LC	4WW270117LC	4WW270201LC	6AP270229LC			
	4	FUNCTION: X-MT./CONT./OTHER	<input type="checkbox"/> INDICATE	<input type="checkbox"/> INDICATE	<input type="checkbox"/> INDICATE	<input type="checkbox"/> INDICATE			
	5	MANUFACTURER	BARTON	BARTON	BARTON	BARTON			
	6	SERIES OR MODEL NO.	316	316	316	316			
	7	MOUNTING: 2" YOKE/FLUSH/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	8	ELECTRICAL CLASSIFICATION	-	-	-	-			
	9	SUPPLY: 24VDC/20 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
LOCAL	10	CHART/DIAL: 12" CIRC/OTHER	<input type="checkbox"/> 3 1/2" DIA (MIN)	<input type="checkbox"/> 3 1/2" DIA (MIN)	<input type="checkbox"/> 3 1/2" DIA (MIN)	<input type="checkbox"/> 3 1/2" DIA (MIN)			
	11	CHART DRIVE/SPEED	-	-	-	-			
	12	CHART/DIAL RANGE	0-10 SQRT.	0-10 SQRT.	0-10 SQRT.	0-10 SQRT.			
	13	SCALE FACTOR	X 70 SCFM	X 15 GPM	X 15 GPM	X 200 SCFM			
XMTR	14	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	15	AIR/ELECT. CONNECTION							
CONTROLLER	16	CONTROL: P/I/D/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	17	INC.VAR. - OUTPUT: INC./DEC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	18	AUTO/MAN.SWITCH: YES/NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	19	S.P. ADJ.: MAN./REMOTE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	20	AIR/ELECT. CONNECTION							
	21	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	22								
ELEMENT	23	VARIABLE: FLOW/DIFF.PRESS./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	24	TYPE: FORCE BAL./MOTION BAL./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	25	BODY MAT'L: C.S./316 S.S./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	26	ELEMENT MAT'L: 316 S.S./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	27	RATING: 1500 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	28	DIFF. RANGE	0-50" W.C.	0-50" W.C.	0-50" W.C.	0-50" W.C.			
	29	SPAN	50" W.C.	5.0	5.0	50" W.C.			
	30	OVERRANGE PROTECTION TO:							
	31	PROCESS DATA: T NORM./T MAX. °F	175	100	100	175			
	32	PROCESS DATA: P NORM./P MAX. PSIG	23	20	20	23			
	33	PROCESS DATA: SG/SGs	**						
	34	PROCESS CONNECTIONS Hi AND Lo	1/4" FNPT	1/4" FNPT	1/4" FNPT	1/4" FNPT			
	35	ELEVATION	**	-	-	-			
	36	SUPPRESSION	**	-	-	-			
37									
38									
SWITCHES	39	NUMBER/FORM							
	40	HATING							
	41								
OPTIONS	42	FILT. REG./SUP. GAGE/OUT. GAGE *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	43	OUTPUT METER: INTEGRAL/REMOTE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	44								
	45								

FORM NO. 135-610A

NOTES: FOR GENERAL NOTES SEE REQ 1910-1600A  
 \* ALL PNEUMATIC ITEMS PIPED & MOUNTED  
 \*\* IF LINE 23 IS "LEVEL", SEE RIGHT →  
 IF LINE 23 IS OTHER THAN LEVEL, SG ONLY IS USED.

SUPPRESSION = L.P. HEAD - H.P. HEAD  
 = H x SGs  
 SPAN = Hi.L.L. HEAD - Lo.L.L. HEAD  
 = L x SG  
 SG IS AT T NORM.  
 SGs IS AT AMBIENT TEMP.



BY WWA

P. O. NO.

VENDOR



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 3

CLIENT	CONOCO/DOE		CONTRACT NO.	15-1910		REQUISITION NO.	27-1910-1612-K		DATE	2 FEB 81		
SITE	Noble County, Ohio		ITEM NO.									
MATERIAL	DIFFERENTIAL INSTRUMENTS						C1	6 MAR 81		C4		
	FLOW INDICATORS						C2			C5		
SERVICE							C3			C6		
GENERAL	1	TAG NO./QTY.	FI-2734   1									
	2	SERVICE	AIR									
	3	LINE NO. OR EQUIPMENT NO.	8'AP270220LC									
	4	FUNCTION: X-MT./CONT./OTHER	<input type="checkbox"/> INDICATE <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	5	MANUFACTURER	BARTON									
	6	SERIES OR MODEL NO.	316									
	7	MOUNTING: 2" YOKE/FLUSH/OTHER	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	8	ELECTRICAL CLASSIFICATION	-									
	9	SUPPLY: 24VDC/20 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
LOCAL	10	CHART/DIAL: 12" CIRC/OTHER	<input type="checkbox"/> 3 1/2" DIA MIN <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	11	CHART DRIVE/SPEED	-									
	12	CHART/DIAL RANGE	0-10 SQ. RT.									
	13	SCALE FACTOR	x 25 SCFM									
XMTR	14	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	15	AIR/ELECT. CONNECTION	<input checked="" type="checkbox"/>									
CONTROLLER	16	CONTROL: P/I/D/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	17	INC. VAR. - OUTPUT: INC./DEC.	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	18	AUTO/MAN. SWITCH: YES/NO	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	19	S.P. ADJ.: MAN./REMOTE/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	20	AIR/ELECT. CONNECTION	<input checked="" type="checkbox"/>									
	21	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
ELEMENT	22	VARIABLE: FLOW/DIFF.PRESS./OTHER	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	24	TYPE: FORCE BAL./MOTION BAL./OTHER	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	25	BODY MAT'L: C.S./ 316 S.S./OTHER	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	26	ELEMENT MAT'L: 316 S.S./OTHER	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	27	RATING: 1500 PSIG/OTHER	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	28	DIFF. RANGE	0-20" W.C.									
	29	SPAN	20									
	30	OVERRANGE PROTECTION TO:										
	31	PROCESS DATA: T NORM./T MAX. °F	175									
	32	PROCESS DATA: P NORM./P MAX. PSIG	23									
33	PROCESS DATA: SG/SGs	..										
34	PROCESS CONNECTIONS Hi/Lo Pres	1/4" FNPT										
35	ELEVATION	..										
36	SUPPRESSION	..										
SWITCHES	39	NUMBER/FORM	<input checked="" type="checkbox"/>									
	40	RATING	<input checked="" type="checkbox"/>									
	41		<input checked="" type="checkbox"/>									
OPTIONS	42	FILT. REG./SUP. GAGE/OUT. GAGE *	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	43	OUTPUT METER: INTEGRAL/REMOTE	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	44		<input checked="" type="checkbox"/>									
45		<input checked="" type="checkbox"/>										
NOTES:			FOR GENERAL NOTES SEE REQ -1600A ALL PNEUMATIC ITEMS PIPED & MOUNTED				SUPPRESSION = L.P. HEAD - H.P. HEAD = HxSGs					
..			IF LINE 23 IS "LEVEL", SEE RIGHT →				SPAN = Hi.L.L. HEAD - Lo.L.L. HEAD = LxSG					
..			IF LINE 23 IS OTHER THAN LEVEL, SG ONLY IS USED.				SG IS AT T NORM. SGs IS AT AMBIENT TEMP.					
BY	P. O. NO.		VENDOR									

FORM NO. 135-610A



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-A		4 FEB 81	
MATERIAL	LEVEL INSTRUMENTS-TRANSMITTERS			C1	6 MAR 81	C4	
	(DISPLACER OR FLOAT)			C2		C5	
	DOCUMENTATION REQUIREMENTS			C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:


TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1613-A  
 FWEC P.O. NO. \_\_\_\_\_  
 FOR: CONOCO/DOE

Pipeline Gas Demonstration Plant  
Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 139

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE: 

FORM NO. 135-699A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 2

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-A		4 FEB 81	
MATERIAL	LEVEL INSTRUMENTS-TRANSMITTERS (DISPLACER OR FLOAT)			C1	6 MAR 81	C4	
				C2		C5	
				C3		C6	

GENERAL	1	TAG NO.	QUANTITY	LT-2709	1	LT-2731	1	LT-2733	1		
	2	VESEL OR LINE NO.		A-2707		P-2712A/B		P-2725A/B			
	3	MANUFACTURER	OR EQUAL	Masonellan		Masonellan		Masonellan			
	4	SERIES OR MODEL NO.		12123		12123		12123			
	5	Elect. Class: CL./Div./GR.		- - -		- - -		- - -			
	6	SUPPLY: 24 VDC/20 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
TYPE	7	EXT./INT./DISPL./FLOAT		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8	TRANS./CONTROLLER/SWITCH		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
BODY/CAGE	10	BODY CAGE MAT'L: CS/316SS/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	11	UPPER CONNECTION: SIDE/TOP		<input type="checkbox"/>	NONE	<input type="checkbox"/>	NONE	<input type="checkbox"/>	NONE	<input type="checkbox"/>	
	12	LOWER CONNECTION: SIDE/BOTTOM		<input type="checkbox"/>	NONE	<input type="checkbox"/>	NONE	<input type="checkbox"/>	NONE	<input type="checkbox"/>	
	13	CONN. SIZE: 1/2"/OTHER		<input type="checkbox"/>	3"	<input type="checkbox"/>	3"	<input type="checkbox"/>	3"	<input type="checkbox"/>	
	14A	CONN. RATING: 150#RF/300#RF 600#RF/other		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
CASE/HEAD	15	CASE MOUNTING: RIGHT/LEFT		<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	
	16	MOUNTING POSITION			-		-		-		
	17	ROTATABLE HEAD: YES/NO		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	18	TORQUE TUBE EXT.: STD./FINNED		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
DISPLACER OR FLOAT	20	DISP./FLOAT: DIMENSIONS		32" Long		72" Long		72" Long			
	21	MAT'L: 316 SS/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	22	TORQUE TUBE MAT'L: K-MONEL/OTHER		<input type="checkbox"/>	Mfg STD	<input type="checkbox"/>	mfg STD	<input type="checkbox"/>	mfg STD	<input type="checkbox"/>	
	23	HANGER EXTENSION: LENGTH.			6"		3"		3"		
XMTR	24	HANGER EXT. MAT'L: 316 SS/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	25	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
CONTROLLER	26	ELECT. CONNECTION			FNPT		FNPT		FNPT		
	27	CONTROL: P/I/D/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	28	INC. VAR. - OUTPUT: INC./DEC.		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	29	AUTO/MAN. SWITCH: YES/NO		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	30	S.P. ADJ.: MAN./REMOTE/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	31	AIR/ELECT. CONNECTION		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
SWITCH	32	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	33	TYPE: ELECTRIC/PNEUMATIC		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	34	CONTACTS: DPDT/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
OPTIONS	35	CONT. RATING: 10A 120V60HZ/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	36	FILT. REG./SUP. GAGE/OUT GAGE (3)		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
SERVICE	37	OUTPUT METER: INTEGRAL/REMOTE		<input type="checkbox"/>	3 1/2" DIA.	<input type="checkbox"/>	3 1/2" DIA.	<input type="checkbox"/>	3 1/2" DIA.	<input type="checkbox"/>	
	38										
	39	TYPE: LEVEL/INTERFACE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	40	UPPER FLUID			AIR		AIR		AIR		
	41	LOWER FLUID			WATER		EFFLUENT		H <sub>2</sub> O EFFLUENT		
42	S.G. @ T NORM: UPPER LOWER			1.0 1.0		1.0 1.0		1.0 1.0			
43	TEMPERATURE: UPPER LOWER °F			60 100		60 100		60 100			
44	PRESSURE: P NORM P MAX. PSIG			0 0		0 0		0 0			
45	VISC. @ T NORM: UPPER LOWER										

NOTES: (1) FLANGES AND GASKETS ON INTERNAL CONNECTIONS I.E. CHAMBER TO HEAD, MUST CONFORM TO SPECIFICATIONS GIVEN ON LINES 14 OR 14A.  
 (2) VENT CONN. REQUIRED WHEN LINE 11 IS "SIDE", DRAIN CONN. REQUIRED WHEN LINE 12 IS "SIDE".  
 (3) ALL PNEUMATIC ITEMS PIPED AND MOUNTED.

BY: WVA P. O. NO. VENDOR

FORM NO. 135-615 A



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-B		5 Dec 80	
MATERIAL	GAGE GLASSES AND GAGE COCKS			C1		C4	
				C2		C5	
DOCUMENTATION REQUIREMENTS				C3		C6	

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

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- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

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TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1613-B  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 133

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

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FORM NO. 135-699A

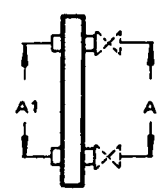
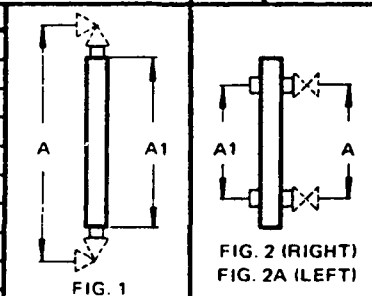


# REQUISITION

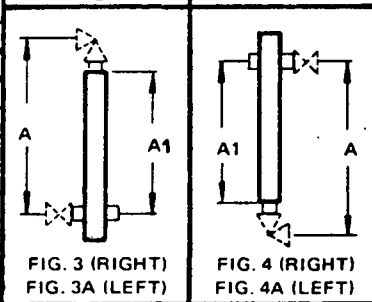
## FOSTER WHEELER ENERGY CORPORATION

CLIENT <u>CONOCO/DOE</u>	CONTRACT <u>15-1910</u>	REQUISITION	DATE
SITE <u>Noble County, Ohio</u>	ITEM NO.	<u>27-1910-1613-B</u>	<u>5 Dec 80</u>
MATERIAL <u>GAGE GLASSES</u>	NO REQ'D	C1	C4
<u>AND</u>		C2	C5
<u>GAGE COCKS</u>	NO REQ'D	C3	C6

GAGE GLASSES	
1	Manufacturer
2	
3	Type: Reflex (R) Transparent (T) Weld Pad (W)
4	Tubular (TU)
5	Chamber Mat'l: Carbon Steel(C) 316S.S(S)
6	Chamber Rating:
7	Options: MICA Shield (1) Internal Tube (4)
8	Guard Rods(2) Illuminators (5)
9	Lucite Frost Shield(3) (6)
10	1/2" NPS end connections (7)
11	(8)



GAGE COCKS	
13	Manufacturer:
14	Type: <input type="checkbox"/> Offset <input type="checkbox"/> Straight
15	Model or Series No. Daniel Type 1 or equal
16	Connections: Tank: 3/4" NPS Vent: 1/2" NPS Gage: 1/2" NPS
17	Closing: Plain (Std.) <input type="checkbox"/> Quick Closing <input type="checkbox"/>
18	Material: Same as Chamber Mat'l
19	Bonnet: Integral <input type="checkbox"/> Union <input type="checkbox"/> Bolted w/OS&Y <input type="checkbox"/>
20	Options: <input type="checkbox"/> Ball Checks <input type="checkbox"/> Renewable Seats



SPECIALS

FIG. 5

TAG NO.	SERVICE	FIG. NO.	A or X	SIZE	TYPE	MAT'L	DESIGN		OPTIONS	NOTES
							Temp	Press		
LG-2702	D-2702	1	LATER	3x9	R	C	100°F	16 psig	7	Notes A thru E Apply to all Tag No.
LG-2703	D-2701	1	LATER	3x9	R	C	100°F	16 psig	7	
LG-2713	D-2703	1	LATER	3x9	R	316L	100°F	16 psig	7	

NOTES

A. All gages shall not exceed 60 inches for a single assembly.

B. Tubular Glass Type gages shall not exceed 18" for a single assembly.

C. All transparent type gages shall be equipped with illuminators.

D. Illuminator supply voltage to be 120 VAC suitable for CL I/Div. II/GR. B, C&D

BY WwA P.O. \_\_\_\_\_ VENDOR \_\_\_\_\_

FORM NO. 135-606



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-C		3 FEB 81	
MATERIAL	DIFFERENTIAL INSTRUMENTS			C1	6 MAR 81	C4	
	LEVEL TRANSMITTERS			C2		C5	
	DOCUMENTATION REQUIREMENTS			C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER	_____	_____	_____
B. WIRING DIAGRAMS	_____	_____	_____	_____
C. PIPING DIAGRAMS	_____	_____	_____	_____
D. CALCULATION OR CALIBRATION	_____	_____	_____	_____
E. DATA BOOK MATERIAL <sup>3</sup>	_____	_____	_____	_____

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

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TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1613-C  
 FWEC P.O. NO. \_\_\_\_\_  
 FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 138

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
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FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE	
SITE	Noble County, Ohio	ITEM NO.	27-1910-1613-C	3 FEB 81	
MATERIAL	DIFFERENTIAL INSTRUMENTS		C1 6 MAR 81	C4	
	LEVEL TRANSMITTERS		C2	C5	
SERVICE			C3	C6	
GENERAL	1 TAG NO./QTY.	LT-2706   1	LT-2708   1	LT-2716   1	LT-2766   1
	2 SERVICE	ACID LEVEL	CAUSTIC LEVEL	PHOSPHORIC ACID	WATER
	3 LINE NO. OR EQUIPMENT NO.	D-2702	D-2701	D-2703	TK-2720
	4 FUNCTION: X-MT./CONT./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5 MANUFACTURER	ROSEMOUNT	ROSEMOUNT	ROSEMOUNT	ROSEMOUNT
	6 SERIES OR MODEL NO.	1151 DP	1151 DP	1151 DP	1151 DP
	7 MOUNTING: 2" YOKE/FLUSH/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8 ELECT CLASS: CLASS/DIV/GR.				
	9 SUPPLY: 24VDC/20 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOCAL	10 CHART/DIAL: 12" CIRC/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11 CHART DRIVE/SPEED				
	12 CHART/DIAL RANGE				
	13 CHART/DIAL SPAN				
XMTR	14 OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15 W/ELECT. CONNECTION	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT
CONTROLLED	16 CONTROL: P/I/D/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	17 INC. VAR. - OUTPUT: INC./DEC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	18 AUTO/MAN. SWITCH: YES/NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	19 S.P. ADJ.: MAN./REMOTE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	20 AIR/ELECT. CONNECTION				
	21 OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ELEMENT	23 VARIABLE: FLOW/DIFF. PRESS./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	24 TYPE: FORCE BAL./MOTION BAL./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	25 BODY MAT'L: C.S./ 316 S.S./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	26 ELEMENT MAT'L: 316 S.S./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	27 RATING: 1500 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	28 DIFF. RANGE	0-50" W.C.	0-30" W.C.	0-50" W.C.	0-300" W.C.
	29 SPAN	50" W.C.	30" W.C.	50" W.C.	300" W.C.
	30 OVERRANGE PROTECTION TO:				
	31 PROCESS DATA: T NORM./T MAX. °F	60   100	60   100	60   100	100
	32 PROCESS DATA: P NORM./P MAX. PSIA	15	15	15	15
	33 PROCESS DATA: SG/SGs	1.8	1.2	1.7	1.0
	34 PROCESS CONNECTIONS	1/4" F NPT	1/4" F NPT	1/4" F NPT	1/4" F NPT
	35 ELEVATION:				
	36 SUPPRESSION	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CAPILLARY SEALS	39 FLANGES: 300# 3" RF/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	40 CAPILLARY LENGTH: FT				
	41 FILL LIQUID:				
OPTIONS	42 FILT. REG./SUP. GAGE/OUT. GAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	43 OUTPUT METER: INTEGRAL/REMOTE	<input type="checkbox"/> 3 1/2"	<input type="checkbox"/> 3 1/2"	<input type="checkbox"/> 3 1/2"	<input type="checkbox"/> 3 1/2"
	44 INTRINSIC SAFETY REQ'D	YES	YES	YES	YES
	45 INTEGRAL J-BOX REQ'D	YES	YES	YES	YES
NOTES: FOR GENERAL NOTES SEE REQ 1910-1600A ALL PNEUMATIC ITEMS PIPED & MOUNTED IF LINE 23 IS "LEVEL", SEE RIGHT → IF LINE 23 IS OTHER THAN LEVEL, SG ONLY IS USED.		SUPPRESSION = L.P. HEAD-H.P. HEAD = HxSGs SPAN = Hi.L.L. HEAD-Lo.L.L. HEAD = LxSG SG IS AT T NORM. SGs IS AT AMBIENT TEMP.			
BY WWA	P. O. NO.	VENDOR			

FORM NO. 135-810A





# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 4

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-D		3 FEB 81	
MATERIAL	LEVEL INSTRUMENTS	LEVEL SWITCHES		C1	6 mae 81	C4	
	(DISPLACER OR FLOAT)			C2		C5	
	DOCUMENTATION REQUIREMENTS			C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	As shown on following pages
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1613-D
FWEC P.O. NO.	
FOR:	CONOCO/DOE Pipeline Gas Demonstration Plant Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 138

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 4

CLIENT		Conoco/DOE		CONTRACT NO. 15-1910				REQUISITION NO.		DATE		
SITE		Noble County, Ohio		ITEM NO.				27-1910-1613D		9 FEB 81		
MATERIAL		LEVEL INSTRUMENTS - Level Switches				C1		6 MAR 81		C4		
		(DISPLACER OR FLOAT)				C2				C5		
						C3				C6		
GENERAL	1	TAG NO.	QUANTITY	LSH/HL-2701	1	LSH-2705		LSH-2707	1	LSH/HL-2712	1	
	2	VESSEL OR LINE NO.		A-2712		D-2702		D-2701		P-2720A/B		
	3	MANUFACTURER OR EQUAL		MAGNETROL		MAGNETROL		MAGNETROL		MAGNETROL		
	4	SERIES OR MODEL NO.		A-103-F		291-C		291-C		A-103-F		
	5	ELECT. CLASS CL./DIV./GR.		- - -		- - -		- - -		- - -		
	6	SUPPLY: 24 VDC/20 PSIG/120 VAC		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
TYPE	7	EXT./INT./DISPL./FLOAT		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	8	TRANS./CONTROLLER/SWITCH		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	9											
BODY/CAGE	10	BODY CAGE MAT'L: CS/316SS/OTHER		<input type="checkbox"/>	CI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CI	
	11	UPPER CONNECTION: SIDE/TOP		<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	12	LOWER CONNECTION: SIDE/BOTTOM		<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	13	CONN. SIZE: 1/2"/2"/OTHER		<input type="checkbox"/>	4"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4"
	14	CONN. RATING: 150#RF/300#RF		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14A	600#RF/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
CASE/HEAD	15	CASE MOUNTING: RIGHT/LEFT		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	16	MOUNTING POSITION		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	17	ROTATABLE HEAD: YES/NO		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	18	TORQUE TUBE EXT.: STD./FINNED		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	19	VENT&DRAIN CONN.: 3/4" NPT/OTHER (2)		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DISPLACER OR FLOAT	20	DISP./FLOAT: DIMENSIONS		mfg STD		mfg STD		mfg STD		mfg STD		
	21	MAT'L: 316 SS/OTHER		<input type="checkbox"/>	Porcelain	<input type="checkbox"/>	Alloy 20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Porcelain	
	22	TORQUE TUBE MAT'L: K-MONEL/OTHER		<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	
	23	HANGER EXTENSION: LENGTH			15'		-		-		10'	
24	HANGER EXT. MAT'L: 316SS/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	Alloy 20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
XMTB	25	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	26	AIR/ELECT. CONNECTION		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CONTROLLER	27	CONTROL: P/I/D/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	29	INC. VAR. = OUTPUT: INC./DEC.		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	29	AUTO/MAN. SWITCH: YES/NO		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	30	S.P. ADJ.: MAN./REMOTE/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	31	AIR/ELECT. CONNECTION		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SWITCH	32	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	33	TYPE: ELECTRIC/PNEUMATIC		<input checked="" type="checkbox"/>	ARRANGE #1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ARRANGE #1	
	34	CONTACTS: DPDT/ DRY/HG/OTHER		<input checked="" type="checkbox"/>	2Sw.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2Sw.	
OPTIONS	36	CONT. RATING: 10A 120V60HZ/OTHER		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	36	DIFFERENTIAL: FIXED/ADJ.		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	37	OUTPUT METER: INTEGRAL/REMOTE		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
38	FILT. REG/SUP. GAGE/OUT. GAGE (3)		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SERVICE	39	TYPE: LEVEL/INTERFACE		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	40	UPPER FLUID			AIR		AIR		AIR		AIR	
	41	LOWER FLUID			WATER		SULPHURIC ACID		NAOH		H <sub>2</sub> O, OILY FROTH	
	42	S.G. @ T NORM: UPPER	LOWER		1	1	1.0	1.8	1.0	1.2	1.0	1.0
	43	TEMPERATURE: UPPER	LOWER OF		70	70	70	70	70	70	70	100
44	PRESSURE: P NORM	P MAX.	PSIG		0		0		0		0	
45	VISC. @ T NORM: UPPER	LOWER CP										
NOTES:												
(1) FLANGES AND GASKETS ON INTERNAL CONNECTIONS I.E. CHAMBER TO HEAD, MUST CONFORM TO SPECIFICATIONS GIVEN ON LINES 14 OR 14A.												
(2) VENT CONN. REQUIRED WHEN LINE 11 IS "SIDE", DRAIN CONN. REQUIRED WHEN LINE 12 IS "SIDE".												
(3) ALL PNEUMATIC ITEMS PIPED AND MOUNTED.												
BY		P. O. NO.				VENDOR						

FORM NO. 135-615 A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 4

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE				
SITE	Noble County, Ohio		ITEM NO.		27-1910-1613D		3 FEB 81				
MATERIAL	LEVEL INSTRUMENTS - Level Switches				C1	6 MAR 81	C4				
	(DISPLACER OR FLOAT)				C2		C5				
					C3		C6				
GENERAL	1	TAG NO.	QUANTITY	LSH-2717	1	KSH/M-2782	1	KSH/M-2751	1	KSH/M-2753	1
	2	VESSEL OR LINE NO.		D-2703		P-2726 A/B		R-2708		P-2731 A/B	
	3	MANUFACTURER		MAGNETROL		MAGNETROL		MAGNETROL		MAGNETROL	
	4	SERIES OR MODEL NO.		291-C		A-103-F		A-103-F		A-103-F	
	5	ELECT. CLASS CL./DIV./GR.		- - -		- - -		- - -		- - -	
	6	SUPPLY: 24 VDC/20 PSIG/ 120 VAC		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TYPE	7	EXT./INT./DISPL./FLOAT		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	8	TRANS./CONTROLLER/SWITCH		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9										
BODY/CAGE	10	BODY CAGE MAT'L: CS/ 316SS/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	CI		<input type="checkbox"/>	<input type="checkbox"/>	CI	
	11	UPPER CONNECTION: SIDE/TOP		<input type="checkbox"/>	<input type="checkbox"/>	-		<input type="checkbox"/>	<input type="checkbox"/>	-	
	12	LOWER CONNECTION: SIDE/BOTTOM		<input type="checkbox"/>	<input type="checkbox"/>	-		<input type="checkbox"/>	<input type="checkbox"/>	-	
	13	CONN. SIZE: 1/2"/3"/OTHER		<input type="checkbox"/>	1 1/2" welded	<input type="checkbox"/>	4"	<input type="checkbox"/>	4"	<input type="checkbox"/>	4"
	14	CONN. RATING: 150#RF/300#RF		<input type="checkbox"/>	<input type="checkbox"/>	125#	<input type="checkbox"/>	125#	<input type="checkbox"/>	125#	<input type="checkbox"/>
14A	600#RF/OTHER		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		
CASE/HEAD	15	CASE MOUNTING: RIGHT/LEFT		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	16	MOUNTING POSITION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	17	ROTATABLE HEAD: YES/NO		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	18	TORQUE TUBE EXT.: STD./FINNED		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	19	VENT & DRAIN CONN.: 1/2" NPTF/OTHER (2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DISPLACER OR FLOAT	20	DISP./FLOAT: DIMENSIONS		mfg STD		mfg STD		mfg STD		mfg STD	
	21	MAT'L: 316 SS/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	Porcelain		<input type="checkbox"/>	<input type="checkbox"/>	Porcelain	
	22	TORQUE TUBE MAT'L: K-MONEL/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	-		<input type="checkbox"/>	<input type="checkbox"/>	-	
	23	HANGER EXTENSION: LENGTH		<input type="checkbox"/>	<input type="checkbox"/>	-		<input type="checkbox"/>	<input type="checkbox"/>	-	
24	HANGER EXT. MAT'L: 316SS/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
XMTB	25	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	26	AIR/ELECT. CONNECTION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CONTROLLER	27	CONTROL: P/I/D/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	28	INC. VAR. - OUTPUT: INC./DEC.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	29	AUTO/MAN. SWITCH: YES/NO		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	30	S.P. ADJ.: MAN./REMOTE/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	31	AIR/ELECT. CONNECTION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
32	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
SWITCH	33	TYPE: ELECTRIC/PNEUMATIC		<input type="checkbox"/>	<input type="checkbox"/>	ARRANGE #1		<input type="checkbox"/>	<input type="checkbox"/>	ARRANGE #1	
	34	CONTACTS: DPDT/ DRY/HG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	2 SW		<input type="checkbox"/>	<input type="checkbox"/>	2 SW	
	35	CONT. RATING: 10A 120V60HZ/OTHER		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>		
36	DIFFERENTIAL: FIXED/ADJ.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
OPTIONS	37	OUTPUT METER: INTEGRAL/REMOTE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	38	FILT. REG./SUP. GAGE/OUT. GAGE (3)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SERVICE	39	TYPE: LEVEL/INTERFACE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	40	UPPER FLUID		AIR		AIR		AIR		AIR	
	41	LOWER FLUID		Phosphoric Acid		WATER		WATER		WATER	
	42	S.G. @ T NORM: UPPER LOWER		1.0 1.7		1.0 1.0		1.0 1.0		1.0 1.0	
	43	TEMPERATURE: UPPER LOWER OF		70 70		60 100		70 70		70 70	
	44	PRESSURE: P. NORM P. MAX. PSIG		0 0		0 0		0 0		0 0	
45	VISC. @ T NORM: UPPER LOWER CP										
NOTES:		(1) FLANGES AND GASKETS ON INTERNAL CONNECTIONS I.E. CHAMBER TO HEAD, MUST CONFORM TO SPECIFICATIONS GIVEN ON LINES 14 OR 14A. (2) VENT CONN. REQUIRED WHEN LINE 11 IS "SIDE", DRAIN CONN. REQUIRED WHEN LINE 12 IS "SIDE". (3) ALL PNEUMATIC ITEMS PIPED AND MOUNTED.									
BY:	WWA		P. O. NO.		VENDOR						

FORM NO. 135-615 A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 4 OF 4

CLIENT		Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE		Noble County, Ohio		ITEM NO.		27-1910-1613D		3 Feb 81	
MATERIAL		LEVEL INSTRUMENTS - Level Switches				C1		C4	
		(DISPLACER OR FLOAT)				C2		C5	
						C3		C6	
GENERAL	1	TAG NO.	QUANTITY	150/HL-2782 1	100/LSL-2783 1				
	2	VESSEL OR LINE NO.		P-2722 A/B	P-2705 A/B				
	3	MANUFACTURER		MAENETROL	MAGNETROL				
	4	SERIES OR MODEL NO.		A-103-F	A-103-F				
	5	ELECT. CLASS CL./DIV./GR.		- - -	- - -				
	6	SUPPLY: 24 VDC/20 PSIG/ 120 VAC			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TYPE	7	EXT./INT./DISPL./FLOAT		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8	TRANS./CONTROLLER/SWITCH		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9								
BODY/CAGE	10	BODY CAGE MAT'L: CS/316SS/OTHER		<input type="checkbox"/> CI	<input type="checkbox"/> CI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11	UPPER CONNECTION: SIDE/TOP		<input type="checkbox"/> -	<input type="checkbox"/> -	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12	LOWER CONNECTION: SIDE/BOTTOM		<input type="checkbox"/> -	<input type="checkbox"/> -	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13	CONN. SIZE: 1/2"/2"/OTHER		<input type="checkbox"/> 4"	<input type="checkbox"/> 4"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14	CONN. RATING: 150#RF/300#RF		<input type="checkbox"/> 125°	<input type="checkbox"/> 125°	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14A	600#RF/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
CASE/HEAD	15	CASE MOUNTING: RIGHT/LEFT		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	16	MOUNTING POSITION		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	17	ROTATABLE HEAD: YES/NO		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	18	TORQUE TUBE EXT.: STD./FINNED		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	VENT&DRAIN CONN.: 3/4" NPT/OTHER (2)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
DISPLACER OR FLOAT	20	DISP./FLOAT: DIMENSIONS		Mfg STD	Mfg STD				
	21	MAT'L: 316 SS/OTHER		<input type="checkbox"/> PORCELAIN	<input type="checkbox"/> PORCELAIN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	22	TORQUE TUBE MAT'L: K-MONEL/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	23	HANGER EXTENSION: LENGTH		10'	10'				
24	HANGER EXT. MAT'L: 316SS/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XMT	25	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	26	AIR/ELECT. CONNECTION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONTROLLER	27	CONTROL: P/I/D/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	28	INC. VAR. - OUTPUT: INC./DEC.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	29	AUTO/MAN. SWITCH: YES/NO		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	30	S.P. ADJ.: MAN./REMOTE/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	31	AIR/ELECT. CONNECTION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SWITCH	33	TYPE: ELECTRIC/PNEUMATIC		<input type="checkbox"/> ARR #1	<input type="checkbox"/> ARR #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	34	CONTACTS: DPDT/ DRY/HG/OTHER		<input type="checkbox"/> 2SW	<input type="checkbox"/> 2SW	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	35	CONT. RATING: 10A 120V60HZ/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	36	DIFFERENTIAL: FIXED/ADJ.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OPTIONS	37	OUTPUT METER: INTEGRAL/REMOTE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	38	FILT. REG/SUP. GAGE/OUT. GAGE (3)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SERVICE	39	TYPE: LEVEL/INTERFACE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	40	UPPER FLUID		AIR	AIR				
	41	LOWER FLUID		SLUDGE	OIL				
	42	S.G. @ T NORM: UPPER LOWER		1.0 1.2	1.0 1.0				
	43	TEMPERATURE: UPPER LOWER OF		70 70	70 70				
	44	PRESSURE: P NORM P MAX. PSIG		0 0	0 0				
45	VISC. @ T NORM: UPPER LOWER CP								
NOTES:		(1) FLANGES AND GASKETS ON INTERNAL CONNECTIONS I.E. CHAMBER TO HEAD, MUST CONFORM TO SPECIFICATIONS GIVEN ON LINES 14 OR 14A. (2) VENT CONN. REQUIRED WHEN LINE 11 IS "SIDE", DRAIN CONN. REQUIRED WHEN LINE 12 IS "SIDE". (3) ALL PNEUMATIC ITEMS PIPED AND MOUNTED.							
BY		WVA		P. O. NO.		VENDOR			

FORM NO. 135-615 A



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 3

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-E	FEB 81
MATERIAL LEVEL INSTRUMENTS				C1	6 MAR 81
SONIC-TRANSMITTERS & SWITCHES				C2	C5
DOCUMENTATION REQUIREMENTS				C3	C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER	_____	_____	_____
B. WIRING DIAGRAMS	_____	_____	_____	_____
C. PIPING DIAGRAMS	_____	_____	_____	_____
D. CALCULATION OR CALIBRATION	_____	_____	_____	_____
E. DATA BOOK MATERIAL <sup>3</sup>	_____	_____	_____	_____

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE:

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1613-E  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 13B

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 2

CLIENT		CONOCO/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE		
SITE		Noble County, Ohio		27-1910-1613-E		4 FEB-81				
MATERIAL		LEVEL INSTRUMENTS		C1		6 MAR 81		C4		
		SONIC-TRANSMITTERS & SWITCHES		C2				C5		
				C3				C6		
GENERAL	1	TAG NUMBER	LSL-2711		1					
	2	SERVICE	CARBON POWDER							
	3	LINE NO./VESSEL NO.	TK-2707							
	4	MANUFACTURER	PREFVAL		ENDRESS+HAUSER					
	5	MODEL OR SERIES NO.	FTM-1630							
	6	FUNCTION	SWITCH							
	7	FAIL-SAFE: HIGH/LOW/NONE	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
PROBE 1	8	ORIENTATION	HORIZ							
	9	STYLE	MODEL 1							
	10	MATERIAL	316 SS							
	11	SHEATH / COATING	-							
	12	INSERTION LENGTH	8"							
	13	INACTIVE LENGTH	-							
	14	GLAND SIZE & MAT'L	-							
	15	CONDUIT CONNECTION	-							
	16	2 TERMINAL / 3 TERMINAL	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
17	PROCESS CONN.	1 1/2" MNPT								
AMPLIFIER	18	LOCATION: REMOTE/LOCAL	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	19	ENCLOSURE	NEMA 4							
	20	CONDUIT CONNECTION	3/4" (F) NPT							
	21	POWER SUPPLY	115VAC 60HZ							
SWITCH	22	TYPE	DPDT							
	23	QUANTITY AND FORM	1							
	24	RATING: VOLTS-HZ/DC	110V   60							
	25	AMPS/WATTS/HP	5   -   -							
	26	LOAD TYPE	-							
	27	LEVEL INC. CONTACTS: OPEN/CLOSE	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
TRANS 1	28	OUTPUT: 4-20mA/3-15PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	29	TYPE: 2 WIRE/4 WIRE/ISOLATED	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	30	RANGE								
OPTIONS	31	ENCLOSURE CLASS								
	32	COMPENSATION CABLE								
	33	LOCAL INDICATOR								
	34	I/P TRANSDUCER								
SERVICE	35	SIGNAL LIGHTS								
	36									
	37	UPPER FLUID	AIR							
	38	LOWER FLUID	POWDERED CARBON							
	39	SP. GRAY. : UPPER	1.0		.71					
	40	VISCOSITY: UPPER								
	41	CONDUCTIVITY: UPPER								
	42	PRESSURE: MAX	NORM		0 PSIG					
43	TEMPERATURE: MAX	NORM		60°F						
44	MOISTURE (% WT)	BULK DENS.								
45	VIBRATION	MATERIAL BUILDUP								

FORM NO. 135-608A

NOTES:

1. IMMUNE TO MATERIAL BUILD-UP (CONDUCTIVE OR OTHERWISE), RF INTERFERENCE, AND VARIATIONS IN MATERIAL COMPOSITION & TEMPERATURE CHANGES.

BY WVA P. O. NO. SUPPLIER



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 3

CLIENT		CONOCO/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE		
SITE		Noble County, Ohio		27-1910-1613-E		19 MAR 81				
MATERIAL		LEVEL INSTRUMENTS		C1	19 MAR 81	C4				
		ULTRA SONIC-TRANSMITTERS & SWITCHES		C2		C5				
				C3		C6				
GENERAL	1	TAG NUMBER		LT-2784-1						
	2	SERVICE		TANK LEVEL						
	3	LINE NO./VESSEL NO.		TK-2717						
	4	MANUFACTURER OR EVAL		INDICATOR						
	5	MODEL OR SERIES NO.		"BIG NOISE"						
	6	FUNCTION		TRANSMIT						
	7	FAIL-SAFE: HIGH/LOW/NONE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PROBE 1	8	ORIENTATION		VERTICAL - DOWNWARD						
	9	STYLE		-						
	10	MATERIAL		-						
	11	ENCLOSURE		NEMA 9						
	12	RANGE MIN/MAX		1 FT / 13 FT						
	13	MOUNTING		TANK TOP						
TANK	14	INDOOR / OUTDOOR		<input type="checkbox"/>						
	15	TANK ROOF		NONE-OPEN						
	16	TANK I.D.		17'0"		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	17	TANK MAT'L		STEEL						
AMPLIFIER	18	LOCATION: REMOTE/LOCAL		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	19	ENCLOSURE		NEMA 9						
	20	CONDUIT CONNECTION		1/2 (F) NPT						
	21	POWER SUPPLY		117 VAC 60HZ						
SWITCH	22	TYPE		X						
	23	QUANTITY AND FORM								
	24	RATING: VOLTS-HZ/DC								
	25	AMPS/WATTS/HP								
	26	LOAD TYPE								
	27	LEVEL INC. CONTACTS: OPEN/CLOSE				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	TRANS. 1	28	OUTPUT: 4-20mA/3-15PSIG/OTHER			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29		TYPE: 2 WIRE/4 WIRE/ISOLATED		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
30		RANGE		12 FT						
OPTIONS	31	ENCLOSURE CLASS		NEMA 9						
	32	COMPENSATION CABLE		75 FT						
	33	LOCAL INDICATOR		3/4 DIA						
	34	I/P TRANSDUCER		-						
	35	SIGNAL LIGHTS		-						
SERVICE	37	UPPER FLUID		AIR						
	38	LOWER FLUID		H <sub>2</sub> O + SLUDGE						
	39	DIELEC.CONST.: UPPER		LOWER						
	40	VISCOSITY: UPPER		LOWER						
	41	CONDUCTIVITY: UPPER		LOWER						
	42	PRESSURE: MAX		NORM		ATM OS	ATM OS			
	43	TEMPERATURE: °F MAX		NORM		150	50-100			
	44	MOISTURE (% WT)		BULK DENS.						
	45	VIBRATION		MATERIAL BUILDUP						

FORM NO. 135-608A

NOTES:

1. IMMUNE TO MATERIAL BUILD-UP (CONDUCTIVE OR OTHERWISE), RF INTERFERENCE, AND VARIATIONS IN MATERIAL COMPOSITION & TEMPERATURE CHANGES.

BY WNA P. O. NO. SUPPLIER



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 3

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.		27-1910-1613-H	4 FEB 81
MATERIAL	LEVEL INSTRUMENTS - TRANSMITTERS			C1 6 MAR 81	C4
	FLOAT - ACTUATED			C2	C5
	DOCUMENTATION REQUIREMENTS			C3	C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER →	_____	_____	_____
B. WIRING DIAGRAMS	_____	_____	_____	_____
C. PIPING DIAGRAMS	_____	_____	_____	_____
D. CALCULATION OR CALIBRATION	_____	_____	_____	_____
E. DATA BOOK MATERIAL <sup>3</sup>	_____	_____	_____	_____

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8½ x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1613-H  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 138

1. IN 8½ x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8½ x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-689A





# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 3

CLIENT <b>CONOCO/DOE</b>		CONTRACT NO. <b>15-1910</b>		REQUISITION NO.		DATE					
SITE <b>NOBLE COUNTY, OHIO</b>		ITEM NO.		<b>27-1910-1613-H</b>		<b>4 FEB 81</b>					
MATERIAL <b>LEVEL INSTRUMENTS - LEVEL TRANSMITTERS</b>				C1	<b>6-MAR 81</b>	C4					
<del>DISPLACER OR</del> <b>FLOAT - ACTUATED</b>				C2		C5					
				C3		C6					
GENERAL	1	TAG NO.	QUANTITY	<b>LG-2767</b>	<b>1</b>	<b>LT/LI-2768</b>	<b>1</b>	<b>LT/LI-2785</b>	<b>1</b>	<b>LT/LI-2786</b>	<b>1</b>
	2	VESSEL OR LINE NO.		<b>TK-2720</b>		<b>TK-2722</b>		<b>TK-2701</b>		<b>TK-2702</b>	
	3	MANUFACTURER	<b>OR EQUAL</b>	<b>SHAND JURS</b>		<b>SHAND JURS</b>					
	4	SERIES OR MODEL NO.		<b>92302</b>		<b>92020</b>					
	5	ELECTRICAL CLASSIFICATION						<b>11012</b>		<b>11012</b>	
	6	SUPPLY: 24 V DC/20 PSIG/OTHER			<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>
TYPE	7	EXT./INT./DISPL./FLOAT		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	8	TRANS./CONTROLLER/SWITCH		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9										
GAUGE HEAD	10	GAUGE RANGE (TANK HEIGHT)		<b>30'</b>		<b>30'</b>		<b>12'</b>		<b>12'</b>	
	11	BODY MAT'L (HOUSING)				<b>CAS ALUM</b>					
	12	LOCAL READOUT		<b>FT. &amp; IN.</b>		<b>FT &amp; IN'</b>					
	13	TAPE MAT'L		<b>ALUM</b>		<b>S.S</b>					
	14	SEALED X'MTR/COUNTER FROM HEAD				<b>NO</b>					
	14A	DRAIN				<b>YES</b>					
ACCESSORIES	15	GUIDE WIRES		<b>S.S.</b>		<b>S.S</b>					
	16	GUIDE WIRE SPRING AND ANCHOR		<b>S.S</b>		<b>S.S</b>					
	17	90° PULLEYS (GROUND READING)		<b>YES</b>		<b>YES</b>					
	18	ROOF TANK: FIXED/CONICAL/FLOATING		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	19	INSTALLATION KIT		<b>CLASS 2 A</b>		<b>NO. 1 B</b>					
FLOAT	20	<del>DISPLACER</del> FLOAT: DIMENSIONS		<b>Mfy STD</b>		<b>Mfy STD</b>					
	21	MAT'L: <b>316 SS</b> /OTHER		<input type="checkbox"/>	<b>POLYETHYLENE</b>	<input type="checkbox"/>	<b>POLYETHYLENE</b>	<input type="checkbox"/>	<b>POLYETHYLENE</b>	<input type="checkbox"/>	
	22	SPECIFIC GRAVITY RANGE:									
	23										
XMTR	25	OUTPUT: 4-20mA/3-15 PSIG/OTHER		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	26	<del>DISPLACER</del> ELECT. CONNECTION				<b>1/4" NPT</b>					
	27	ENCLOSURE				<b>NEMA 9</b>					
	28	INPUT SIGNAL				<b>POTENTIOMETRIC</b>					
	29										
	30										
SWITCH	33	TYPE: ELECTRIC/PNEUMATIC		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	34	CONTACTS: DPDT/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	35	CONT. RATING: 10A 120V60HZ/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
OPTIONS	36	FILT. REG./SUP. GAGE/OUT GAGE (3)		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	37	OUTPUT METER: INTEGRAL/REMOTE		<input type="checkbox"/>		<input type="checkbox"/> (LINE 12)		<input type="checkbox"/> (LINE 12)		<input type="checkbox"/> (LINE 12)	
	38	HAND CRANK OPERATIONAL CHECKER		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
SERVICE	39	TYPE: LEVEL/INTERFACE		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	40	FLUID		<b>H<sub>2</sub>O</b>		<b>H<sub>2</sub>O</b>		<b>OIL-WATER</b>		<b>OIL-WATER</b>	
	42	S.G. @ T NORM		<b>1.0</b>		<b>1.0</b>		<b>.9-.93</b>		<b>.9-.93</b>	
	43	TEMPERATURE		<b>100°F</b>		<b>100°F</b>		<b>180°F</b>		<b>180°F</b>	
	44	PRESSURE: P NORM   P MAX. Psig		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	
45	VISC. @ T NORM										
NOTES:		1. CLOSED TANK PRESS. IS NITROGEN GAS BLANKET PRESSURE AS SHOWN IN LINE 44.									
BY: <b>WVA</b>		P. O. NO.				VENDOR					

FORM NO. 135-615 A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 3

CLIENT <b>CONOCO / DOE</b>	CONTRACT NO. <b>15-1910</b>	REQUISITION NO.	DATE
SITE <b>NOBLE COUNTY, OHIO</b>	ITEM NO.	<b>27-1910-1613-H</b>	<b>9 FEB 81</b>
MATERIAL	<b>LEVEL INSTRUMENTS - LEVEL TRANSMITTERS</b>	C1 <b>6 MAR 81</b>	C4
	<del>DISPLACER OR</del> <b>FLOAT - ACTUATED</b>	C2	C5
		C3	C6

GENERAL	1	TAG NO.	QUANTITY	<b>47/1-2204</b>	<b>1</b>				
	2	VESSEL OR LINE NO.		<b>TK-2717</b>					
	3	MANUFACTURER OR EQUAL		<b>SHAW &amp; JURS</b>					
	4	SERIES OR MODEL NO.		<b>92020</b>					
	5	ELECTRICAL CLASSIFICATION							
	6	SUPPLY: 24 VDC/20 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TYPE	7	EXT./INT./DISPL./FLOAT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	8	TRANS./CONTROLLER/SWITCH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	9								
GAUGE HEAD	10	GAUGE RANGE (TANK HEIGHT)							
	11	BODY MAT'L (HOUSING)	<b>CAST</b>		<b>1m</b>				
	12	LOCAL READOUT	<b>FT</b>		<b>N</b>				
	13	TAPE MAT'L	<b>SS</b>						
	14	SEALED X'MTR/COUNTER FROM HEAD	<b>A</b>						
ACCESSORIES	14A	DRAIN							
	15	GUIDE WIRES							
	16	GUIDE WIRE SPRING AND ANCHOR							
	17	90° PULLEYS (GROUND READING)							
FLOAT	18	ROOF TANK: FIBER/CONICAL/FLOATING	<input type="checkbox"/>	<b>NO</b>	<b>TOP</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	19	INSTALLATION KIT		<b>NO</b>					
	20	FLOAT: DIMENSIONS		<b>M</b>	<b>TD</b>				
XMTR	21	MAT'L: 316 SS/OTHER	<input type="checkbox"/>		<b>EPH/PLA</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	22	SPECIFIC GRAVITY RANGE:							
SWITCH	23								
	24								
	25	OUTPUT: 4-20mA/3-15 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	26	ELECT. CONNECTION	<input type="checkbox"/>	<b>1</b>	<b>IPT</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	27	ENCLOSURE	<input type="checkbox"/>	<b>NET</b>	<b>R</b>				
OPTIONS	28	INPUT SIGNAL	<input type="checkbox"/>	<b>RTN</b>	<b>STRICT</b>				
	29								
	30								
SERVICE	31								
	32								
	33	TYPE: ELECTRIC/PNEUMATIC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SERVICE	34	CONTACTS: DPDT/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	35	CONT. RATING: 10A 120V 60HZ/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SERVICE	36	FILT. REG./SUP. GAGE/OUT GAGE (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	37	OUTPUT METER: INTEGRAL/REMOTE	<input type="checkbox"/>	<b>(LINE 12)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	38	HAND CRANK/OPERATIONAL CHECKER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SERVICE	39	TYPE: LEVEL/INTERFACE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	40			<b>SLUDGE</b>					
	41								
SERVICE	42	S.G. @ T NORM		<b>1.0</b>					
	43	TEMPERATURE	<b>°F</b>	<b>50 TO 100</b>					
	44	PRESSURE: P NORM P MAX.	<b>PSIG</b>	<b>0</b>					
45	VISC. @ T NORM								

DELETED & TRANSFERRED TO 27-1910-1613-C

NOTES:

BY: <b>UWA</b>	P. O. NO.	VENDOR
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FORM NO. 135-615 A



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 4

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1614-13		6 FEB 81	
MATERIAL	PRESSURE GAGES			C1	6 MAR 81	C4	
				C2		C5	
				C3		C6	

### DOCUMENTATION REQUIREMENTS

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE:

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	As shown on following pages
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	15-1910-1614-13
FWEC P.O. NO.	
FOR:	CONOCO/DOE Pipeline Gas Demonstration Plant Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO:
- |  |
|--|
| FOSTER WHEELER ENERGY CORP.<br>110 SOUTH ORANGE AVENUE<br>LIVINGSTON, NJ 07039 |
| ATTENTION: VENDOR PRINT CONTROL, INST. GROUP<br>DEPT. 125                      |

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF 7

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	NOBLE COUNTY, OHIO			27-1910-1614-B		5 FEB 81	
MATERIAL	PRESSURE GAGES			C1	6-MAR-81	C4	
				C2		C5	
SERVICE				C3		C6	

1. MANUFACTURER: OR EQUAL: AMETEK
2. MODEL NO./QUANTITY: SOLFUNT 4.5 / ONE/TAG#
3. TYPE: DIRECT RDG.  3-15 LB. RECEIVER   
OTHER \_\_\_\_\_
4. MOUNTING: SURFACE  LOCAL  FLUSH
5. DIAL: DIAMETER 4 1/2" COLOR MFG. STD.
6. CASE: CAST IRON  ALUMINUM  PHENOLIC   
OTHER \_\_\_\_\_
7. RING: SCREWED  HINGED  SLIP  STD   
OTHER \_\_\_\_\_
8. BLOW-OUT PROTECTION: NONE  BACK   
DISC  SOLID FRONT  OTHER \_\_\_\_\_
9. LENS: GLASS  PLASTIC
10. OPTIONS: SYPHON 1 MATERIAL \_\_\_\_\_  
                  SNUBBER 2 \_\_\_\_\_  
                  PRESSURE LIMIT VALVE 3 \_\_\_\_\_  
                  MOVEMENT DAMPING 4 \_\_\_\_\_

11. NOMINAL ACCURACY REQUIRED 1% OF SPAN
12. PRESS.ELEMENT: BOURDON  BELLOWS   
OTHER \_\_\_\_\_
13. ELEMENT MTL: BRONZE  STEEL   
316 SS OTHER \_\_\_\_\_
14. SOCKET MTL: BRONZE  STEEL   
316 SS OTHER \_\_\_\_\_
15. CONNECTION-NPT: 1/2 IN.  1/2 IN.   
BOTTOM  BACK   
OTHER \_\_\_\_\_
16. MOVEMENT: BRONZE  SS  NYLON   
OTHER \_\_\_\_\_
17. GENERAL NOTES: Where note B or C is specified, fill fluid shall have stability range of -50 to +500°F (Ametek Fluorolube FS5 or equal).

TAG NO.	EPD	LINE OR EQUIPMENT NO.	OPTIONS	P.NORM.	P.MAX.	T.MAX.	SCALE RANGE	NOTES
PG-2702	1	2" CWR270103 LC		52 psig	62 psig	100 °F	0-100	
PG-2703	1	2" CWR270103 LC		52	62	100	0-100	
PG-2704	1	1" C 270108 AS		14	100	100	0-100	C-Alloy 20
PG-2705	1	1" C 270108 AS		14	100	100	0-100	C-Alloy 20
PG-2706	1	1" C 270110 AK2		10	100	100	0-100	
PG-2707	1	1" C 270110 AK2		10	100	100	0-100	
PG-2708	1	9" WW270117 LC		25	30	100	0-60	
PG-2709	1	9" WW270117 LC		25	30	100	0-60	
PG-2710	1	3/4" C 270125 AS		10	100	100	0-100	C-Alloy 20
PG-2721	2	1" WW270212 LC		75	95	100	0-100	
PG-2723	2	1 1/4" WW270206 LC		15	18	100	0-30	
PG-2724	2	1 1/4" WW270206 LC		15	18	100	0-30	
PG-2729	2	3/4" C 270216 RH1		10	100	100	0-100	
PG-2730	2	3/4" C 270216 RH1		10	100	100	0-100	
PG-2731	2	3 DM 270224 LC		20	30	100	0-30	C-316SS
PG-2732	2	3 DM 270224 LC		20	30	100	0-30	C-316SS
PG-2741	3	4 WW270301 LC		45	60	100	0-100	
PG-2742	3	4 WW270301 LC		45	60	100	0-100	
PG-2743	3	2" WW270309 LC		20	24	100	0-30	
PG-2744	3	2" WW270309 LC		20	24	100	0-30	
PG-2745	3	4" WW270311 LC		50	60	100	0-100	
PG-2746	3	4" WW270311 LC		50	60	100	0-100	

NOTES: A - Copper and copper bearing alloys shall not be exposed to the atmosphere of the process fluid.

B - \_\_\_\_\_" RF \_\_\_\_\_# flanged \_\_\_\_\_ STL. spool piece with flanged diaphragm seal req'd. (Ametek type RN and RP or equal).

C - Removable diaphragm seal with 3/4" NPT process conn. req'd (Ametek type RH or equal). GAGE SIDE C.S., PROCESS SIDE & DIAPHRAGM MAT'L AS NOTED + FLUSH CONN.

BY WWA P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF 4

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	NOBLE COUNTY, OHIO			27-1910-1614-B		5 FEB 81	
MATERIAL	PRESSURE GAGES			C1	6 MAR 81	C4	
				C2		C5	
SERVICE				C3		C6	

- MANUFACTURER: OR EQUAL: AMETEK
- MODEL NO./QUANTITY: SOLFUNT 4.5 / ONE/TAG#
- TYPE: DIRECT RDG.  3-15 LB.RECEIVER   
OTHER \_\_\_\_\_
- MOUNTING: SURFACE  LOCAL  FLUSH
- DIAL: DIAMETER 4 1/2" COLOR \_\_\_\_\_ MFG. STD.
- CASE: CAST IRON  ALUMINUM  PHENOLIC   
OTHER \_\_\_\_\_
- RING: SCREWED  HINGED  SLIP  STD   
OTHER \_\_\_\_\_
- BLOW-OUT PROTECTION: NONE  BACK   
DISC  SOLID FRONT  OTHER \_\_\_\_\_
- LENS: GLASS  PLASTIC
- OPTIONS: SYPHON 1 MATERIAL \_\_\_\_\_  
                  SNUBBER 2 \_\_\_\_\_  
                  PRESSURE LIMIT VALVE 3 \_\_\_\_\_  
                  MOVEMENT DAMPING 4 \_\_\_\_\_

- NOMINAL ACCURACY REQUIRED 1% OF SPAN
- PRESS.ELEMENT: BOURDON  BELLOWS   
OTHER \_\_\_\_\_
- ELEMENT MTL: BRONZE  STEEL   
316 SS OTHER \_\_\_\_\_
- SOCKET MTL: BRONZE  STEEL   
316 SS OTHER \_\_\_\_\_
- CONNECTION-NPT: 1/4 IN.  1/2 IN.   
BOTTOM  BACK   
OTHER \_\_\_\_\_
- MOVEMENT: BRONZE  SS  NYLON   
OTHER \_\_\_\_\_
- GENERAL NOTES: Where note B or C is specified, fill fluid shall have stability range of -50 to +500°F (Ametek Fluorolube FS5 or equal).

TAG NO.	EFD	LINE OR EQUIPMENT NO.	OPTIONS	P.NORM.	P.MAX.	T.MAX.	SCALE RANGE	NOTES
PG-2747	3	2"DM270315LC		15	50	100	0-60	C-316SS
PG-2748	3	2"DM270315LC		15	50	100	0-60	C-316SS
PG-2751	3	2"DM270316LC		15	50	100	0-60	C-316SS
PG-2757	3	P-2704A		±40	140	100	0-100	
PG-2758	3	P-2704B		±40	140	100	0-100	
PG-2759	3	P-2704C		±40	140	100	0-100	
PG-2763	4	2DSC270411LC		30	90	100	0-60	
PG-2764	4	2DSC270411LC		30	90	100	0-60	
PG-2765	4	1 1/2"DY270416LC		82	100	100	0-160	
PG-2766	4	1 1/2"DY270416LC		82	100	100	0-160	
PG-2769	5	4"WW270518LC		40	48	100	0-100	
PG-2770	5	4"WW270518LC		40	48	100	0-100	
PG-2771	5	8"WW270508LC		53	69	100	0-100	
PG-2772	5	8"WW270508LC		53	64	100	0-100	
PG-2773	5	2"DM270506MF		40	48	214	0-60	
PG-2774	5	2"DM270506MF		40	48	214	0-60	
PG-2775	5	6"WW270504LC		75	90	100	0-100	
PG-2776	5	6"WW270504LC		75	90	100	0-100	
PG-2787	6	2"DM270608LC		15	50	100	0-30	
PG-2788	6	2"DM270608LC		15	50	100	0-30	
PG-2790	6	3" P270622A		40	50	200	0-100	
PG-2791	6	2"DM270605LC		15	50	100	0-60	C-316SS
PG-2792	6	2"DM270605LC		15	50	100	0-60	C-316SS

NOTES: A - Copper and copper bearing alloys shall not be exposed to the atmosphere or the process fluid.

B - \_\_\_\_\_" RF \_\_\_\_\_# flanged \_\_\_\_\_STL. spool piece with flanged diaphragm seal req'd. (Ametek type RN and RP or equal).

C - Removable diaphragm seal with 3/4" NPT process conn. req'd (Ametek type RH or equal) GAGE SIDE CS, PROCESS SIDE A DIAPHRAGM MAT'L AS NOTED + FLUSH CONN.

BY	<u>WNA</u>	P. O. NO.	VENDOR
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FORM NO. 135-619A





# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE *A* OF

CLIENT	CONOCO/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio		27-1910-1616-K	19 Dec 80
MATERIAL	PH Analyzer		C1 4 max 81	C5
			C2	C6
			C3	C7
			C4	C8

### CHANGE INDEX

PG. NO.	REVISION								PG. NO.	REVISION									
	0	1	2	3	4	5	6	7		8	0	1	2	3	4	5	6	7	8
A	0	1																	
1	0	0																	
2	0	0																	
3	0	0																	
4	0	1																	
5	0	0																	
6	0	1																	
7	0	0																	
8	0	1																	

NOTES:

FORM NO. 135-630

BY *WVA*

P.O. NO.

VENDOR



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 8

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1616 K		19 Dec 80	
MATERIAL	PH Analyzer			C1		C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	As shown on following pages
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1616-K
FWEC P.O. NO.	
FOR:	CONOCO/DOE Pipeline Gas Demonstration Plant Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO:
- FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039
- ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 139

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	27-1910-1616-K	19 Dec 80
MATERIAL	PH Analyser		C1	C4
OR			C2	C5
SERVICE			C3	C6

### INDEX

	<u>Page</u>
1. Scope	3
2. Process Data	4
3. Requirements	5
4. Required Analyser Output	5
5. Analyser Enclosure	5
6. Utilities	6
7. Inspection	7
8. Documentation	7
9. Proposal Requirements	7
10. Ambient Conditions	8

FORM NO. 135-901

BY	<i>WVA</i>	P.O. NO.	SUPPLIER
----	------------	----------	----------



# REQUISITION

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 3 OF

CHANGE NO.

DATE 19 Dec 80

REQUISITION NO. 27-1910-1616-K

## 1.0 SCOPE

- 1.1 This inquiry covers the requirement for a continuously operating analyser system to monitor the process fluid described in Section 2.0 and provide a measurement of PH value. The analyser system is required for the Conoco/DOE Pipeline Gas Demonstration Plant, Noble County, Ohio.
- 1.2 The vendor shall supply one analyser system per Tag number. A listing of the Tag numbers is given in Section 2.0.

FORM NO. 135-902



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 4 OF

CHANGE NO.	DATE <i>19 Dec 80</i>	REQUISITION NO. <i>27-1910-1616-K</i>
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### 2.0 PROCESS DATA (PH Analysers)

Cell Tag No.	<i>AE-2701</i>	<i>AE-2741</i>	
Transm. Tag No.	<i>AT-2701</i>	<i>AT-2741</i>	
Service	<i>EQUALIZATION BASIN</i>	<i>EVAP. COOLING TANK</i>	
Process Fluid	<i>WATER</i>	<i>WATER</i>	
Normal PH	<i>7 to 8 f</i>	<i>7 to 8 f</i>	
Required Inst. Range	<i>6 to 9 f</i>	<i>6 to 9 f</i>	
Required Accuracy	<i>± 1% FS</i>		
Sample Condition	Press (PSIG) At Source Norm/Max	<i>ATMOSPHERIC</i>	<i>ATMOSPHERIC</i>
	Temp (°F) At Source Norm/Max	<i>100°F</i>	<i>100°F</i>
Fluid S.G.	<i>1.0</i>	<i>1.0</i>	
Electrode Assy Type	Submersion	<i>✓</i>	<i>✓</i>
	Flow		
	In-Line		
Ultrasonic Electrode Cleaner			
Area Class	<i>UNCLASSIFIED</i>	<i>unclassified</i>	
<i>F DATA TO BE CONFIRMED LATER</i>			

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF

CHANGE NO.

DATE 19 Dec 80

REQUISITION NO. 27-1910-1616-K

## 3.0 REQUIREMENTS

The analyser vendor shall provide a system which shall include a line or vessel mounted electrode assembly, a preamplifier and analyser, as described herein. The equipment shall be suitable for mounting in the hazardous area defined in Section 2.0.

## 4.0 REQUIRED ANALYSER OUTPUT

- 4.1 One isolated 4-20 ma output, proportional to the measured variable is required. The output will be fed to a microprocessor based control system located in the main control room. The main control room equipment will be supplied by others.
- 4.2 This output signal will be incorporated in an intrinsically safe system. The vendor shall therefore provide approval certification from any internationally recognised certifying authority (e.g. UL, FM, CSA) to demonstrate that the output signal is suitable. Any special requirements of the certification regarding the installation and assembly of the equipment shall be brought to the attention of the purchaser in writing within six weeks of receipt of order.
- 4.3 The analyser shall be installed in an enclosure and the receiver instruments in the main control room, a maximum distance of 750 ft. away. The vendor shall specify the requirements for the purchaser supplied cable between analyser house and control room within 6 weeks of receipt of order. Such details shall include where critical:
- Maximum Line Resistance.
  - Maximum Capacitance.
  - Shielding Requirements.
- 4.4 The preamplifier unit shall be mounted close to the electrode assembly. The vendor shall provide a specification for the purchaser supplied cable between electrode assembly and preamplifier. Likewise a specification is required for the cable between preamplifier and analyser. This specification is required within 6 weeks of receipt of order.

## 5.0 ANALYSER ENCLOSURE

- 5.1 The analyser shall be supplied in an enclosure weatherproofed to NEMA 4 standards, and suitable for the ambient conditions described in Section 10.0. The vendor shall also provide an air purge system to maintain a small positive pressure within the analyser case.
- 5.2 When installed in a hazardous area as described in Section 2.0 the analyser and associated equipment, must be suitably protected. Certification from an internationally recognised authority shall be provided by the vendor.

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 6 OF

CHANGE NO. 1

DATE 19 Dec 80

REQUISITION NO. 27-1910-1616-K

5.3 A heater shall be supplied by the analyser vendor if he considers it necessary to ensure year-round operation of the instrument. The heater shall be mounted within the enclosure.

5.4 The local indication of measured variable shall be visible when the door of the enclosure is closed.

## 6.0 UTILITIES

The following utilities will be available at the analyser location.

6.1 Electrical Supply - 115 volts  $\pm$  5%, 60HZ  $\pm$  3HZ single phase A.C.

6.2 Instrument Air Supply - Pressure - 100 PSIG  
Dew Point - -30°F  
Temperature - Ambient

6.3 Low Pressure Steam Supply - Pressure - 40 PSIG  
Temperature - 310°F  
Max - 390°F

6.4 Medium Pressure Steam - Pressure - 120 PSIG  
Temperature - 490°F  
Max - 550°F

6.5 Cooling Water - Pressure - 60 PSIG  
(Filtered Raw Water) Temperature - 85°F

6.6 The analyser manufacturer shall furnish a list of all utility requirements with quantity required for normal consumption.

## 7.0 INSPECTION

Upon completion of manufacture of the analyser system and prior to shipment, the analyser manufacturer shall perform complete functional and analytical tests on the analyser and sample system, the purchaser shall witness the tests. The manufacturer shall provide a suitable area for tests and shall provide all required test equipment including zero and span check gas mixtures.



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF

CHANGE NO.

DATE 19 Dec 80

REQUISITION NO. 27-1910-1616-K

## 8.0 DOCUMENTATION

The analyser system shall be furnished with the following documents indexed by analyser tag numbers:

- 8.1 Wiring drawings - certified.
- 8.2 Piping drawings - certified.
- 8.3 Fabrication drawings - certified.
- 8.4 Calibration curves.
- 8.5 Calibration procedures.
- 8.6 Operation and maintenance manuals.
- 8.7 Parts list.
- 8.8 Recommended spare parts list.
- 8.9 Statement of analyser accuracy and system performance guarantee.
- 8.10 Test certification - Analyser manufacturer shall furnish a section from recorder chart including the test period and indicating:
  - 8.10.1 Zero and span drift over the specified test period.
  - 8.10.2 Time, date and magnitude of any adjustments including zero, span, sample flow rate, cell temperature, etc.
  - 8.10.3 Notation of all span check and zero gas mixtures. Furnish copy of analysis certificates on all gases.
  - 8.10.4 Notation of settings critical to calibration including sample flow rates cell temp., etc.
- 8.11 Hazardous area certification.

## 9.0 PROPOSAL REQUIREMENTS

The analyser manufacturer is required to furnish the following information with his proposal:

- 9.1 Time from receipt of order to shipment of complete analyser package.
- 9.2 Performance guarantee including accuracy, reproducibility, linearity, and long and short term zero and span drift. State the maximum ambient temperature and primary A.C. voltage variations permitted while maintaining the stated performance. State the required frequency of calibration checks and adjustments.

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 8 OF

CHANGE NO. 1

DATE - 19 Dec 86

REQUISITION NO. -27-1910-1616-K

- 9.3 State maximum time for 90% response to a step change at sample inlet of 50% of span.
- 9.4 Price as separate item in proposal, services of a factory engineer for start-up, check-out, and instruction of owner's personnel.
- 9.5 List all expendable materials including filter elements, drierites, reagents, detector elements, sensitive tapes, etc., with normal service life and replacement cost of each item.
- 9.6 Furnish manufacturers standard catalog literature on analyser and sample system with method of analysis and characteristic of analyser.
- 9.7 Provide a detailed description of the proposed system listing any points which do not comply with this requisition.
- 9.8 State range for sample temperature pressure and flow for proper operation.
- 9.9 Identify any component or material with its concentration which when appearing in the sample stream will interfere with the desired measurement or cause analyzer degradation.

## 10.0 AMBIENT CONDITIONS

The ambient conditions at the analyzer location are as follows:

Maximum Ambient Temp	=	92°F
Minimum Ambient Temp	=	-10°F
Maximum Relative Humidity	=	95%
Barometric Pressure	=	14.21 psia



**REQUISITION**  
**FOSTER WHEELER ENERGY CORPORATION**

PAGE **A** OF **8**

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio			27-1910-1616-T		19 MAR 81	
MATERIAL	Conductivity Analyzer			C1		C5	
				C2		C6	
				C3		C7	
				C4		C8	

CHANGE INDEX

PG. NO.	REVISION										PG. NO.	REVISION									
	0	1	2	3	4	5	6	7	8	0		1	2	3	4	5	6	7	8		
A	0																				
1	0																				
2	0																				
3	0																				
4	0																				
5	0																				
6	0																				
7	0																				
8	0																				

NOTES:

BY: <i>WWA</i>	P.O. NO.	VENDOR
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FORM NO. 135-630



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

PAGE 1 OF



CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1616-L		19 MAR 81	
MATERIAL	Conductivity Analyzer			C1		C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	<u>L A T T R</u>			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

L A T T R COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1616-L  
 FWEC P.O. NO. \_\_\_\_\_  
 FOR: CONOCO/DOE

Pipeline Gas Demonstration Plant  
Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 133

- 1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
- 2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
- 3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF

CLIENT <u>Conoco/DOE</u>	CONTRACT NO. <u>15-1910</u>	REQUISITION NO.		DATE
SITE <u>Noble County, Ohio</u>	ITEM NO.	<u>27-1910-1616-L</u>		<u>19 MAR 81</u>
MATERIAL <u>Conductivity Analyser</u>		C1		C4
OR		C2		C5
SERVICE		C3		C6

### INDEX

	<u>Page</u>
1. Scope	3
2. Process Data	4
3. Requirements	5
4. Required Analyser Output	5
5. Analyser Enclosure	5
6. Utilities	6
7. Inspection	6
8. Documentation	6
9. Proposal Requirements	7
10. Ambient Conditions	8

FORM NO. 135-801

BY	P.O. NO.	SUPPLIER
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# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF

CHANGE NO. -

DATE 14 MAR 81

REQUISITION NO. 27-1910-1616-L

## 1.0 SCOPE

This inquiry covers the requirement for a continuous operating analyser system to monitor the process fluid described in Section 2.0 and provide a measurement of Conductivity. The analyser system is required for the Conoco/DOE Pipeline Gas Demonstration Plant, Noble County, Ohio.

1.2 The vendor shall supply one analyser unit per tag number. A listing of the tag numbers is given in Section 2.0.

FORM NO. 135-802



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 4 OF

CHANGE NO.		DATE	19 MAR 81		REQUISITION NO. 27-1910-1616-C				
2.0 <u>PROCESS DATA</u> (Conductivity Analysers)									
Cell Tag No.		AE-2742							
Transm. Tag No.		AT-2742							
Service		4 <sup>th</sup> WW 270502 LC							
Process Fluid		TREATED WATER							
Normal Conductivity		≠							
Required Inst. Range		≠							
Required Accuracy		+ 1% F. S.							
Sample Condition	Press (PSIG) At Source Norm/Max	≠							
	Temp (°F) At Source Norm/Max	AMBIENT							
Fluid At T									
Visc	SG	PH	.8	.997	.75				
Cell Type	Dip Cell								
	Screw Cell								
	Insertion Cell with removal device	✓							
Temp Man	Comp	Auto		✓					
Area Class		NONE							
≠ TO BE SUPPLIED WATER BY A-2722 EVAPORATOR PKY VENDOR									

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF

CHANGE NO.

DATE 19 MAR 81

REQUISITION NO. 27-1710-1616-L

## 3.0 REQUIREMENTS

The analyser vendor shall provide a system which shall include a line or vessel mounted conductivity cell, and analyser as described herein. The equipment shall be suitable for mounting in an area as classified in Section 2.0.

## 4.0 REQUIRED ANALYSER OUTPUT

4.1 One isolated 4-20 ma output, proportional to the measured variable, is required. The output will be fed to a microprocessor based control system located in the main control room. The main control room equipment will be supplied by others. A local indication of the measured variable is required within the analyser enclosure.

4.2 The output signal will be incorporated into an intrinsically safe system. The vendor shall therefore provide approval certification from any internationally recognised certifying authority (e.g. UL, FM CSA) to demonstrate that the output signal is suitable. Any special requirements of the certification regarding the installation and assembly of the equipment shall be brought to the attention of the purchaser in writing within six weeks of order.

4.3 The analyser vendor shall provide a specification for the cable linking cell and analyser, and analyser and control room. The maximum lengths of these cables shall be 250 ft. and 750 ft. respectively. This cable shall be supplied by the purchaser. Such details shall include where critical:

Maximum Line Resistance.  
Maximum Capacitance.  
Shielding Requirements.

This information shall be provided within six weeks of receipt of order.

4.4 From the process data given in Section 2.0 the vendor shall state whether or not a sample conditioning system is required. If required the vendor shall also include this as part of the system.

## 5.0 ANALYSER ENCLOSURE

5.1 The analyser shall be supplied in an enclosure weatherproofed to NEMA 4 standards, and suitable for the ambient conditions described in Section 10.0. The vendor shall also provide an air purge system to maintain a small positive pressure within the analyser case.

5.2 When installed in a hazardous area as described in Section 2.0 the analyser, and associated equipment must be suitably protected. Certification from an internationally recognised authority shall be provided by the vendor.

FORM NO. 135-802



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 6 OF

CHANGE NO.                      DATE 17 MAR 81                      REQUISITION NO. 27-1910-1616-L

5.3 A heater shall be supplied by the analyser vendor if he considers it necessary to ensure year-round operation of the instrument. The heater shall be mounted within the enclosure.

5.4 The local indication of measured variable shall be visible when the door of the enclosure is closed.

## 6.0 UTILITIES

The following utilities will be available at the analyser location.

6.1 Electrical Supply - 115 volts  $\pm$  5%, 60 HZ  $\pm$  3 HZ single phase A.C.

6.2 Instrument Air Supply - Pressure - 100 PSIG  
Dew Point -  $-30^{\circ}\text{F}$   
Temperature - Ambient

6.3 Low Pressure Steam Supply - Pressure - 40 PSIG  
Temperature -  $310^{\circ}\text{F}$   
Max -  $390^{\circ}\text{F}$

6.4 Medium Pressure Steam - Pressure - 120 PSIG  
Temperature -  $490^{\circ}\text{F}$   
Max -  $550^{\circ}\text{F}$

6.5 Cooling Water                      Pressure - 60 PSIG  
(Filtered Raw Water)                      Temperature -  $85^{\circ}\text{F}$

6.6 The analyser manufacturer shall furnish a list of all utility requirements with quantity required for normal consumption. Other utilities (plant air, 3 phase power, etc.) may be available on request.

## 7.0 INSPECTION

Upon completion of manufacture of the analyser system and prior to shipment, the analyser manufacturer shall perform complete functional and analytical tests on the analyser and sample system, the purchaser shall witness the tests. The manufacturer shall provide a suitable area for tests and shall provide all required test equipment including zero and span check gas mixtures.

## 8.0 DOCUMENTATION

The analyser system shall be furnished with the following documents indexed by analyser tag numbers:

- 8.1 Wiring drawings - certified.
- 8.2 Piping drawings - certified.
- 8.3 Fabrication drawings - certified.
- 8.4 Calibration curves.

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF

CHANGE NO.                      DATE 19 MAR 81                      REQUISITION NO. 27-1910-1616-L

- 8.5 Calibration procedures.
- 8.6 Operation and maintenance manuals.
- 8.7 Parts list.
- 8.8 Recommended spare parts list.
- 8.9 Statement of analyser accuracy and system performance guarantee.
- 8.10 Test certification - Analyser manufacturer shall furnish a section from recorder chart including the test period and indicating:
  - 8.10.1 Zero and span drift over the specified test period.
  - 8.10.2 Time, date and magnitude of any adjustments including zero, span, sample flow rate, cell temperature, etc.
  - 8.10.3 Notation of all span check and zero gas mixtures. Furnish copy of analysis certificates on all gases.
  - 8.10.4 Notation of settings critical to calibration including sample flow rate, cell temp., etc.
- 8.11 Hazardous area certification.

## 9.0 PROPOSAL REQUIREMENTS

The analyser manufacturer is required to furnish the following information with his proposal:

- 9.1 Time from receipt of order to shipment of complete analyser package.
- 9.2 Performance guarantee including accuracy, reproducibility, linearity, and long and short term zero and span drift. State the maximum ambient temperature and primary A.C. voltage variations permitted while maintaining the stated performance. State the required frequency of calibration checks and adjustments.
- 9.3 State maximum time for 90% response to a step change at sample inlet of 50% of span.
- 9.4 Price as separate item in proposal, services of a factory engineer for start-up, check-out, and instruction of owner's personnel.
- 9.5 List all expendable materials including filter elements, drierites, reagents, detector elements, sensitive tapes, etc., with normal service life and replacement cost of each item.
- 9.6 Furnish manufacturers standard catalog literature on analyser and sample system with method of analysis and characteristic of analyser.
- 9.7 Provide a detailed description of the proposed system listing any points which do not comply with this requisition.

FORM NO. 135-902



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 8 OF

CHANGE NO.

DATE 19 MAR 81

REQUISITION NO. 27-1910-1616-L

9.8 State range for sample temperature pressure and flow for proper operation.

9.9 Identify any component or material with its concentration which when appearing in the sample stream will interfere with the desired measurement or cause analyzer degradation.

## 10.0 AMBIENT CONDITIONS

The ambient conditions at the analyser location are as follows:

Maximum Ambient Temp	= 92°F
Minimum Ambient Temp	= -10°F
Maximum Relative Humidity	= 95%
Barometric Pressure	= 14.21 psia







# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1616-M		19 MAR 81	
MATERIAL	Specific Gravity & Density Analyzer			C1		C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATE			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATE COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	As shown on following pages
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1616-M
FWEC P.O. NO.	

FOR: CONOCO/DOE  
Pipeline Gas Demonstration Plant  
Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

**GENERAL NOTES**

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:  $\triangle$

FORM NO. 135-699A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 2 OF

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	27-1910-1616-M	19 MAR 81
MATERIAL	Specific Gravity & Density Analyzer	C1	C4	
OR		C2	C5	
SERVICE		C3	C6	

### INDEX

	<u>Page</u>
1. Scope	3
2. Process Data	4
3. Requirements	5
4. Required Analyser Output	5
5. Analyser Enclosure	5
6. Utilities	6
7. Inspection	6
8. Documentation	7
9. Proposal Requirements	7
10. Ambient Conditions	8

FORM NO. 135-801

BY	P.O. NO.	SUPPLIER
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# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 3 OF

CHANGE NO.

DATE 11/22/81

REQUISITION NO. 27-1910-1616-M

## 1.0 SCOPE

- 1.1 This inquiry covers the requirement for a continuously operating analyser system to monitor the process fluid described in Section 2.0 and provide a measurement of specific gravity. The analyser system is required for the Conoco/DOE Pipeline Gas Demonstration Plant, Noble County, Ohio.
- 1.2 The vendor shall supply one analyser system per Tag number. A listing of the Tag numbers is given in Section 2.0.



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 4 OF

CHANGE NO.		DATE	19 MAR 81		REQUISITION NO.	27-1910-1616-M	
2.0 <u>PROCESS DATA</u> SPECIFIC GRAVITY & DENSITY ANALYZER							
Cell Tag No.		AE-2743					
Transm. Tag No.		AT-2743					
Service		DENSITY					
Line No.		A-2722 EVAP RECYCLE					
Process Fluid		WATER					
Required Inst. Range		0.8 to 1.1					
Required Accuracy		± 1% FS					
Sample Condition	Press (PSIG) At Source Norm/Max	#					
	Temp (°F) At Source Norm/Max	#					
<u>Fluid At T</u>							
Visc.	Mw	SG	1.0				
Area Class		NONE					
Cell Type		/					
<p># DATA LATER FROM A-2722 EVAPORATOR PACKAGE VENDOR</p>							

FORM NO. 135-902



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 5 OF

CHANGE NO.

DATE 19 MAR 81

REQUISITION NO. 27-1910-1616-M

### 3.0 REQUIREMENTS

The analyser vendor shall provide a system which shall include a sampling and conditioning unit, and analyser as described herein. The equipment shall be mounted in a non-hazardous area.

### 4.0 REQUIRED ANALYSER OUTPUT

- 4.1 One isolated 4-20 ma output, proportional to the measured variable is required. The output will be fed to a microprocessor based control system located in the main control room. The main control room equipment will be supplied by others. Within the analyser case a meter shall be provided giving a local indication of the measured variable.
- 4.2 This output signal will be incorporated in an intrinsically safe system. The vendor shall therefore provide approval certification from any internationally recognised certifying authority (e.g. UL, FM, CSA) to demonstrate that the output signal is suitable. Any special requirements of the certification regarding the installation and assembly of the equipment shall be brought to the attention of the purchaser in writing within six weeks of receipt of order.
- 4.3 The analyser shall be installed in an enclosure and the receiver instruments in the main control room, a maximum distance of 750 ft. away. The vendor shall specify the requirements for the purchaser supplied cable between analyser house and control room within 6 weeks of receipt of order. Such details shall include where critical:

Maximum Line Resistance.  
Maximum Capacitance.  
Shielding Requirements.

- 4.4 The analyser vendor shall also provide a specification for the cable linking cell and analyser. This information is required within 6 weeks of receipt of order.

### 5.0 ANALYSER ENCLOSURE

- 5.1 The analyser shall be supplied in an enclosure weather proofed to NEMA 4 standards, and be suitable for the ambient conditions described in Section 10.0. The vendor shall also provide an air purge system to maintain a small positive pressure within the analyser case.

FORM NO. 195-802



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 6 OF

CHANGE NO.

DATE 14 MAR 81

REQUISITION NO. 27 - 1910-1616-M

5.2 A heater shall be supplied by the analyser vendor if he considers it necessary to ensure year-round operation of the instrument. The heater shall be mounted within the enclosure.

5.3 The local indication of measured variable shall be visible when the door of the enclosure is closed.

## 6.0 UTILITIES

The following utilities will be available at the analyser location.

6.1 Electrical Supply - 115 volts  $\pm$  5%, 60HZ  $\pm$  3HZ single phase A.C.

6.2 Instrument Air Supply - Pressure - 100 PSIG  
Dew Point -  $-30^{\circ}\text{F}$   
Temperature - Ambient

6.3 Low Pressure Steam Supply - Pressure - 40 PSIG  
Temperature -  $310^{\circ}\text{F}$   
Max -  $390^{\circ}\text{F}$

6.4 Medium Pressure Steam - Pressure - 120 PSIG  
Temperature -  $490^{\circ}\text{F}$   
Max -  $550^{\circ}\text{F}$

6.5 Cooling Water - Pressure - 60 PSIG  
(Filtered Raw Water) Temperature -  $85^{\circ}\text{F}$

6.6 The analyser manufacturer shall furnish a list of all utility requirements with quantity required for normal consumption.

## 7.0 INSPECTION

Upon completion of manufacture of the analyser system and prior to shipment, the analyser manufacturer shall perform complete functional and analytical tests on the analyser and sample system, the purchaser shall witness the tests. The manufacturer shall provide a suitable area for tests and shall provide all required test equipment including zero and span check gas mixtures.



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 7 OF

CHANGE NO.

DATE 19 MAR 81

REQUISITION NO. 27-1910-1616-n

## 8.0 DOCUMENTATION

The analyser system shall be furnished with the following documents indexed by analyser tag numbers:

8.1 Wiring drawings - certified.

8.2 Piping drawings - certified.

8.3 Fabrication drawings - certified.

8.4 Calibration curves.

8.5 Calibration procedures.

8.6 Operation and maintenance manuals.

8.7 Parts list.

8.8 Recommended spare parts list.

8.9 Statement of analyser accuracy and system performance guarantee.

8.10 Test certification - Analyser manufacturer shall furnish a section from recorder chart including the test period and indicating:

8.10.1 Zero and span drift over the specified test period.

8.10.2 Time, date and magnitude of any adjustments including zero, span, sample flow rate, cell temperature, etc.

8.10.3 Notation of settings critical to calibration including sample flow rates cell temp., etc.

## 9.0 PROPOSAL REQUIREMENTS

The analyser manufacturer is required to furnish the following information with his proposal:

9.1 Time from receipt of order to shipment of complete analyser package.

9.2 Performance guarantee including accuracy, reproducibility, linearity, and long and short term zero and span drift. State the maximum ambient temperature and primary A.C. voltage variations permitted while maintaining the stated performance. State the required frequency of calibration checks and adjustments.

FORM NO. 135-902





# REQUISITION

FOSTER WHEELER ENERGY CORPORATION

PAGE 8 OF

CHANGE NO.

DATE 19 MAR 81

REQUISITION NO. 27-1710-1616-M

9.3 State maximum time for 90% response to a step change at sample inlet of 50% of span.

9.4 Price as separate item in proposal, services of a factory engineer for start-up, check-out, and instruction of owner's personnel.

9.5 List all expendable materials including filter elements, drierites, reagents, detector elements, sensitive tapes, etc., with normal service life and replacement cost of each item.

9.6 Furnish manufacturers standard catalog literature on analyser and sample system with method of analysis and characteristic of analyser.

9.7 Provide a detailed description of the proposed system listing any points which do not comply with this requisition.

9.8 State range for sample temperature pressure and flow for proper operation.

9.9 Identify any component or material with its concentration which when appearing in the sample stream will interfere with the desired measurement or cause analyzer degradation.

## 10.0 AMBIENT CONDITIONS

The ambient conditions at the analyzer location are as follows:

Maximum Ambient Temp	=	92°F
Minimum Ambient Temp	=	-10°F
Maximum Relative Humidity	=	95%
Barometric Pressure	=	14.21 psia



# REQUISITION

SECTION 2700  
WASTE WATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1619-A		2 FEB 81	
MATERIAL	TRANSDUCER, ELECTRO PNEUMATIC (I/P-E/P)			C1	6 MAR 81	C4	
				C2		C5	
				C3		C6	

### DOCUMENTATION REQUIREMENTS

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER	—	—	—
B. WIRING DIAGRAMS	—	—	—	—
C. PIPING DIAGRAMS	—	—	—	—
D. CALCULATION OR CALIBRATION	—	—	—	—
E. DATA BOOK MATERIAL <sup>3</sup>	—	—	—	—

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8½ x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	As shown on following pages
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1619-A
FWEC P.O. NO.	—

FOR: CONOCO/DOE  
Pipeline Gas Demonstration Plant  
Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 133

1. IN 8½ x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8½ x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-899A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1619-A		2 FEB 81	
MATERIAL OR SERVICE	TRANSDUCER, ELECTRO PNEUMATIC (I/P - E/P)			C1	6 MAR 81	C4	
				C2		C5	
				C3		C6	

	Tag. No.	Tag No. of Asso. Eq.	Quan	Quan	Quan	Quan
	AY-2701-A	P-2710A/B		1		
	AY-2701-B	P-2709A/B			1	
	FY-2704-	FV-2704-	1			
	LY-2731	LV-2731	1			
Tag &	LY-2733	LV-2733	1			
Quantity	<del>LY-2761</del>	<del>LV-2761</del>	<del>1</del>			
Tabulation	LY-2766	LV-2766	1			
1 Total Required			4	1	1	
2 Manufacturer			Masonilan	Masonilan	Masonilan	
3 Series or Model No.			8006A	8006A	8006A	
General	4 Ele Class: CL/GR/Div.		- - -	- - -	- - -	
	5 Intrinsically Safe*/Explosion Proof		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6 Control Sys*: Vendor, Model or type No.					
	7					
	8					
	9 Mat'l: Die Cast Alum		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Body	10 Conn: PNEU inlet, outlet, vent=1/2 NPT FEMALE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	11 Conn: Ele=1/2 NPT FEMALE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	12 Mounting: 2" Pipe Stand/Yoke (surface)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13					
	14					
Options	15 Filter regulator/output Gage		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	16					
	17 Operation: Direct/Reverse		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	18 Split Range: 4-12 MA/12-20MA/Other		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	19 Temp Range: -40 to 150°F		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Service &	20 Input PRES: 5-8 psig above output Max*		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Character-	21 Ele Input; 1-5/4-20/10-15mAdc/1-9Vdc		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
istic	22 Output psig: 3-15/0-20/6-30/3-27/0-35		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	23 Output Adjustment: zero/span		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	24 Driven Element*: Valve/Positioner/Other		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	25 Air Consumption*: .15 to .50 SCFM		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	26 Input Impedance*: MFG STD/Other		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	27					
	28					

NOTES; \* Vendor to coordinate transducer input pressure, air consumption, input impedance with the requirements of the control system for intrinsic safety and with the driven element requirements for stroking & shutoff.

BY WCA P.O.NO. \_\_\_\_\_ SUPPLIER \_\_\_\_\_

FORM NO. 135-950



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1621-C		8 Dec 80	
MATERIAL	TEMPERATURE REGULATORS			C1	6 MAR-81	C4	
				C2		C5	
DOCUMENTATION REQUIREMENTS				C3		C6	

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. As shown on following pages  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1621-C  
 FWEC P.O. NO. \_\_\_\_\_

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-699A



# REQUISITION

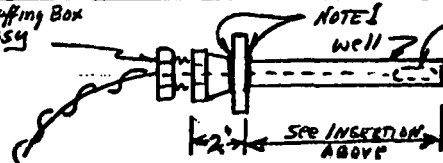
FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	NOBLE COUNTY, OHIO	ITEM NO.		27-1910-1621-C		8 Dec 80	
MATERIAL	Temperature Regulators	C1	6 mae81	C4			
		C2		C5			
		C3		C6			
GENERAL	1 TAG NO./QTY	TCV-2701	1	TCV-2704	1	TCV-2708	1
	2 SERVICE	HEATING D-2701		HEATING D-2702		HEATING TK-2717	
	3 LINE NO. OR EQUIPMENT NO.	156270121 Af		156270119 Af		156270610 Af	
	4						
	5 MANUFACTURER OR EQUAL	LESLIE CO		LESLIE CO		LESLIE CO	
	6 SERIES OR MODEL NO.						
Control Valve	7 Size: Body/Trim	1"		1"		1"	
	8 Seats: Single/Double	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	9 Conn. Rating	150 <sup>o</sup> RF					
	10 Body Material	C.S					
	11 Trim Form	Quick Opening					
	12 Trim Material	416 + STERITE					
	13 Action: Direct/Reverse	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	14 FAILS & OPEN / CLOSED	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	15 Fluid	STEAM L.P		STEAM L.P		STEAM L.P	
	16 P <sub>1</sub> in Press PSIA	54		54		54	
	17 P <sub>2</sub> out Press. PSIA	34		34		34	
	18 Flow Rate Max./Min. #	100   0		100   0		600   150 #	
	19 T <sub>sh</sub> (°F superheat)	23°F		23°F		23°F	
	20 ACCESSORY (CAL DIALS REPLASMA-BRA)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
21							
22 Cv (Calc. by Vendor)							
ELEMENT	23 TYPE/CLASS	LINIO FILLED	IB				
	24 PROCESS DATA: T NORM./T MAX.	70	120				
	25 PROCESS DATA: P NORM./P MAX.	0	16				
	26 RANGE	50 ± 150°F					
	27 SPAN	100°F					
	28 OVERRANGE PROTECTION	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	29 BULB: DIAMETER/LENGTH	5/8" 00	4 13/16				
	30 BULB: MAT'L/INSERTION	18-8SS					
	31 BULB: CONNECTION						
	32 BULB: LOCATION V/S CASE	BELOW VALVE	BELOW VALVE		ABOVE VALVE		
	33 EXTENSION: LENGTH/TYPE						
	34 CAPILLARY: LENGTH/MAT'L	10'	316SS	10'	316SS	10'	316SS
	35 CAPILLARY: ARMOR/ARMOR MAT'L	SPIRAL	316SS				
	36 WELL: TYPE/MAT'L SEE BELOW	INSTR	316SS				
	37 WELL CONN.: TYPE/RATING	RF	150°				
	38 WELL: LAG EXT./INSERTION	2"	28"	2"	28"	2"	18"
	39 Element Mounting	TOP D-2701		TOP D-2702		SIDE TK-2717	
	40 TEMP SET POINT CONTROL	70°F		70°F		70°F	
41 FLUID	CAUSTIC NaOH		Sulfuric Acid H <sub>2</sub> SO <sub>4</sub>		SLUDGE		
42							
43							
44							
45							

FORM NO. 135-602A

NOTES: 1. Seal weld 1 1/2" - 150°F flange to well BOTH SIDES of FLANGE

Stuffing Box Assy



\* DATA TO BE CONFIRMED LATER

BY WWA

P. O. NO.

VENDOR



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	NOBLE COUNTY, OHIO	ITEM NO		27-1910-1621-C		8 Dec 80	
MATERIAL	Temperature Regulators			C1	6 MAR 81	C4	
				C2		C5	
				C3		C6	

GENERAL	1	TAG NO./QTY.	TCV-2759	1	TCV-2760	1	TCV-2721	1
	2	SERVICE	HEATING TK-2701		HEATING TK-2702		HEATING TK-2718	
	3	LINE NO. OR EQUIPMENT NO.	25L220616 Af		25L270632 Af		25L270327 Af	
	4							
	5	MANUFACTURER OR EQUAL	Leslie Co		Leslie Co		Leslie Co	
	6	SERIES OR MODEL NO.						
Control Valve	7	Size: Body/Trim	1 1/2"		1 1/2"		1 1/2" EST	
	8	Seats: Single/Double	<input checked="" type="checkbox"/> <input type="checkbox"/>		<input checked="" type="checkbox"/> <input type="checkbox"/>		<input checked="" type="checkbox"/> <input type="checkbox"/>	
	9	Conn. Rating	150# RF		150# RF		150# RF	
	10	Body Material	CARBON STEEL		CARBON STEEL		CARBON STEEL	
	11	Trim Form	QUICK OPENING		QUICK OPENING		QUICK OPENING	
	12	Trim Material	#16SS+STELLITE		#16SS+STELLITE		#16SS+STELLITE	
	13	Action: Direct/Reverse	<input type="checkbox"/> <input checked="" type="checkbox"/>		<input type="checkbox"/> <input checked="" type="checkbox"/>		<input type="checkbox"/> <input checked="" type="checkbox"/>	
	14	FAILS: OPEN/CLOSED	<input type="checkbox"/> <input checked="" type="checkbox"/>		<input type="checkbox"/> <input checked="" type="checkbox"/>		<input type="checkbox"/> <input checked="" type="checkbox"/>	
	15	Fluid	STEAM L.P.		STEAM L.P.		STEAM L.P.	
	16	P <sub>1</sub> in Press PSIA	55		55		54	
	17	P <sub>2</sub> out Press. PSIA	45		45		34	
	18	Flow Rate Max./Min. #/HR	1000 ± 250 ±		1000 ± 250 ±		±	
	19	T <sub>sh</sub> (°F superheat)	23°F		23°F		23°F	
	20	Accessory (CAL DIAL & REPLACING BUB)	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
21								
22	Cv (Calc. by Vendor)							
ELEMENT	23	TYPE/CLASS	LIQUID FILLED	IB	LIQUID FILLED	IB	LIQUID FILLED	IB
	24	PROCESS DATA: T NORM./T MAX. °F	180	200	180	200	70	120
	25	PROCESS DATA: P NORM./P MAX. PSIG	5		5		0	16
	26	RANGE	120 to 220°F		→		50 to 150°F	
	27	SPAN	100°F		→		100°F	
	28	OVERRANGE PROTECTION	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	29	BULB: DIAMETER/LENGTH	3/8" OD	4 1/2"	→	→	3/8" OD	4 1/2"
	30	BULB: MAT'L/INSERTION	18-8SS		→	→	18-8SS	
	31	BULB: CONNECTION						
	32	BULB: LOCATION V/S CASE	ABOVE VALVE		→	→	ABOVE VALVE	
	33	EXTENSION: LENGTH/TYPE						
	34	CAPILLARY: LENGTH/MAT'L	15"	316SS	→	→	10"	316SS
	35	CAPILLARY: ARMOR/ARMOR MAT'L	SPIRAL	316SS	→	→	SPIRAL	316SS
	36	WELL: TYPE/MAT'L See B flow	Mfg STD	316SS	→	→	Mfg STD	316SS
	37	WELL CONN.: TYPE/RATING	RF FLANGE	150#	→	→	RF FLANGE	150#
	38	WELL: LAG EXT./INSERTION	2"	18"	→	→	2"	18"
	39	Element Mounting	SIDE TK-2701		SIDE TK-2702		SIDE TK-2718	
	40	TEMP SET POINT CONTROL	180°F		180°F		70°F	
	41	FLUID	SLOP OIL		SLOP OIL		H <sub>2</sub> O + SLUDGE	
42								
43								
44								
45								

NOTES: 1. Seal weld 1 1/2" ISO RF flange to well BOTH SIDES of flange.

± DATA TO BE CONFIRMED LATER

BY WWT P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_

FORM NO. 135-602A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO.	-	27-1910-1622-A	8 Dec 80
MATERIAL	Control Valves			C1 6 MAR 81	C4
				C2	C5
				C3	C6

### DOCUMENTATION REQUIREMENTS

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE:

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

- II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. (As shown on following pages)  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1622-A  
 FWEC P.O. NO.

FOR: Conoco/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

- III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 133

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910-1600A IS PART OF THIS REQUISITION.
- II. GENERAL NOTES REQUISITION 1910-1620A IS PART OF THIS REQUISITION.
- III. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:  $\triangle$

FORM NO. 135-695A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE	Noble County, Ohio				27-1910-1622-A		8 Dec 80	
MATERIAL	CONTROL VALVES				C1	6 MAR 81	C4	
					C2		C5	
					C3		C6	
GENERAL	1	TAG NUMBER	QUANTITY	FY-2704 1				
	2	LINE OR EQUIPMENT NO.	4" WW 27017LC					
	3	MANUFACTURER	Masonel Lan					
	4	SERIES OR MODEL NO.	20,000					
BODY	5	SIZE: BODY/TRIM	3" Cv 110					
	6	TYPE: GLOBE/ANGLE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7	GUIDING: CAGE/STEM/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7A	SEATS: SINGLE/DOUBLE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8	CONN. RATING: 300 ANSI RF/NPT/	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8A	ANSI RF/ RTJ/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9	BODY MAT'L C.S./ S.S./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10	PACKING: TEF. ASB./GRAPHITE/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11	LUBRICATOR/ISO. VALVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12	BONNET: PLAIN/NORMALIZING/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13	TRIM FORM: %/LINEAR/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13A	TRIM TYPE: BALANCED/UNBALANCED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14	TRIM MAT'L: 316 S.S./STEL./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	REQUIRED SEAT TIGHTNESS, ANSI CL.	II						
16	MAX dBA: 90dB/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ACTUATOR	17	TYPE: SPRING & DIAP./SPRINGLESS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	18	DOUBLE-ACTING PISTON/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	19	Δ P FOR SIZING PURPOSES						
	20	FLOW: OPENS/CLOSES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	21	FAILS: OPEN/CLOSED/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	22	HANDWHEEL - LOCATION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
POSITIONER	23	TYPE: PNEUMATIC/ELECTRO.PNEUM.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	24	FILT. REG./GAGES/BYPASS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	25	INPUT: 3-15 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	26	OUTPUT: DIRECT/REVERSE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	27	SUPPLY PRESSURE: 40 PSIG/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
OPTIONS	28	Sol. Vlv. Details on pg.						
	29	Tag Number						
	30	Type Number						
	31	Minimum Flow Stop	<input checked="" type="checkbox"/>					
	32							
	33							
SERVICE	34	FLOW UNITS						
	35	FLUID	WATER					
	36	QUANT. MAX. <sup>3/4</sup> CV	113,000 74					
	37	QUANT. OPER. <sup>1/2</sup> CV	79,000 65					
	38	VALVE CV	110					
	39	P. NORM.	Δ P NORM.	37psia 17psia				
	40	P. MAX.	Δ P MAX.	37psia 17psia				
	41							
	42	TEMP. MAX.	TEMP. OPER.	Ambient				
	43	OPER. SPGR.	M.W.	1.0				
44	OPER. VISC.	% FLASHING	1.0					
45	° SUPERHEAT	% SOLIDS						
46	VAPOR PRESS.	CRIT. PRESS.	1.0 3206					
BY	WWT		P. O. NO.	VENDOR				

FORM NO. 135-628A





# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.	-	27-1910-1623-A		8 Dec 80	
MATERIAL	Control Valves			C1	6 MAR 81	C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER →			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION	↓			
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. (As shown on following pages)  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1623-A  
 FWEC P.O. NO. \_\_\_\_\_

FOR: Conoco/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 133

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910-1600A IS PART OF THIS REQUISITION.
- II. GENERAL NOTES REQUISITION 1910-1620A IS PART OF THIS REQUISITION.
- III. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:  $\Delta$

FORM NO. 135-695A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE	Noble County, Ohio				27-1910-1623-A		8 Dec 80	
MATERIAL	CONTROL VALVES				C1	6 MAR 81	C4	
					C2		C5	
					C3		C6	
GENERAL	1	TAG NUMBER	LV-2731	1	LV-2733	1	LV-2766	1
	2	LINE OR EQUIPMENT NO.	FW270301LC		FW270311LC		FW270504LC	
	3	MANUFACTURER OR EQUAL	Masonite/Am		MASONITE/Am		MASONITE/Am	
	4	SERIES OR MODEL NO.	20,000		20,000		20,000	
BODY	5	SIZE: BODY/TRIM	3" Cv=110		3" Cv=110		4" Cv=113	
	6	TYPE: GLOBE/ANGLE/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	7	GUIDING: CAGE/STEM/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	7A	SEATS: SINGLE/DOUBLE	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	8	CONN. RATING: 300 = ANSI RF/NPT/	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	8A	= ANSI RF/ = RTJ/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	9	BODY MAT'L C.S./ S.S./OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	10	PACKING: TEF. ASB./GRAPHITE/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	11	LUBRICATOR/ISO. VALVE	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	12	BONNET: PLAIN/NORMALIZING/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	13	TRIM FORM: = %/LINEAR/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	13A	TRIM TYPE: BALANCED/UNBALANCED	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
14	TRIM MAT'L: 416 S.S./STEL./OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
15	REQUIRED SEAT TIGHTNESS. ANSI CL.	II		II		II		
16	MAX dBA: 90dB/OTHER							
ACTUATOR	17	TYPE: SPRING & DIAP./SPRINGLESS	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	18	DOUBLE-ACTING PISTON/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	19	Δ P FOR SIZING PURPOSES :						
	20	FLOW: OPENS/CLOSES	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	21	FAILS: OPEN/CLOSED/OTHER	<input type="checkbox"/> Locked		<input type="checkbox"/> Locked		<input type="checkbox"/>	<input type="checkbox"/>
22	HANDWHEEL - LOCATION	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
POSITIONER	23	TYPE: PNEUMATIC/ELECTRO.PNEUM.	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	24	FILT. REG./GAGES/BYPASS	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	25	INPUT: 3-15 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	26	OUTPUT: DIRECT/REVERSE	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	27	SUPPLY PRESSURE: 40 PSIG/OTHER	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
OPTIONS	28	Sol. Vly. Details on pg.						
	29	Tag Number						
	30	Type Number						
	31							
	32							
SERVICE	34	FLOW UNITS						
	35	FLUID	WATER		FILTER EFFLUENT		WATER	
	36	QUANT. MAX. $\frac{1}{4}$ " CV	113,000	59	113,000	58	140,000	73
	37	NOTE: QUANT. OPER. $\frac{1}{4}$ " CV	76,000	32	69,000	29	96,590	45
	38	VALVE CV	110		110		113	
	39	P. NORM. P <sub>61A</sub>	60	23	65	23	92	19
	40	P. MAX.			65	31	92	20
	41							
	42	TEMP. MAX.		200		200		100
	43	OPER. SPGR.	1.0		1.0		1.0	
44	OPER. VISC.							
45	° SUPERHEAT							
46	VAPOR PRESS.	1.0	3206	1.0	3206	1.0	3206	
BY	WVA		P. O. NO.		VENDOR			

FORM NO. 135-826A



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO. -	27-1910-1624-C	11 Dec 80
MATERIAL	Control Valves (Pressure Regulators)		C1 6-mm 81	C4
			C2	C5
<b>DOCUMENTATION REQUIREMENTS</b>			C3	C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) DRIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO. (As shown on following pages)  
 FWEC CONTRACT NO. 15-1910  
 FWEC REQ'N. NO. 27-1910-1624-C  
 FWEC P.O. NO.

FOR: Conoco/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910-1600A IS PART OF THIS REQUISITION.
- II. GENERAL NOTES REQUISITION 1910-1620A IS PART OF THIS REQUISITION.
- III. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:  $\Delta$

FORM NO. 135-699A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE
SITE	Noble County, Ohio		27-1910-1624-C		11 Dec 80		
MATERIAL	Pressure Regulators		C1	6 MAR 81	C4		
			C2		C5		
			C3		C6		

GENERAL	TAG NUMBER	QUANTITY	PCV-2719A	PCV-2719B	PCV-2719C		
2	LINE OR EQUIPMENT NO.		TK-2702	TK-2702	TK-2702		
3	MANUFACTURER		FISHER REG.				
4	SERIES OR MODEL NO.		TYPE Y 600	TYPE 912	TYPE 66		
5	SIZE: BODY/TRIM		3/4" 1/2"	3/4" 1/2"	3/4" 1/2"		
6	TYPE: GLOBE/ANGLE/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	GUIDING: CAGE/STEM/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7A	SEATS: SINGLE/DOUBLE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	CONN. RATING: ANSI RF/NPT/		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8A	ANSI RF/ RTJ/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	BODY MAT'L C.S./ S.S./OTHER		CAST IRON	ZINC	CAST IRON		
10	PACKING: TEF. ASB./GRAPHITE/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	LUBRICATOR/ISO. VALVE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	BONNET: PLAIN/NORMALIZING/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	TRIM FORM: %/LINEAR/OTHER		<input type="checkbox"/> QUICK OPEN	<input type="checkbox"/> QUICK OPEN	<input type="checkbox"/> QUICK OPEN	<input type="checkbox"/>	<input type="checkbox"/>
13A	TRIM TYPE: BALANCED/UNBALANCED		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	TRIM MAT'L: S.S./STEL./OTHER		Mfg STD	Mfg STD	Mfg STD		
15	REQUIRED SEAT TIGHTNESS, ANSI CL.		IV	IV	IV		
16	MAX dBA: 90dB/OTHER					<input type="checkbox"/>	<input type="checkbox"/>
17	TYPE: SPRING & DIAP./SPRINGLESS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	DOUBLE-ACTING PISTON/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Δ P FOR SIZING PURPOSES						
20	FLOW: OPENS/CLOSES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	FAILS: OPEN/CLOSED/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	HANDWHEEL - LOCATION		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	TYPE: PNEUMATIC/ELECTRO.PNEUM.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	FILT.REG./GAGES/BYPASS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	INPUT: 3-15 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	OUTPUT: DIRECT/REVERSE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	SUPPLY PRESSURE: 40 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Sol. Vlv. Details on pg.						
29	Tag Number						
30	Type Number						
31							
32							
33							
34	FLOW UNITS						
35	FLUID		NITROGEN	NITROGEN	NITROGEN		
36	QUANT. MAX. SCFH		PRES SENSOR	SENSOR FEED	600	<input checked="" type="checkbox"/>	
37	NOTE: QUANT Max. CV						
38	VALVE CV						
39	P1 (Inlet) P2 (Outlet)		20" WC 2" WC	1 PSIG 20" WC	1 PSIG 2" WC		
40	Pressure Reducing/Backpres		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41	Comp. Factor		1.0	1.0	1.0		
42	TEMP. MAX. TEMP. OPER. °F		85	85	85		
43	OPER. SPGR. M.W.		28	28	28		
44	OPER. VISC. % FLASHING		.018	.018	.018		
45	° SUPERHEAT % SOLIDS						
46	VAPOR PRESS. CRIT. PRESS.						

BY	WVA	P. O. NO.	VENDOR
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FORM NO. 135-628A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio		27-1910-1624-C	11 Dec 80
MATERIAL	Pressure Regulators		C1 6 MAR 81	C4
			C2	C5
			C3	C6

GENERAL	1	TAG NUMBER	QUANTITY	PCV-2797	1	PCV-2798	1	PCV-2798B	1	PCV-2798C	1
	2	LINE OR EQUIPMENT NO.		15N270627A		TK-2701		TK-2701		TK-2701	
	3	MANUFACTURER		FISHER REG							
	4	SERIES OR MODEL NO.		TYPE 99		TYPE Y600		TYPE 912		TYPE 66	
BODY	5	SIZE: BODY/TRIM		1"   1/4"		3/4"   1/2"		3/4"   1/2"		3/4"   1/2"	
	6	TYPE: GLOBE/ANGLE/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	7	GUIDING: CAGE/STEM/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	7A	SEATS: SINGLE/DOUBLE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8	CONN. RATING: 150# ANSI RF/NPT/		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8A	ANSI RF/ RTJ/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	9	BODY MAT'L C.S./ S.S./OTHER		<input type="checkbox"/> CAST IRON		<input type="checkbox"/> CAST IRON		<input type="checkbox"/> ZINC		<input type="checkbox"/> CAST IRON	
	10	PACKING: TEF. ASB./GRAPHITE/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	11	LUBRICATOR/ISO. VALVE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	12	BONNET: PLAIN/NORMALIZING/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	13	TRIM FORM: %/LINEAR/OTHER		<input type="checkbox"/> QUICK OPEN		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	13A	TRIM TYPE: BALANCED/UNBALANCED		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
14	TRIM MAT'L: S.S./STEL./OTHER		<input type="checkbox"/>		<input type="checkbox"/> Mfg STD		<input type="checkbox"/> Mfg STD		<input type="checkbox"/> Mfg STD		
15	REQUIRED SEAT TIGHTNESS, ANSI CL.		IV		IV		IV		IV		
16	MAX dBA: 90dB/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
ACTUATOR	17	TYPE: SPRING & DIAP./SPRINGLESS		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	18	DOUBLE-ACTING PISTON/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	19	A P FOR SIZING PURPOSES									
	20	FLOW: OPENS/CLOSES		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	21	FAILS: OPEN/CLOSED/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	22	HANDWHEEL - LOCATION		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
POSITIONER	23	TYPE: PNEUMATIC/ELECTRO.PNEUM.		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	24	FILT. REG./GAGES/BYPASS		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	25	INPUT: 3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	26	OUTPUT: DIRECT/REVERSE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
OPTIONS	27	SUPPLY PRESSURE: 40 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	28	Sol. Vlv. Details on pg.									
	29	Tag Number									
	30	Type Number									
	31										
	32										
	33										
	34	FLOW UNITS									
SERVICE	35	FLUID		NITROGEN							
	36	QUANT. MAX. SCFH		1200		✓	PRES SENSOR	SENSOR FEED	600	✓	
	37	QUANT. MAX. CV									
	38	VALVE CV									
	39	P1 (Inlet) P2 (Outlet)		69.24A 1PSIG	20 WC	2 WC	1PSIG	20 WC	1PSIG	2 WC	
	40	Pressure Reducing/Backpres		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	41	Comp. Factor		1		1		1		1	
	42	TEMP. MAX. TEMP. OPER. °F			85		85		85		85
	43	OPER. SPGR. M.W.			28		28		28		28
	44	OPER. VISC. % FLASHING		.018		.018		.018		.018	
45	° SUPERHEAT % SOLIDS										
46	VAPOR PRESS. CRIT. PRESS.										

FORM NO. 135-626A

BY WVA P. O. NO. \_\_\_\_\_ VENDOR \_\_\_\_\_



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION

CLIENT	Conoco/DOE	CONTRACT NO. 15-1910	REQUISITION NO.	DATE
SITE	Noble County, Ohio	ITEM NO. -	27-1910-1625-B	11 Dec 80
MATERIAL	Control Valves		C1 6-MAR 81	C4
			C2	C5
DOCUMENTATION REQUIREMENTS			C3	C6

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER →	_____	_____	_____
B. WIRING DIAGRAMS	_____	_____	_____	_____
C. PIPING DIAGRAMS	_____	_____	_____	_____
D. CALCULATION OR CALIBRATION	_____	_____	_____	_____
E. DATA BOOK MATERIAL <sup>3</sup>	_____	_____	_____	_____

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8½ x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

A CROSS REFERENCE INDEX FROM TAG NO. TO INSTRUCTION MANUAL IDENTIFICATION SHALL BE PROVIDED. AS A MINIMUM EACH SET SHALL INCLUDE.

- (1) INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS.
- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
- (4) ORIFICE CALCULATION SHEETS (WHERE APPLICABLE).
- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

II. THE FOLLOWING IDENTIFICATION IS REQUIRED ON ALL DATA:

TAG NO.	(As shown on following pages)
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1625-B
FWEC P.O. NO.	_____

FOR: Conoco/DOE  
Pipeline Gas Demonstration Plant  
Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 135

1. IN 8½ x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8½ x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

**GENERAL NOTES**

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. GENERAL NOTES REQUISITION 1910-1620A IS PART OF THIS REQUISITION.
- III. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:  $\Delta$

FORM NO. 135-699A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 2

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE		
SITE	Noble County, Ohio				27-1910-1625-B		11 Dec 80		
MATERIAL	CONTROL VALVES				C1	6 MAR 81	C4		
					C2		C5		
					C3		C6		
GENERAL	1	TAG NUMBER	QUANTITY	WCV-2710	1	WCV-2731	1	WCV-2742	1
	2	LINE OR EQUIPMENT NO.		4"AP270219LC		6"AP270229LC		3"AP270220LC	
	3	MANUFACTURER OR EQUAL		Masonellan		Masonellan		Masonellan	
	4	SERIES OR MODEL NO.		37000		3700		37000	
BODY	5	SIZE: BODY/TRIM		3	CV=180	4"	CV=390	2"	CV=54
	6	TYPE: GLOBE/ANGLE/OTHER		<input type="checkbox"/>	BUTTERFLY	<input type="checkbox"/>	BUTTERFLY	<input type="checkbox"/>	BUTTERFLY
	7	GUIDING: CAGE/STEM/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	7A	SEATS: SINGLE/DOUBLE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8	CONN. RATING: 300 • ANSI RF/NPT/		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8A	• ANSI RF/ • RTJ/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	9	BODY MAT'L C.S./ S.S./OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	10	PACKING: TEF. ASB./GRAPHITE/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	11	LUBRICATOR/ISO. VALVE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	12	BONNET: PLAIN/NORMALIZING/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	13	TRIM FORM: %/LINEAR/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	13A	TRIM TYPE: BALANCED/UNBALANCED		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	14	TRIM MAT'L: 1/2 S.S./STEL./OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
15	REQUIRED SEAT TIGHTNESS. ANSI CL.			II		II		II	
16	MAX dBA: 90dB/OTHER								
ACTUATOR	17	TYPE: SPRING & DIAP./SPRINGLESS		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	18	DOUBLE-ACTING PISTON/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	19	Δ P FOR SIZING PURPOSES							
	20	FLOW: OPENS/CLOSES		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	21	FAILS: OPEN/CLOSED/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	22	HANDWHEEL - LOCATION			RIGHT SIDE		RIGHT SIDE		RIGHT SIDE
POSITIONER	23	TYPE: PNEUMATIC/ELECTRO-PNEUM.		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	24	FILT. REG./GAGES/BYPASS		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	25	INPUT: 3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	26	OUTPUT: DIRECT/REVERSE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	27	SUPPLY PRESSURE: 40 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
OPTIONS	28	Sol. Vlv. Details on pg.							
	29	Tag Number							
	30	Type Number							
	31								
	32								
	33								
SERVICE	34	FLOW UNITS							
	35	FLUID	AIR		AIR		AIR		
	36	QUANT. MAX. #/HR CV	2827	172	8406	302	1146	49	
	37	QUANT. OPER. #/HR CV	1977	120	5878	211	802	33	
	38	VALVE CV	180		390		54		
	39	P. NORM. PSIA	22	2	22	2	23	1	
	40	P. MAX. PSIA							
	41	COMPRESSION FACTOR	.97		.97		.97		
	42	TEMP. MAX.		175		175		175	
	43	OPER. SPGR.		29		29		28.4	
44	OPER. VISC.	.02		.02		.02			
45	° SUPERHEAT								
46	VAPOR PRESS.								
BY	WVA		P. O. NO.		VENDOR				

FORM NO. 135-626A



**REQUISITION**

**FOSTER WHEELER ENERGY CORPORATION**

CLIENT	Conoco/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1625-C		11 Dec 80	
MATERIAL	Control Valves			C1	6 MAR 81	C4	
				C2		C5	
<b>DOCUMENTATION REQUIREMENTS</b>				C3		C6	

I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATE	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
A. OUTLINE DIMENSIONS	LATER			
B. WIRING DIAGRAMS				
C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

LATER COMPOSITE INSTRUCTION SETS OF DESCRIPTIVE DATA SUITABLE FOR INSERTION IN FWEC 8 1/2 x 11 MECHANICAL CATALOG BINDER ARE REQUIRED FOR EACH CONTRACT NO.

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- (2) SECTIONAL DWGS. WITH COMPLETE PARTS LIST & IDENTIFICATION.
- (3) A PRINT OF THE FINAL ISSUE OF EACH CERTIFIED DRAWING.
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- (5) LEVEL CALCULATION SHEETS FOR D/P LEVEL INST. (WHERE APPLICABLE).

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TAG NO.	(As shown on following pages)
FWEC CONTRACT NO.	15-1910
FWEC REQ'N. NO.	27-1910-1625-C
FWEC P.O. NO.	

FOR: Conoco/DOE  
Pipeline Gas Demonstration Plant  
Noble County, Ohio

III. ALL DATA TRANSMITTALS SHOULD BE DIRECTED TO: FOSTER WHEELER ENERGY CORP.  
110 SOUTH ORANGE AVENUE  
LIVINGSTON, NJ 07039  
ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
DEPT. 135

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FORM NO. 135-609A





# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF 3

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE	Noble County, Ohio				27-1910-1625-C		11 Dec 80	
MATERIAL	CONTROL VALVES				C1	6 MAR 81	C4	
					C2		C5	
					C3		C6	
GENERAL	1	TAG NUMBER	QUANTITY	HCV-2744	1			
	2	LINE OR EQUIPMENT NO.		27AV270318Lc				
	3	MANUFACTURER		Masonellan				
	4	SERIES OR MODEL NO.		11				
BODY	5	SIZE: BODY/TRIM		1/2"	CV-2			
	6	TYPE: GLOBE/ANGLE/OTHER		<input checked="" type="checkbox"/> REGULATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7	GUIDING: CAGE/STEM/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	7A	SEATS: SINGLE/DOUBLE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8	CONN. RATING:		<input checked="" type="checkbox"/> ANSI RF/NPT/	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	8A			<input type="checkbox"/> ANSI RF/	<input type="checkbox"/> RTJ/OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	9	BODY MAT'L C.S./	S.S./OTHER	<input type="checkbox"/>	<input checked="" type="checkbox"/> BRASS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	10	PACKING: TEF. ASB./GRAPHITE/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	11	LUBRICATOR/ISO. VALVE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	12	BONNET: PLAIN/NORMALIZING/OTHER		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13	TRIM FORM: %/LINEAR/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	13A	TRIM TYPE: BALANCED/UNBALANCED		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	14	TRIM MAT'L:	S.S./STEL./OTHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	15	REQUIRED SEAT TIGHTNESS. ANSI CL.			IV			
	16	MAX dBA: 90dB/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACTUATOR	17	TYPE: SPRING & DIAP./SPRINGLESS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	18	DOUBLE-ACTING PISTON/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	19	Δ P FOR SIZING PURPOSES						
	20	FLOW: OPENS/CLOSES		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	21	FAILS: OPEN/CLOSED/OTHER		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	22	HANDWHEEL - LOCATION		<input checked="" type="checkbox"/>	TOP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POSITIONER	23	TYPE: PNEUMATIC/ELECTRO.PNEUM.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	24	FILT. REG./GAGES/BYPASS		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	25	INPUT: 3-15 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	26	OUTPUT: DIRECT/REVERSE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	27	SUPPLY PRESSURE: 40 PSIG/OTHER		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OPTIONS	28	Sol. Vlv. Details on pg.						
	29	Tag Number						
	30	Type Number						
	31	GAUGES - INLET & OUTLET						
	32							
	33							
SERVICE	34	FLOW UNITS						
	35	FLUID	PLANT AIR					
	36	QUANT. MAX. #/HR CV	29	0.11				
	37	QUANT. OPER. #/HR CV	20	0.08				
	38	VALVE CV	2					
	39	P. NORM.	Δ P NORM.	114	75			
	40	P. MAX.	Δ P MAX.					
	41							
	42	TEMP. MAX.	TEMP. OPER.		100			
	43	OPER. SPGR.	M.W.		28.4			
NOTE: FILL IN ONLY IF COMPUTER CALCULATION SHEETS ARE NOT USED	44	OPER. VISC.	% FLASHING	0.02				
	45	° SUPERHEAT	% SOLIDS					
	46	VAPOR PRESS.	CRIT. PRESS.					
	46							
BY	WWA		P. O. NO.		VENDOR			

FORM NO. 135-625A



# REQUISITION

FOSTER WHEELER ENERGY CORPORATION PAGE 3 OF 3

CLIENT	Conoco/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE				
SITE	Noble County, Ohio				27-1910-1625-C		11 Dec 80				
MATERIAL	CONTROL VALVES		C1	6 MAR 81	C4						
			C2		C5						
			C3		C6						
GENERAL	1	TAG NUMBER	QUANTITY	HCV-2745	1	HCV-2746	1	HCV-2785	1	HCV-2786	1
	2	LINE OR EQUIPMENT NO.		2AU270318 LC		2AU270318 LC		2AU270631 LC		2AU270631 LC	
	3	MANUFACTURER OR EQUAL		Masonellan							
	4	SERIES OR MODEL NO.		11							
BODY	5	SIZE: BODY/TRIM		1/2" Cv=2		1/2" Cv=2		1/2" Cv=2		1/2" Cv=2	
	6	TYPE: GLOBE/ANGLE/OTHER		<input checked="" type="checkbox"/> REGULATOR		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	7	GUIDING: CAGE/STEM/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	7A	SEATS: SINGLE/DOUBLE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8	CONN. RATING: • ANSI RF/NPT/		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	8A	• ANSI RF/ • RTJ/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	9	BODY MAT'L C.S./ S.S./OTHER		<input type="checkbox"/> BRONZE		<input type="checkbox"/> BRONZE		<input type="checkbox"/> BRONZE		<input type="checkbox"/> BRONZE	
	10	PACKING: TEF. ASB./GRAPHITE/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	11	LUBRICATOR/ISO. VALVE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	12	BONNET: PLAIN/NORMALIZING/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	13	TRIM FORM: %/LINEAR/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	13A	TRIM TYPE: BALANCED/UNBALANCED		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	14	TRIM MAT'L: 4/6 S.S./STEL./OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	15	REQUIRED SEAT TIGHTNESS. ANSI CL.		IV		IV		IV		IV	
	16	MAX dBA: 90dB/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	ACTUATOR	17	TYPE: SPRING & DIAP./SPRINGLESS		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
18		DOUBLE-ACTING PISTON/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
19		Δ P FOR SIZING PURPOSES									
20		FLOW: OPENS/CLOSES		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
21		FAILS: OPEN/CLOSED/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
22		HANDWHEEL - LOCATION		TOP							
POSITIONER	23	TYPE: PNEUMATIC/ELECTRO.PNEUM.		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	24	FILT. REG./GAGES/BYPASS		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	25	INPUT: 3-15 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	26	OUTPUT: DIRECT/REVERSE		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
	27	SUPPLY PRESSURE: 40 PSIG/OTHER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
OPTIONS	28	Sol. Vlv. Details on pg.									
	29	Tag Number									
	30	Type Number									
	31	GAUGES INLET & OUTLET PRES		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	32										
SERVICE	34	FLOW UNITS									
	35	FLUID		PLANT AIR		PLANT AIR		PLANT AIR		PLANT AIR	
	36	QUANT. MAX. <sup>1/2</sup> CV		29 .11		29 .11		44.3 .17		44.3 .17	
	37	QUANT. OPER. <sup>1/2</sup> CV		20 .08		20 .08		31 .12		31 .12	
	38	VALVE CV		2		2					
	39	P. NORM.	Δ P NORM.	114	75	114	75	114	70	114	70
	40	P. MAX.	Δ P MAX.								
	41										
	42	TEMP. MAX.	TEMP. OPER.		100		100		100		100
	43	OPER. SPGR.	M.W.		28.4		28.4		29		29
44	OPER. VISC.	% FLASHING	.02		.02		.02		.02		
45	° SUPERHEAT	% SOLIDS									
46	VAPOR PRESS.	CRIT. PRESS.									
BY		WWA		P. O. NO.		VENDOR					

FORM NO. 135-626A



# REQUISITION

SECTION 2700  
WASTEWATER TREATMENT

## FOSTER WHEELER ENERGY CORPORATION

PAGE 1 OF 2

CLIENT	CONOCO/DOE	CONTRACT NO.	15-1910	REQUISITION NO.		DATE	
SITE	Noble County, Ohio	ITEM NO.		27-1910-1639-A		8 Dec 80	
MATERIAL	PRESSURE SAFETY VALVES (MISC)			C1	6 MAR 81	C4	
				C2		C5	
DOCUMENTATION REQUIREMENTS				C3		C6	

- I. THE VENDOR SHALL FURNISH THE FOLLOWING CERTIFIED DATA FOR ALL ITEMS ON THIS REQUISITION IN THE QUANTITIES AND WITHIN THE TIME SCHEDULES LISTED BELOW (TIMES ARE "WEEKS AFTER RECEIPT OF PURCHASE ORDER"):

TYPE OF DATA	REPRODUCIBLE <sup>1</sup>	COPIES <sup>2</sup>	WEEKS A.R.O.	REMARKS
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C. PIPING DIAGRAMS				
D. CALCULATION OR CALIBRATION				
E. DATA BOOK MATERIAL <sup>3</sup>				

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 FWEC P.O. NO.

FOR: CONOCO/DOE  
 Pipeline Gas Demonstration Plant  
 Noble County, Ohio

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 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NJ 07039  
 ATTENTION: VENDOR PRINT CONTROL, INST. GROUP  
 DEPT. 135

1. IN 8 1/2 x 11 SIZE, CLEAN LINE OPAQUE PRINTS SUITABLE FOR "XEROX" REPRODUCTION ARE ACCEPTABLE. REPRODUCIBLES SHALL NOT BE FOLDED.
2. ALL PRINTS MUST BE FOLDED TO A SIZE OF 8 1/2 x 11.
3. THIS DATA IS REQUIRED NO LATER THAN TIME OF SHIPMENT OF THE EQUIPMENT. IN ADDITION, ONE COPY OF INSTRUCTION IS TO BE INCLUDED WITH THE UNIT SHIPPED.

### GENERAL NOTES

- I. GENERAL NOTES REQUISITION 1910 -1600A IS PART OF THIS REQUISITION.
- II. WHEN THE REQUISITION IS A REVISED ISSUE, CHANGES ARE INDICATED BY A NUMBER INSIDE A TRIANGLE:

FORM NO. 135-689A



# REQUISITION

## FOSTER WHEELER ENERGY CORPORATION PAGE 2 OF

CLIENT		CONOCO/DOE		CONTRACT NO. 15-1910		REQUISITION NO.		DATE	
SITE		NOBLE COUNTY, OHIO		ITEM NO.		27-1910-1639-A		8 Dec 80	
MATERIAL		PRESSURE SAFETY VALVES (misc)		C1		6 MAR 81		C4	
				C2				C5	
SERVICE				C3				C6	
GENERAL	1	TAG NO./QUANTITY		PSY-2720   1	PSY-2799   1				
	2	SERVICE		BREATHER VALVE	BREATHER VALVE				
	3	LINE NO. OR VESSEL NO.		TK-2702	TK-2701				
	4	MANUFACTURER OR EQUAL		VARIC	VARIC				
	5	SERIES OR MODEL NO.		2010-61	2010-61				
	6								
	7								
Conn.	8	Size		2"	2"				
	9	Connection		150# RF	150# RF				
	10	Type of Vent		To Atmos	To Atmos				
	11								
Valve Body	12	Body		ALUMINUM					
	13	Hood		ALUMINUM					
	14	Screen		GALV. STEEL					
	15	Pallet Assbly: Press		ALUMINUM					
	16	Vac.		ALUMINUM					
	17								
	18	Seats:		TFE COATED AL.					
	19								
	20	Guide Posts:		304SS					
	21								
22									
23	Rated Press								
Service Conditions	24	Fluid & State		OIL/WATER-FIRE	OIL/WATER-FIRE				
	25	Required Cap. FREE AIR EQUIV.		3600 CFH	3600 CFH				
	26	Mol. Wt./Sp. Gr.		29	29				
	27	Press: Press. Relief Set		6" WC	6" WC				
	28	Vac. Set		6" WC	6" WC				
	29	Oper. Press.		ATMOS	ATMOS				
	30	COMPRESSIBILITY FACTOR		1.0	1.0				
	31	Temp: Operating		200°F	200°F				
	32	Ambient Temp. Range							
	33	RELIEVING		210°F	210°F				
	34	Atmospheric Press @ Loc.		14.2 psig	14.2 psig				
	35	Vessel Design Press		6" WC	6" WC				
	36								
	37								
38									
39									
40									
41									
42									
43									
44									
45									
46									
NOTES:									
BY <u>WVA</u>				P. O. NO.		VENDOR			

FORM NO. 135-628

18.10 LINE LISTS



FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION				CONTRACT: 15-1910		LINE CLASSIFICATION LIST				FLOW SHEET NUMBER & REVISION 1910-1-50-27001 D			PAGE 1 OF 8		
REVISION		ORIGINAL	1	2	3	4	5	6	7	8	9	10	11		
DATE		19 SEP 80	5 DEC 80	6 FEB 81											
LINE NUMBER			LINE EXTREMITIES			OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS
SIZE	SERIAL*	SPEC	FROM	TO	TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK					
16"	DO 0101	M	B.L. 3200	S-2701 1/8	AMB	ATM	100	ATM	NI	-					UG DELETED
	0102														
3"	CWR 0103	Lc	P-2715 A/B	B.L. 3200	AMB	55	165	100	ST	1/2					
2"	C 0104	As	B.L. 3200	D-2702	100	30	100	70	ET	1/2					
1 1/2"	C 0105	AK2	B.L. 3200	D-2701	100	30	100	90	ET	1/2					
4"	WW 0106	Ad	B.L. 3200	A-2707	100	30	200	100	NI	-					
1 1/2"	C 0107	As	D-2702	P-2710 1/8, P-2733	100	ATM	100	16	ET	1/2					
1/2 1"	C 0108	As	P-2710 1/8	A-2707	100	14	100	100	ET	1/2					
1 1/2"	C 0109	AK2	D-2701	P-2709 1/8	100	ATM	100	16	ET	1/2					
1/2 1"	C 0110	AK2	P-2709 1/8	A-2707	100	10	100	100	ET	1/2					
	0111														DELETED
3"	P 0112	Lc	S-2701	P-2705 1/8 Sump	AMB	ATM	100	3	NI	-					
2"	C 0113	As	D-2702	LIMESTONE PIT	100	ATM	100	ATM	NI	-					
6"	WW 0114	M	B.L. 3200	A-2707	AMB	ATM	AMB	ATM	NI	-					
4"	WW 0115	M	S-2701	A-2707	AMB	ATM	100	ATM	NI	-					UG DELETED
	0116														
4"	WW 0117	Lc	P-2701 1/8	S-2702 A	95	25	100	35	ST/NI	1 1/2					DELETED
	0118														
1"	SL 0119	AF	15	D-2702	310	40	390	65	HC	2					
1"	CL 0120	AF	D-2702	15	287	40	390	65	PP	1/2					
1"	SL 0121	AF	15	D-2701	310	40	390	65	HC	2					
1"	CL 0122	AF	D-2701	15	287	40	390	65	PP	1/2					
2"	C 0123	AK2	D-2701	15	AMB	ATM	AMB	ATM	NI	-					
2"	DSC 0124	Lc	DSC 2704 11	TK-2720	AMB	30	100	40	ST	1/2					
3/4"	C 0125	As	P-2733	TK-2722	AMB	10	100	100	ET	1/2					
	0126														DELETED
3"	DM 0127	Lc	S-2701	HOSE CONN.	AMB	ATM	AMB	ATM	NI	-					
4"	DO 0128	M	B.L. 3000	DO 2701 01	AMB	ATM	100	ATM	NI	-					

335

⑤ ← SEE NOTES—LINE CLASSIFICATION LIST INDEX → ① ① ① ① ② ③ ④

\* ALL SERIAL NUMBERS PRECEDED BY "27", e.g. 2" CWR 270103.

FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION			CONTRACT: 15-1910 SECTION: 2700		LINE CLASSIFICATION LIST				FLOW SHEET NUMBER & REVISION 1910-1-50-27002 D			PAGE 2 OF 8		
REVISION	ORIGINAL	1	2	3	4	5	6	7	8	9	10	11		
DATE	19 SEP 80	5 DEC. 80	6 FEB 81											
LINE NUMBER		LINE EXTREMITIES		OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS	
SIZE	SERIAL*	SPEC	FROM	TO	TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK				
4"	NW0201	Lc	WW270117	S-2702B	95	25	100	35	NI	-				
4 1/6"	NW0202	Lc	S-2702A	A-2711	95	ATM	100	ATM	NI	-				
4"	WW0203	Lc	S-2702B	WW270207	95	ATM	100	ATM	NI	-				
2"	WW0204	Lc	S-2702A	P-2720 1/8 SUMP	95	ATM	100	ATM	NI	-				
2"	WW0205	Lc	S-2702B	WW270204	95	ATM	100	ATM	NI	-				
1 1/2"	WW0206	Lc	P-2720 1/8 B	CL-2703	95	15	100	40	ST	1 1/2				
4"	DM0207	M	S-2702A	P-2727 1/8 SUMP	AMB	ATM	100	ATM	NI	-			U. G.	
1"	C0208	A	A-2717	WW270117	AMB	50	100	100	ET	1 1/2				
1"	C0209	A	A-2717	WW270201	AMB	50	100	100	ET	1 1/2				
1"	WU0210	Lc	16	A-2717	70	75	100	95	NI	-				
2"	AU0211	Lc	18	S-2702 1/8 B	100	100	150	140	NI	-				
1"	WU0212	Lc	16	A-2723	70	75	100	95	ET	1 1/2				
2"	C0213	A	A-2723	A-2711	AMB	75	100	95	NI	-				
1 1/2"	C0214	Rh1	B.L. 3200	D-2703	AMB	36	100	50	NI	-				
1 1/2"	C0215	Rh1	D-2703	P-2719 1/8 B	AMB	ATM	100	16	NI	-				
1 1/2"	C0216	Rh1	P-2719 1/8 B	A-2711	AMB	10	100	100	NI	-				
1 1/2"	SL0217	Af	15	P-2720 SUMP	310	40	390	65	HC	1 1/2				
1"	CL0218	Af	P-2720 SUMP	51	287	40	390	65	PP	1 1/2				
4 1/3"	AP0219	Lc	B-2704	M-2701	AMB	10	150		NI	-				
3 1/2"	AP0220	Lc	B-2705	M-2702	AMB	10	150		NI	-				
6"	WW0221	Lc	A-2711	CL-2702	95	ATM	100	ATM	NI	-				
6"	WW0222	Lc	CL-2702	P-2712 1/8 SUMP	95	ATM	100	4	NI	-				
4"	DM0223	Lc	CL-2702	P-2711 A/B	95	ATM	100	ATM	NI	-				
3"	DM0224	Lc	P-2711 1/8 B	A-2711	95	10	100	30	ST	1 1/2				
2"	DM0225	Lc	DM270224	TK-2718	95	10	100	30	ST	1 1/2				
1"	AU0226	Lc	18	WU270212	100	100	150	140	NI	-				
	0227												DELETED	
	0228												DELETED	
6 1/4"	AP0229	Lc	B-2706	M-2703	AMB	10	150		NI	-				
2"	C0230	Rh1	D-2703	51	AMB	ATM	AMB	ATM	NI	-				
4"	DM0231	M	S-2702B	DM270207	AMB	ATM	100	ATM	NI	-			U.G.	
3/4"	WU0232	Lc	WU270212	51	70	ATM	100	95	NI	-				

336

(5) ← SEE NOTES—LINE CLASSIFICATION LIST INDEX → (1) (1) (1) (1) (2) (3) (4)

\* SEE NOTE PAGE 1.



FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION			CONTRACT: 15-1910				LINE CLASSIFICATION LIST				FLOW SHEET NUMBER & REVISION				PAGE 3 OF 8	
SECTION:											1910-1-50-27003 D					
REVISION		ORIGINAL	1	2	3	4	5	6	7	8	9	10	11			
DATE		19 SEP 80	5 DEC 80	6 FEB 81												
LINE NUMBER			LINE EXTREMITIES			OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS	
SIZE	SERIAL #	SPEC	FROM	TO	TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK						
4"	WW0301	Lc	P-2712A/B	M-2704	95	45	100	60	ST/NI	1/2						
4"	WW0302	Lc	M-2704	A-2720A/B	95	45	100	60	NI	-						
	0303													DELETED		
1"	WU0304	Lc	16	A-2719	70	75	100	95	NI	-						
1"	C0305	A	A-2719	WW270301	95	30	100	95	NI	-						
6"	WW0306	Lc	A-2720A	P-2725 1/2 SUMP	95	0	100	3	NI	-						
6"	WW0307	Lc	A-2720B	WW270306	95	0	100	3	NI	-						
10"	WW0308	Lc	A-2720A	P-2726 1/2 SUMP	95	0	100	3	NI	-						
2"	WW0309	Lc	P-2726A/B	A-2707	95	20	100	30	NI/ST	-1/2						
4"	WW0310	Lc/M	WW270301	A-2711	95	45	100	60	NI	-				A.G./U.G.		
4"	WW0311	Lc	P-2725A/B	A-2705	95	35	100	45	NI	-						
3"	WW0312	Lc	TK-2718	TK-2719	95	ATM	100	ATM	NI	-						
3"	WW0313	Lc	TK-2719	A-2711	95	ATM	100	ATM	NI	-						
3"	DM0314	Lc	TK-2719	P-2704A/B/C	95	0	100	8	ST	1/2						
2"	DM0315	Lc	P-2704A/B	TK-2718	95	15	100		ST	1/2						
2"	DM0316	Lc	P-2704B/C	TK-2717	95	15	100		ST	1/2						
	0317													DELETED		
2"	AU0318	Lc	18	P-2704A/B/C	100	100	150	140	NI	-						
	0319													DELETED		
2"	DM0320	Lc	DM270225	DM270316	95	15	100		ST	1/2						
2"	DM0321	Lc/M	DM270315	A-2711	95	15	100		NI	-				A.G./U.G.		
3"	DM0322	Lc	TK-2719	51	95	ATM	100	8	NI	-						
2"	AU0323	Lc	18	A-2720A/B	100	100	150	140	NI	-						
4"	WW0324	Lc	WW270301	WW270302	95	45	100	60	NI	-						
10"	WW0325	Lc	A-2720B	WW270308	95	0	100	3	NI	-						
2"	DM0326	Lc	DM270413	DM270320	95	15	100		ST	1/2						
2"	SL0327	Af	15	TK-2718	310	40	390	65	HC	1/2						
2"	CL0328	Af	TK-2718	51	287	40	390	65	PP	1/2						

337

(5) ← SEE NOTES—LINE CLASSIFICATION LIST INDEX → (1) (1) (1) (1) (2) (3) (4)

\* SEE NOTE PAGE 1.

FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION			CONTRACT: 15-1910		LINE CLASSIFICATION LIST				FLOW SHEET NUMBER & REVISION			PAGE 4 OF 8		
SECTION: 2700									1910-1-50-27004 D					
REVISION	ORIGINAL	1	2	3	4	5	6	7	8	9	10	11		
DATE	19 SEP 80	5 DEC 80	6 FEB 80											
LINE NUMBER			LINE EXTREMITIES		OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS
SIZE	SERIAL*	SPEC	FROM	TO	TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK				
8"	WW0401	Lc	A-2705	A-2707	100	ATM	100	ATM	NI/ST	-1/2				
2"	WU0402	Lc	116	A-2705	70	75	100	95	ET	1/2				
3"	DO0403	Lc	A-2705	151	AMB	ATM	100	ATM	NI	-				
4"	WW0404	Lc	A-2705	TK-2722	95	20	100	60	NI	-				
4"	WW0405	Lc/M	WW270404	A-2721	95	20	100	60	NI	-				A.G. / U.G.
48"	DSC0406	M	B.L.	A-2708	AMB	ATM	100	ATM	NI	-				U.G.
1 1/2"	P0407	Lc/M	A-2715	P-2705A/B	AMB	ATM	100	ATM	NI	-				A.G. / U.G.
4"	DSC0408	M	A-2708	P-2729A SUMP	AMB	ATM	100	ATM	NI	-				U.G.
4"	DSC0409	M	A-2721	P-2729B SUMP	AMB	ATM	100	ATM	NI	-				U.G.
	0410													DELETED
2"	DSC0411	Lc	P-2729A/B SUMP	A-2707	AMB	30	100	36	ST	1/2				
8"	DY0412	Mb	B.L.	A-2702	AMB	ATM	100	ATM	NI	-				
2"	DM0413	Lc	A-2702	TK-2718	AMB	ATM	100	ATM	ST	1/2				
4"	DY0414	Mb	A-2702	P-2731A SUMP	AMB	ATM	100	ATM	NI	-				
2"	WU0415	Lc	116	A-2702	70	75	100	95	ET	1/2				
1 1/2"	DY0416	Lc	P-2731A/B	WW270504	AMB	82	100	100	ST	1/2				
2"	AU0417	Lc	118	A-2702	100	100	150	140	NI	-				
2"	V0418	Lc	A-2702	135	100	ATM	100	ATM	NI	-				
1 1/2"	DY0419	Lc	DY270416	A-2711	AMB	82	100	100	NI	-				
8"	WW0420	Lc	A-2705	WW270401	100	ATM	100	ATM	NI	-				
3"	DO0421	Lc	A-2705	DO270403	AMB	ATM	100	ATM	NI	-				

338

(5) ← SEE NOTES—LINE CLASSIFICATION LIST INDEX →

(1) (1) (1) (1) (2) (3) (4)

\* SEE NOTE PAGE 1

FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION			CONTRACT: 15-1910		LINE CLASSIFICATION LIST			FLOW SHEET NUMBER & REVISION			PAGE 5 OF 8			
SECTION: 2700								1910-1-50-27005			D			
REVISION	ORIGINAL	1	2	3	4	5	6	7	8	9	10	11		
DATE	19 SEP 80	5 DEC 80	6 FEB 81											
LINE NUMBER		LINE EXTREMITIES			OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS
SIZE	SERIAL*	SPEC	FROM	TO	TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK				
6"	WW0501	Lc	B.L. 3200	TK-2722	AMB	60	100	85	ST	1 1/2				
4"	WW0502	Lc	A-2722	TK-2720	115		100		NI	-				
6"	WW0503	Lc	TK-2720	P-2724 1/8	100	0	100	10	NI/ST	-1 1/2				
6"	WW0504	Lc	P-2724 1/8	B.L. 3200	100	75	100	90	ST/NI	1 1/2				
2"	DM0505	MF	A-2722	P-2730 1/8	214	ATM	214	3	PP	1 1/2				
2"	DM0506	MF	P-2730 1/8	B.L. 3200	214	40	214	48	ET	1 1/2				
12"	WW0507	Lc	TK-2720	P-2713 1/8	100	ATM	100	10	ST	2				
8"	WW0508	Lc	P-2713 1/8	A-2705	100	53	100	64	ST/NI	1 1/2				
	0509													DELETED
2"	WW0510	Lc	16	A-2722	70	75	100	95	NI	-				
3"	SL0511	AF	15	A-2722	310	40	390	65	HC	2 1/2				
2"	V0512	Lc	A-2722	35	AMB	ATM	100	ATM	NI	-				
4"	WW0513	Lc	TK-2720	51	AMB	ATM	100	ATM	NI	-				
	0514													DELETED
4"	WW0515	Lc	A-2722	WW270404	115		100		ST	1 1/2				
8"	WW0516	Lc	WW270508	A-2705	AMB	53	100	64	NI	-				
6"	WW0517	Lc	TK-2722	P-2734 1/8	AMB	ATM	100	ATM	NI/ST	-1 1/2				
4"	WW0518	Lc	P-2734 1/8	A-2722	AMB	40	100	48	ST/NI	1 1/2				
2"	DM0519	MF	A-2722	51	214	ATM	214	ATM	NI	-				
3"	WW0520	Lc	TK-2720	WW270513	AMB	ATM	AMB	ATM	NI	-				
2"	WW0521	Lc	A-2722	51	AMB	ATM	AMB	ATM	NI	-				
3"	WW0522	Lc	TK-2722	WW270523	AMB	ATM	AMB	ATM	NI	-				
4"	WW0523	Lc	TK-2722	51	AMB	ATM	AMB	ATM	NI	-				

339

(5) ← SEE NOTES—LINE CLASSIFICATION LIST INDEX →

(1) (1) (1) (1) (2) (3) (4)

\* SEE NOTE PAGE 1.

FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION			CONTRACT: 15-1910		LINE CLASSIFICATION LIST				FLOW SHEET NUMBER & REVISION			PAGE 6 OF 8	
SECTION: 2700			1910-1-50-27006		D								
REVISION	ORIGINAL	1	2	3	4	5	6	7	8	9	10	11	
DATE	19 SEP 80	5 DEC 80	6 FEB 80										
LINE NUMBER		LINE EXTREMITIES		OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS
SIZE	SERIAL*	SPEC	FROM	TO	TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK			
3"	WW 0601	Lc	CL-2703	S-2701	95	ATM	100	ATM	ST	1 1/2			
3"	DM 0602	Lc	CL-2703	P-2727 A/B	95	0	100	2	NI	-			
	0603												DELETED
	0604												DELETED
2"	DM 0605	Lc	P-2727 A/B	TK-2717	95	15	100	20	ST	1 1/2			
3"	WW 0606	Lc	TK-2717	51	95	ATM	100	ATM	NI	-			
3"	DM 0607	Lc	TK-2717	P-2728 A/B	95	1	100	7	ST	1 1/2			
2"	DM 0608	Lc	P-2728 A/B	A-2706	95	20	100	50	ST/NI	1 1/2			
2"	DM 0609	Lc	DM270608	TK-2717	95	20	100	50	ST	1 1/2			
1 1/2"	SL 0610	Af	15	TK-2717	310	40	390	65	HC	2			
1"	CL 0611	Af	TK-2717	51	287	40	390	65	PP	1 1/2			
1"	WU 0612	Lc	16	A-2716	70	75	100	95	NI	-			
1"	C 0613	A	A-2716	A-2706	AMB	10	100	100	NI	-			
2"	WU 0614	Lc	16	A-2706	70	75	100	95	NI	-			
4"	P 0615	A	P-2705 A/B	DO270618	AMB	40	180	48	ST	1 1/2			
2"	SL 0616	Af	15	TK-2701	310	40	390	65	HC	2			
2"	CL 0617	Af	TK-2701	51	287	40	390	65	PP	1 1/2			
4"	DO 0618	A	TK-2701	S-2701	AMB	ATM	180	ATM	NI	-			GRAVITY FLOW
4"	DO 0619	A/M	TK-2701	P-2705 A/B SUMP	AMB	ATM	180	ATM	NI	-			DELETED
	0620												
4"	P 0621	A	P270615	P-2705 A/B SUMP	AMB	40	180	48	NI	-			
3"	P 0622	A	P270615	B.L. 3200	180	40	180	48	ST	1 1/2			
1 1/2"	SL 0623	Af	15	P-2727 A/B SUMP	310	40	390	65	HC	1 1/2			
1"	CL 0624	Af	P-2727 A/B SUMP	51	287	40	390	65	PP	1 1/2			
1 1/2"	SL 0625	Af	15	P-2705 A/B SUMP	310	40	390	65	HC	1 1/2			
1"	CL 0626	Af	P-2705 A/B SUMP	51	287	40	390	65	PP	1 1/2			
2 1/2"	N 0627	A	36	TK-2701	85	55	150	80	NI	-			
2"	V 0628	A	TK-2701	B.L. 3200	85	1/2 H <sub>2</sub> O	320	F <sub>v</sub> /16	NI	-			
4"	WW 0629	Lc	TK-2717	WW 270606	95	ATM	100	ATM	NI	-			
4"	WW 0630	Lc	DM 270602	51	95	ATM	100	ATM	NI	-			
2"	AU 0631	Lc	18	P-2728 A/B	100	100	150	140	NI	-			
2"	SL 0632	Af	15	TK-2702	310	40	390	65	HC	2			
2"	CL 0633	Af	TK-2702	51	287	40	390	65	PP	1 1/2			
4"	DO 0634	A	TK-2702	P-2705 A/B SUMP	AMB	ATM	180	ATM	NI	-			
4"	DO 0635	A	TK-2702	DO270618	AMB	ATM	180	ATM	NI	-			

(5) ← SEE NOTES—LINE CLASSIFICATION LIST INDEX → (1) (1) (1) (1) (2) (3) (4)

\* SEE NOTE PAGE 1.

340



FOSTER WHEELER ENERGY CORP. PROCESS PLANTS DIVISION			CONTRACT: 15-1910		LINE CLASSIFICATION LIST					FLOW SHEET NUMBER & REVISION		PAGE 7 OF 8														
SECTION: 2700			DATE		1		2		3		4		5		6		7		8		9		10		11	
REVISION			ORIGINAL		1		2		3		4		5		6		7		8		9		10		11	
DATE			19 SEP 80		5 DEC 80		6 FEB 81																			
LINE NUMBER			LINE EXTREMITIES				OPERATING		DESIGN		INSULATION		PLAN OR ISOMETRIC DRAWING NO.	PIPE WALL THK	FLU. CAT.	REMARKS										
SIZE	SERIAL*	SPEC	FROM	TO		TEMP °F.	PRESS PSIG	TEMP °F.	PRESS PSIG	TYPE	THK															
3"	SL 0701	AF	B.L. 3200	15	HEADER	310	45	390	65	HC	2 1/2"															
2"	SL 0702	AF	SL 270701	15	SUBHEADER	310	45	390	65	HC	2 1/2"															
3"	SL 0703	AF	SL 270701	15	SUBHEADER	310	45	390	65	HC	2 1/2"															
3"	SL 0704	AF	SL 270701	15	SUBHEADER	310	45	390	65	HC	2 1/2"															
2"	SM 0705	AF	SM 270731	14	HEADER	490	125	550	155	HC	2 1/2"															
	0706														DELETED											
3"	WU 0707	LC	WU 270729	16	HEADER	AMB	75	100	95	ET	1 1/2"															
2"	WU 0708	LC	WU 270707	16	SUBHEADER	AMB	75	100	95	ET	1 1/2"															
2"	WU 0709	LC	WU 270707	16	SUBHEADER	AMB	75	100	95	ET	1 1/2"															
3"	WU 0710	LC	WU 270707	16	SUBHEADER	AMB	75	100	95	ET/NI	1 1/2"															
2"	AI 0711	L1	AI 270733	19	HEADER	100	100	150	140	NI	-															
2"	AU 0712	LC	AU 270732	18	HEADER	100	100	150	140	NI	-															
2"	AU 0713	LC	AU 270712	18	SUBHEADER	100	100	150	140	NI	-															
2"	AI 0714	L1	AI 270711	19	SUBHEADER	100	100	150	140	NI	-															
2"	AU 0715	LC	AU 270712	18	SUBHEADER	100	100	150	140	NI	-															
2"	AI 0716	L1	AI 270711	19	SUBHEADER	100	100	150	140	NI	-															
2"	AI 0717	L1	AI 270711	19	SUBHEADER	100	100	150	140	NI	-															
2"	AU 0718	LC	AU 270712	18	SUBHEADER	100	100	150	140	NI	-															
6"	WW 0719	M	51   HEADER		A-2707	AMB	ATM	AMB	ATM	NI	-				U/G DELETED											
	0720																									
6"	WW 0721	M	51   SUBHEADER		WW 270719	AMB	ATM	AMB	ATM	NI	-				U/G											
4"	WW 0722	M	51   SUBHEADER		WW 270719	AMB	ATM	AMB	ATM	NI	-				U/G											
2"	AI 0723	L1	AI 270717	19	SUBHEADER	100	100	150	140	NI	-															
2"	AU 0724	LC	AU 270718	18	SUBHEADER	100	100	150	140	NI	-															
3"	SL 0725	AF	SL 270704	15	SUBHEADER	310	45	390	65	HC	2 1/2"															
3"	WU 0726	LC	WU 270710	16	SUBHEADER	AMB	75	100	95	NI	-															
3"	WU 0727	LC	WU 270710	16	SUBHEADER	AMB	75	100	95	ET	1 1/2"															
2"	SL 0728	AF	SL 270703	15	SUBHEADER	310	45	390	65	HC	2 1/2"															
3 1/4"	WW 0729	LC	B.L. 3200		B.L. 3000	AMB	75	100	95	ET	1 1/2"															
2 1/2"	N 0730	A	B.L. 3200		B.L. 3000	85	55	150	80	NI	-															
6"	SM 0731	AF	B.L. 3200		B.L. 3000	490	125	550	155	HC	3"															
2 1/4"	AU 0732	LC	B.L. 3200		B.L. 3000	100	100	150	140	NI	-															
2 1/2"	AI 0733	L1	B.L. 3200		B.L. 3000	100	100	150	140	NI	-															
3"	DO 0734	AD	B.L. 3000		B.L. 3200	85	50	150	70	ST	1 1/2"															
1 1/2"	FG 0735	AK	B.L. 3200		B.L. 3000	100	50	150	60	NI	-															

⑤ ← SEE NOTES—LINE CLASSIFICATION LIST INDEX →

(1) (1) (1) (1) (2) (3) (4)

342

\* SEE NOTE PAGE 1.

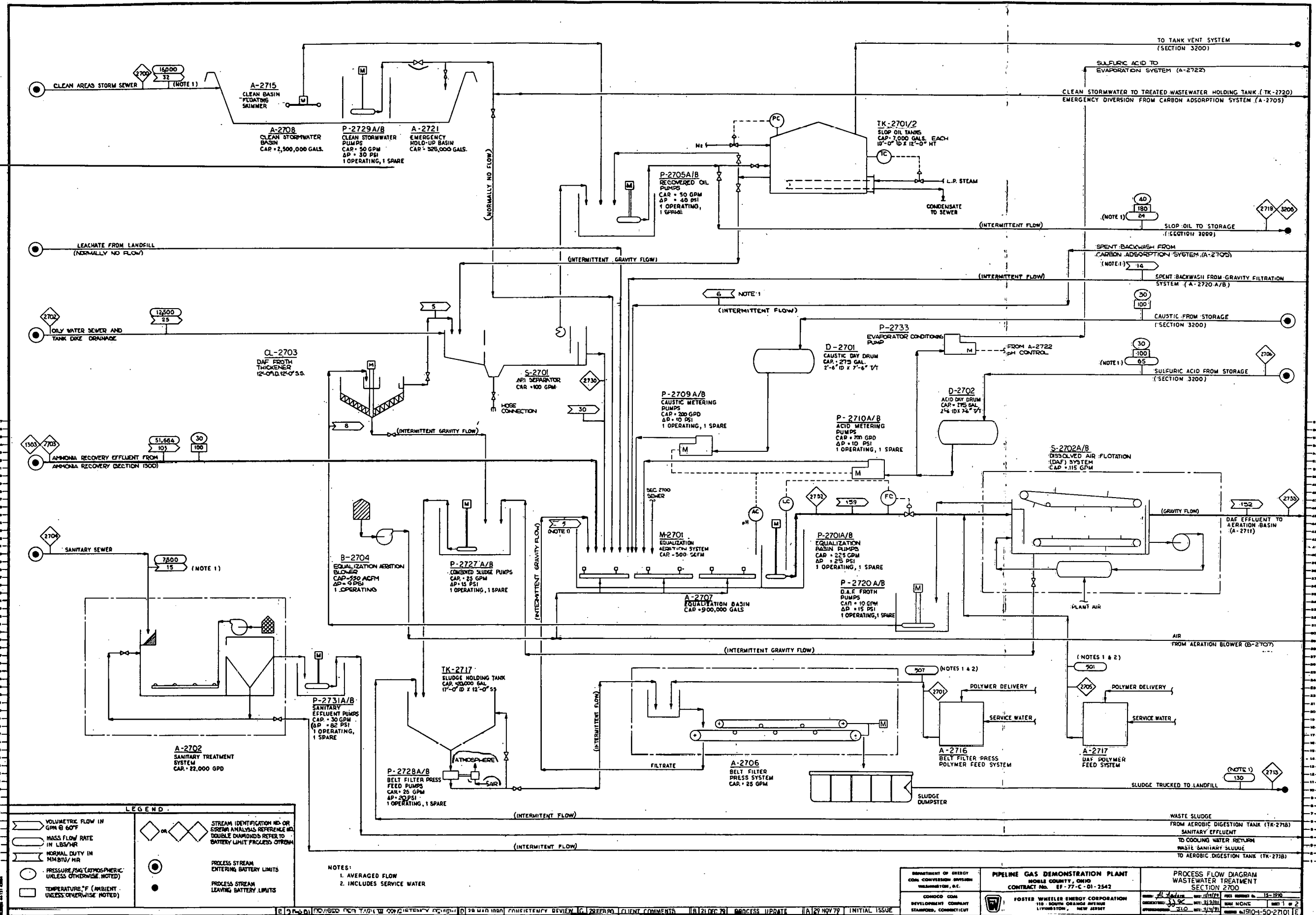


## 18.11 PROCESS FLOW DIAGRAMS

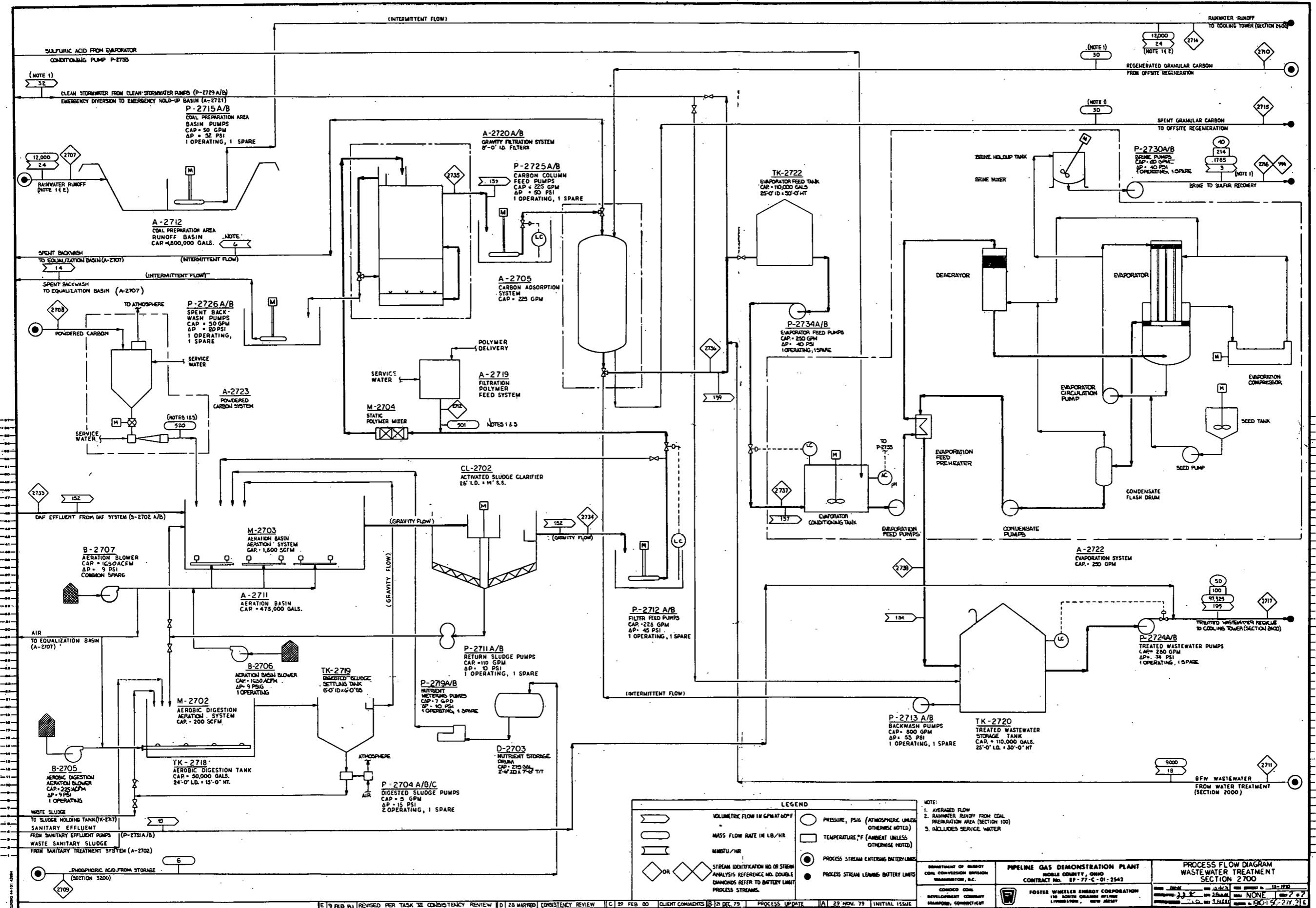
The following Process Flow Diagrams are included in this section:

<u>Drawing NO.</u>	<u>Title</u>
1910-1-50-27101	Wastewater Treatment - Section 2700
1910-1-50-27102	Wastewater Treatment - Section 2700





DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C. CONCEPT DESIGN DEVELOPMENT COMPANY STAMFORD, CONNECTICUT	<b>PIPELINE GAS DEMONSTRATION PLANT</b> MOBILE COUNTY, OHIO CONTRACT NO. EF-77-C-01-2542 FOSTER WHEELER ENERGY CORPORATION 115 NORTH ORANGE AVENUE LIVINGSTON, NEW JERSEY	<b>PROCESS FLOW DIAGRAM</b> WASTEWATER TREATMENT SECTION 2700 SHEET NO. 15-1720 SHEET NO. 15-1720 SHEET NO. 15-1720 SHEET NO. 15-1720
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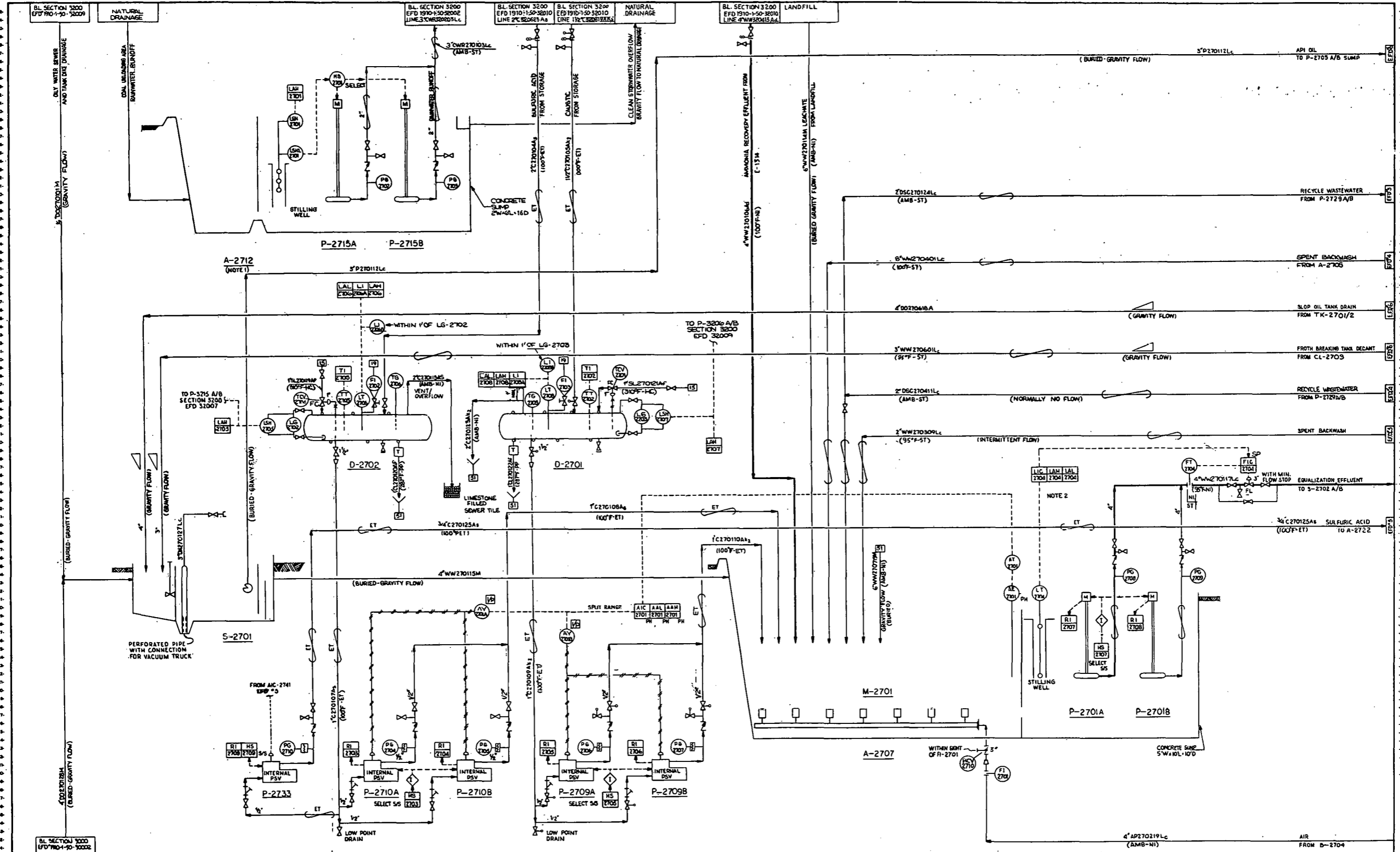
E 9 FEB 81 | REVISED PER TASK III CONSISTENCY REVIEW | D 28 MAR 81 | CONSISTENCY REVIEW | C 29 FEB 80 | CLIENT COMMENTS | B 21 DEC 79 | PROCESS UPDATE | A 29 NOV 79 | INITIAL ISSUE

DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C.	<b>PIPELINE GAS DEMONSTRATION PLANT</b> MOBILE COUNTY, OHIO CONTRACT NO. 87-77-C-01:2542	<b>PROCESS FLOW DIAGRAM</b> <b>WASTEWATER TREATMENT</b> <b>SECTION 2700</b>
DRAWING CODE: DEVELOPMENT COMPANY: DRAWING NO.: 2700	FOSTER WHEELER ENERGY CORPORATION 110 SOUTH GREENWAY AVENUE LITTLE ROCK, ARIZONA	DATE: 11-11-79 DRAWN BY: J. J. JENSEN CHECKED BY: J. J. JENSEN APPROVED BY: J. J. JENSEN SCALE: AS SHOWN SHEET NO.: 2 OF 2

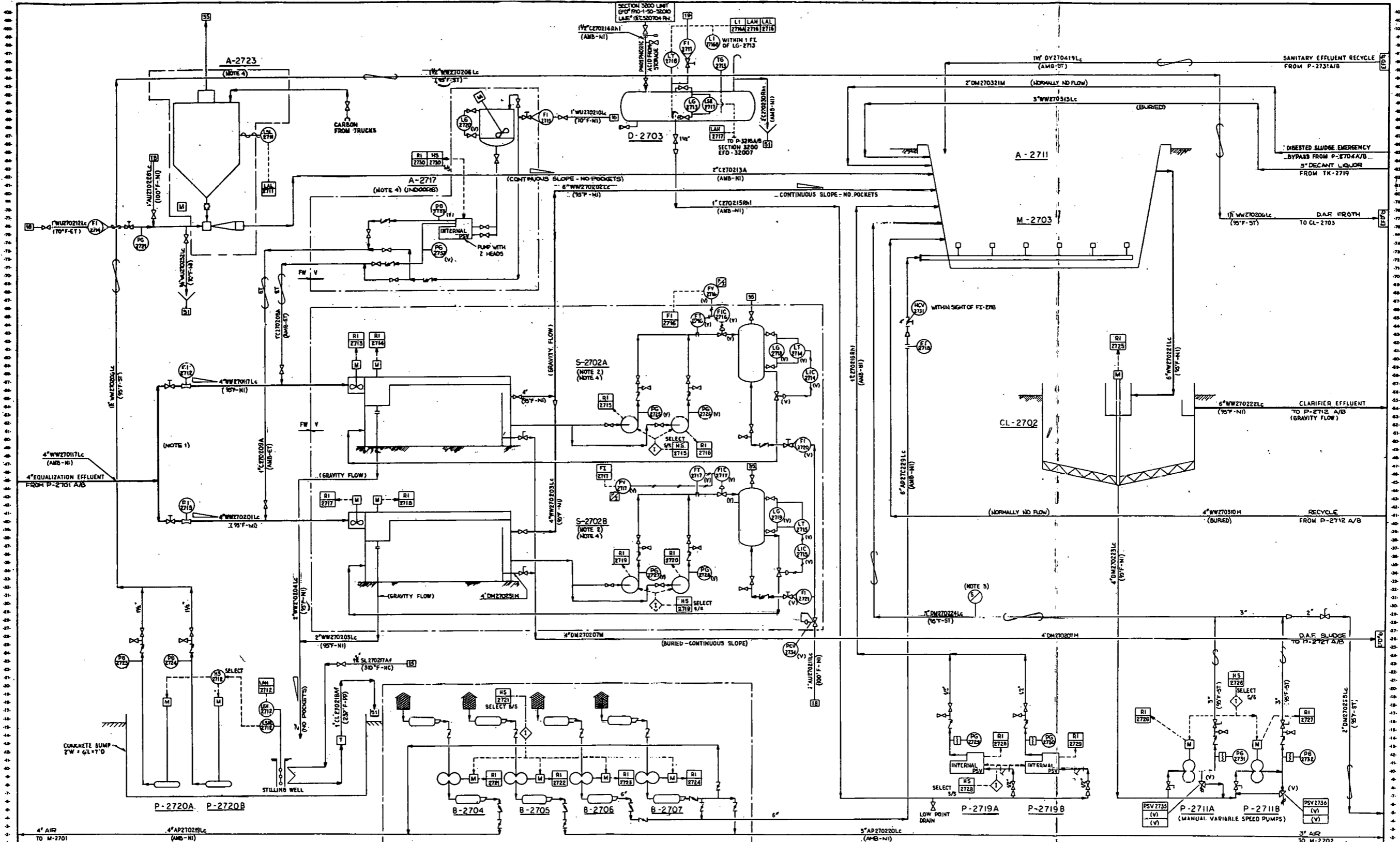
18.12 ENGINEERING FLOW DIAGRAMS (P & ID)

The following Engineering Flow Diagrams (P & ID) are included in this section:

<u>Drawing No.</u>	<u>Title</u>
1910-1-50-27001	Wastewater Equalization
1910-1-50-27002	DAF/Biological Treatment
1910-1-50-27003	Filtration and Digestion System
1910-1-50-27004	Carbon Adsorption & Sanitary System
1910-1-50-27005	Evaporation System
1910-1-50-27006	Sludge Handling & Oil Recovery
1910-1-50-27007	Utility Header Diagram



<b>LEGEND</b> L SERVICE WATER C COOLING WATER SUPPLY E WASTE WATER M MINE WATER D DRAINAGE S STEAM G GAS O OIL A AIR P POTABLE WATER F FUEL GAS R RETURN AIR S SLAG L LIME C CONCRETE S STEEL G GALVANNEAL C CEMENT S SAND G GRAVEL L LUMBER S STEEL G GALVANNEAL C CEMENT S SAND G GRAVEL L LUMBER		<b>ITEM NOS. THIS DWG.</b> A-2707 A-2712 D-2701 D-2702 N-2701 P-2701A/B P-2709A/B P-2710A/B P-2713 S-2701A/B		<b>DEPARTMENT OF ENERGY</b> COAL CONVERSION DIVISION WASHINGTON, D.C. <b>CONOCO COAL</b> DEVELOPMENT COMPANY STAMFORD, CONNECTICUT <b>FOSTER WHEELER ENERGY CORPORATION</b> 110 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY <b>ENGINEERING FLOW DIAGRAM</b> WASTE WATER COALIZATION WASTEWATER TREATMENT SECTION 2700	
<b>REVISIONS</b> 1. RAINWATER RUNOFF COLLECTED FROM COAL PREPARATION AREA (SECTION NO. 100). 2. CONTROL TO BE PROPORTIONAL ONLY. 3. STEAM TRACED IN DOUBLE INSULATED ANNULUS.		DATE: 19 JUN 60 DRAWN BY: [Signature] CHECKED BY: [Signature] APPROVED BY: [Signature]			



ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	COOLING WATER SUPPLY	1	SERVICE WATER	1	L.P. CONDENSATE	1	GILY WATER SEWER
2	COOLING WATER RETURN	2	POTABLE WATER	2	TREATED WATER	2	PROCESS SEWER
3	CONDENSATE RETURN	3	PLANT AIR	3	FUEL GAS	3	PURGE GAS
4	CONDENSATE RETURN	4	INSTRUMENT AIR	4	CLEAN WATER SEWER	4	WASTEWATER
5	CONDENSATE RETURN	5	CONDENSATE	5	WASTEWATER	5	WASTEWATER
6	CONDENSATE RETURN	6	CONDENSATE	6	WASTEWATER	6	WASTEWATER
7	CONDENSATE RETURN	7	CONDENSATE	7	WASTEWATER	7	WASTEWATER
8	CONDENSATE RETURN	8	CONDENSATE	8	WASTEWATER	8	WASTEWATER
9	CONDENSATE RETURN	9	CONDENSATE	9	WASTEWATER	9	WASTEWATER
10	CONDENSATE RETURN	10	CONDENSATE	10	WASTEWATER	10	WASTEWATER
11	CONDENSATE RETURN	11	CONDENSATE	11	WASTEWATER	11	WASTEWATER
12	CONDENSATE RETURN	12	CONDENSATE	12	WASTEWATER	12	WASTEWATER
13	CONDENSATE RETURN	13	CONDENSATE	13	WASTEWATER	13	WASTEWATER
14	CONDENSATE RETURN	14	CONDENSATE	14	WASTEWATER	14	WASTEWATER
15	CONDENSATE RETURN	15	CONDENSATE	15	WASTEWATER	15	WASTEWATER
16	CONDENSATE RETURN	16	CONDENSATE	16	WASTEWATER	16	WASTEWATER
17	CONDENSATE RETURN	17	CONDENSATE	17	WASTEWATER	17	WASTEWATER
18	CONDENSATE RETURN	18	CONDENSATE	18	WASTEWATER	18	WASTEWATER
19	CONDENSATE RETURN	19	CONDENSATE	19	WASTEWATER	19	WASTEWATER
20	CONDENSATE RETURN	20	CONDENSATE	20	WASTEWATER	20	WASTEWATER
21	CONDENSATE RETURN	21	CONDENSATE	21	WASTEWATER	21	WASTEWATER
22	CONDENSATE RETURN	22	CONDENSATE	22	WASTEWATER	22	WASTEWATER
23	CONDENSATE RETURN	23	CONDENSATE	23	WASTEWATER	23	WASTEWATER
24	CONDENSATE RETURN	24	CONDENSATE	24	WASTEWATER	24	WASTEWATER
25	CONDENSATE RETURN	25	CONDENSATE	25	WASTEWATER	25	WASTEWATER
26	CONDENSATE RETURN	26	CONDENSATE	26	WASTEWATER	26	WASTEWATER
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35	CONDENSATE RETURN	35	CONDENSATE	35	WASTEWATER	35	WASTEWATER
36	CONDENSATE RETURN	36	CONDENSATE	36	WASTEWATER	36	WASTEWATER
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38	CONDENSATE RETURN	38	CONDENSATE	38	WASTEWATER	38	WASTEWATER
39	CONDENSATE RETURN	39	CONDENSATE	39	WASTEWATER	39	WASTEWATER
40	CONDENSATE RETURN	40	CONDENSATE	40	WASTEWATER	40	WASTEWATER
41	CONDENSATE RETURN	41	CONDENSATE	41	WASTEWATER	41	WASTEWATER
42	CONDENSATE RETURN	42	CONDENSATE	42	WASTEWATER	42	WASTEWATER
43	CONDENSATE RETURN	43	CONDENSATE	43	WASTEWATER	43	WASTEWATER
44	CONDENSATE RETURN	44	CONDENSATE	44	WASTEWATER	44	WASTEWATER
45	CONDENSATE RETURN	45	CONDENSATE	45	WASTEWATER	45	WASTEWATER
46	CONDENSATE RETURN	46	CONDENSATE	46	WASTEWATER	46	WASTEWATER
47	CONDENSATE RETURN	47	CONDENSATE	47	WASTEWATER	47	WASTEWATER
48	CONDENSATE RETURN	48	CONDENSATE	48	WASTEWATER	48	WASTEWATER
49	CONDENSATE RETURN	49	CONDENSATE	49	WASTEWATER	49	WASTEWATER
50	CONDENSATE RETURN	50	CONDENSATE	50	WASTEWATER	50	WASTEWATER

1. PIPING TO S-2702A/B SHOULD BE SYMMETRICAL.  
 2. S-2702A & B TO BE AT EQUAL ELEVATIONS.  
 3. SAMPLE CONNECTION - SEE DETAIL "A" ON EPU 4 UP 7.  
 4. EQUIPMENT PIPING AND INSTRUMENTATION SHOWN IN PACKAGE ARE TYPICAL DETAILS ARE TO BE PROVIDED AFTER VENDOR SELECTION.

ITEM NOS.	DESCRIPTION
A-2711	P-2711 A/B
A-2717	P-2717 A/B
A-2723	P-2723 A/B
B-2704	P-2704
B-2705	P-2705
B-2706	P-2706
B-2707	P-2707
CL-2702	P-2702
M-2703	P-2703
P-2719A	P-2719A
P-2719B	P-2719B
P-2711A	P-2711A
P-2711B	P-2711B
PSV-2736	PSV-2736

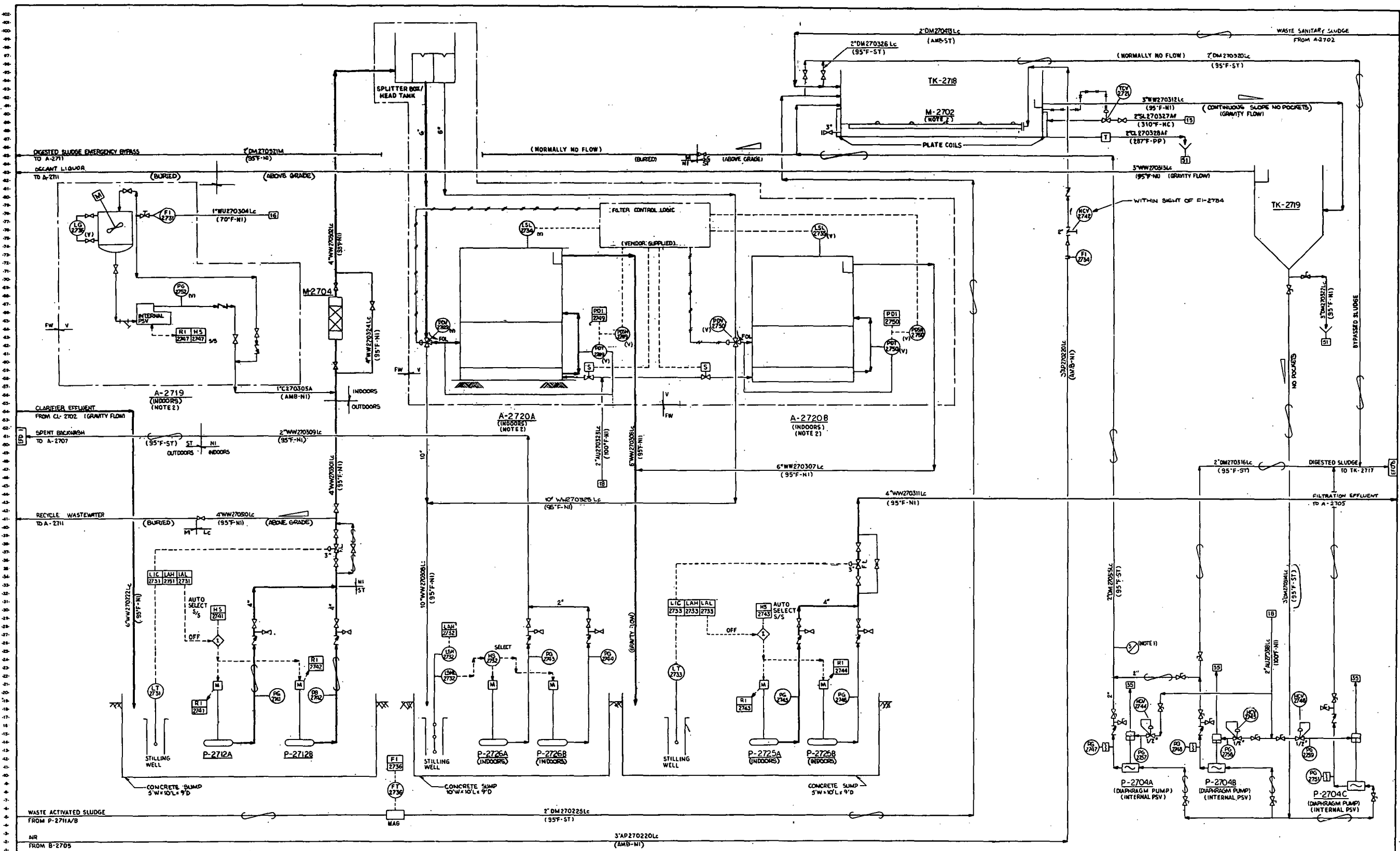
DEPARTMENT OF ENERGY  
 COAL CONVERSION DIVISION  
 WASHINGTON, D.C.  
 CONOCO COAL DEVELOPMENT COMPANY  
 STAMFORD, CONNECTICUT

**PIPELINE GAS DEMONSTRATION PLANT**  
 NOBLE COUNTY, OHIO  
 CONTRACT NO. EG-77-C-01-7547

**FOSTER WHEELER ENERGY CORPORATION**  
 110 SOUTH ORANGE AVENUE  
 LIVINGSTON, NEW JERSEY

**ENGINEERING FLOW DIAGRAM**  
 DAF/BIOLOGICAL TREATMENT  
 WASTEWATER SECTION 2700

DATE: 11-19-80  
 DRAWN: J.S.  
 CHECKED: J.S.  
 APPROVED: J.S.  
 SCALE: NONE  
 SHEET: 2 OF 7  
 NUMBER: 1910-1-50-2700-0

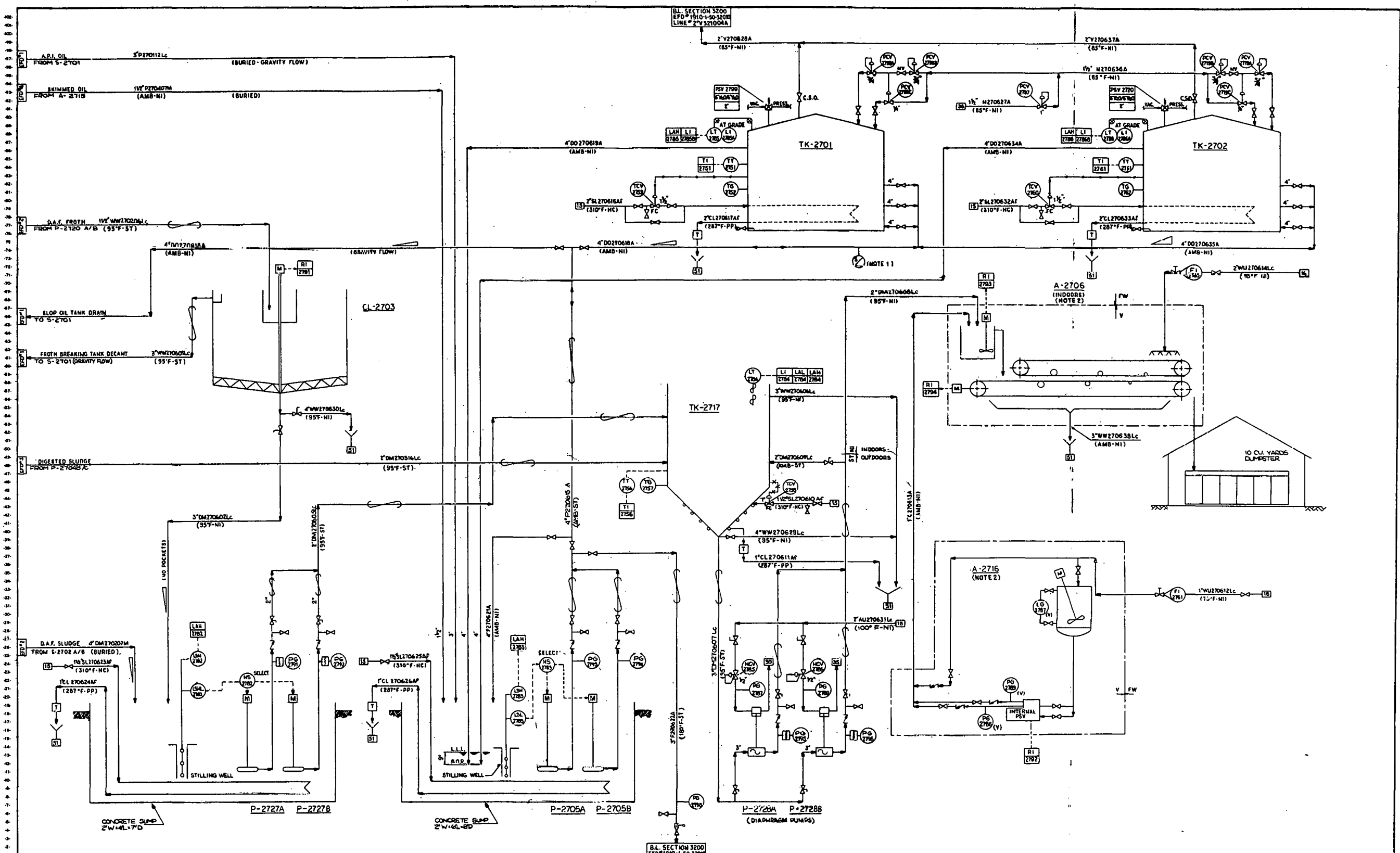


L COOLING WATER SUPPLY M COOLING WATER RETURN N 100% H.P. STEAM D 100% L.P. STEAM	R SERVICE WATER S POTABLE WATER T PLANT AIR U INSTRUMENT AIR V CLEAN WATER SEWER	W L.P. CONDENSATE X TREATED WATER Y FUEL GAS Z FUEL GAS AA CLEAN WATER SEWER	AB ONLY WATER SEWER AC PROCESS SEWER AD SANITARY SEWER AE FIRE WATER AF GAS LIQUOR VENT	AG L.P. FLAME AH PURGE GAS AI BLOWDOWN AJ FLARE AK TO ATMOSPHERE	AL L.P. WENT GAS (INTRUDER) AM H.P. WENT GAS (INTRUDER) AN INSTRUMENT PURGE GAS AO GAS LIQUOR SLOP DRAIN AP FRESHWATER SLOP DRAIN	AQ H.P. WELLS FEED WATER AR 100% H.P. SUPPLY AS 100% L.P. SUPPLY AT 100% H.P. RETURN AU 100% L.P. RETURN AV DUST COLLECTION SYSTEM	AW WASTE WATER SEWER AX SANITARY SEWER AY FRESHWATER SEWER AZ WASTE WATER SEWER BA SANITARY SEWER BB FRESHWATER SEWER	1. SAMPLE CONNECTION - SEE DETAIL 'A' ON EFD 4 OF 7. 2. EQUIPMENT, PIPING AND INSTRUMENTATION SHOWN IN PACKAGE ARE TYPICAL. 3. DETAILS ARE TO BE PROVIDED AFTER VENDOR SELECTION.	ITEM NOS. THIS DWG. A-2718 A-2720 A/B M-2702 P-2704 A/B/C P-2704 A/B/C P-2725 A/B P-2725 A/B TK-2718 TK-2719	DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C. COMOCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT	PIPELINE GAS DEMONSTRATION PLANT NOBLE COUNTY, OHIO CONTRACT NO. EF-77-C-01-2542 FOSTER WHEELER ENERGY CORPORATION 110 SOUTH ORANGE AVENUE LIVINGSTON, NEW JERSEY ENGINEERING - FLOW DIAGRAM WASTE WATER TREATMENT SECTION 2700
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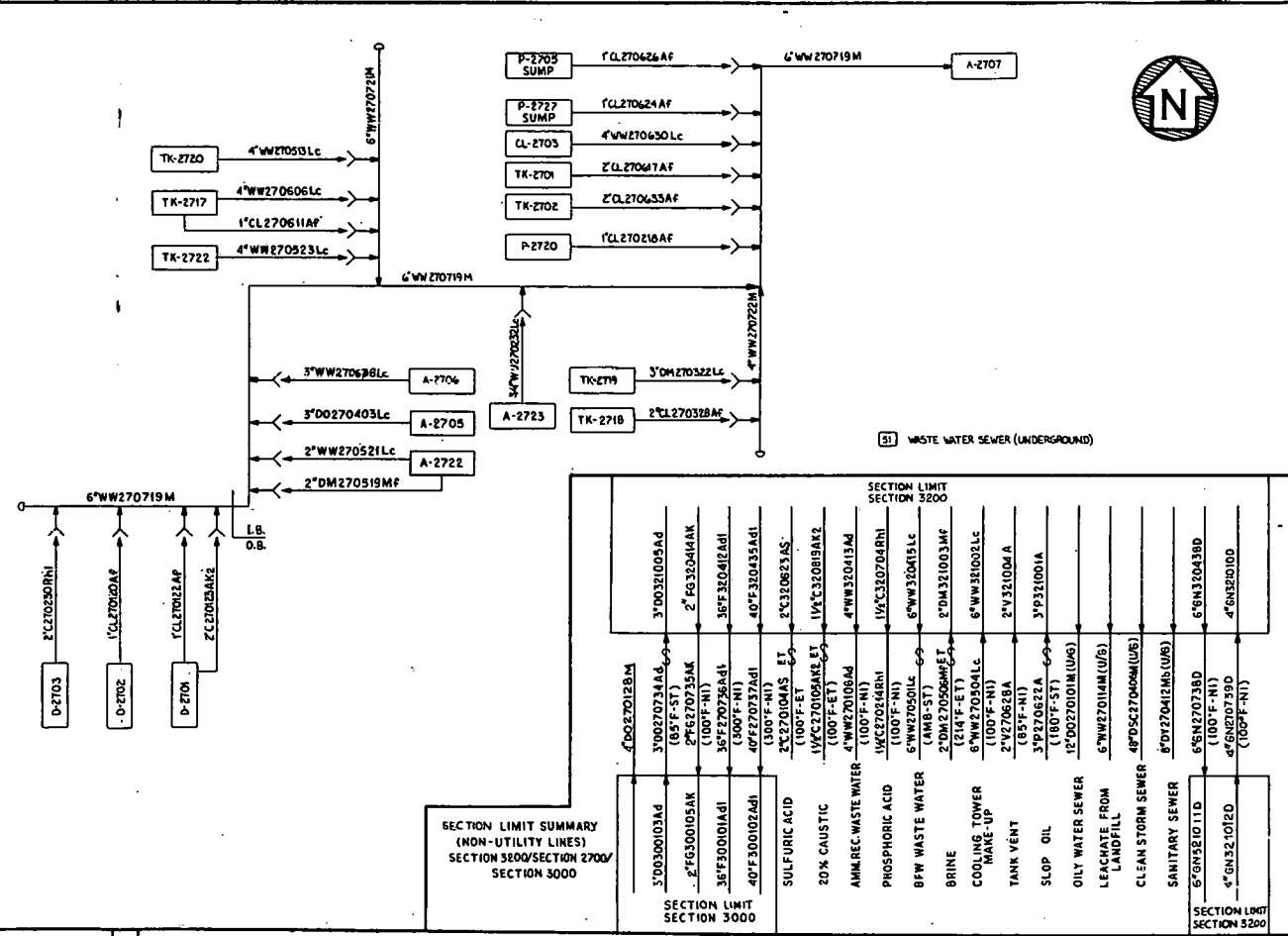
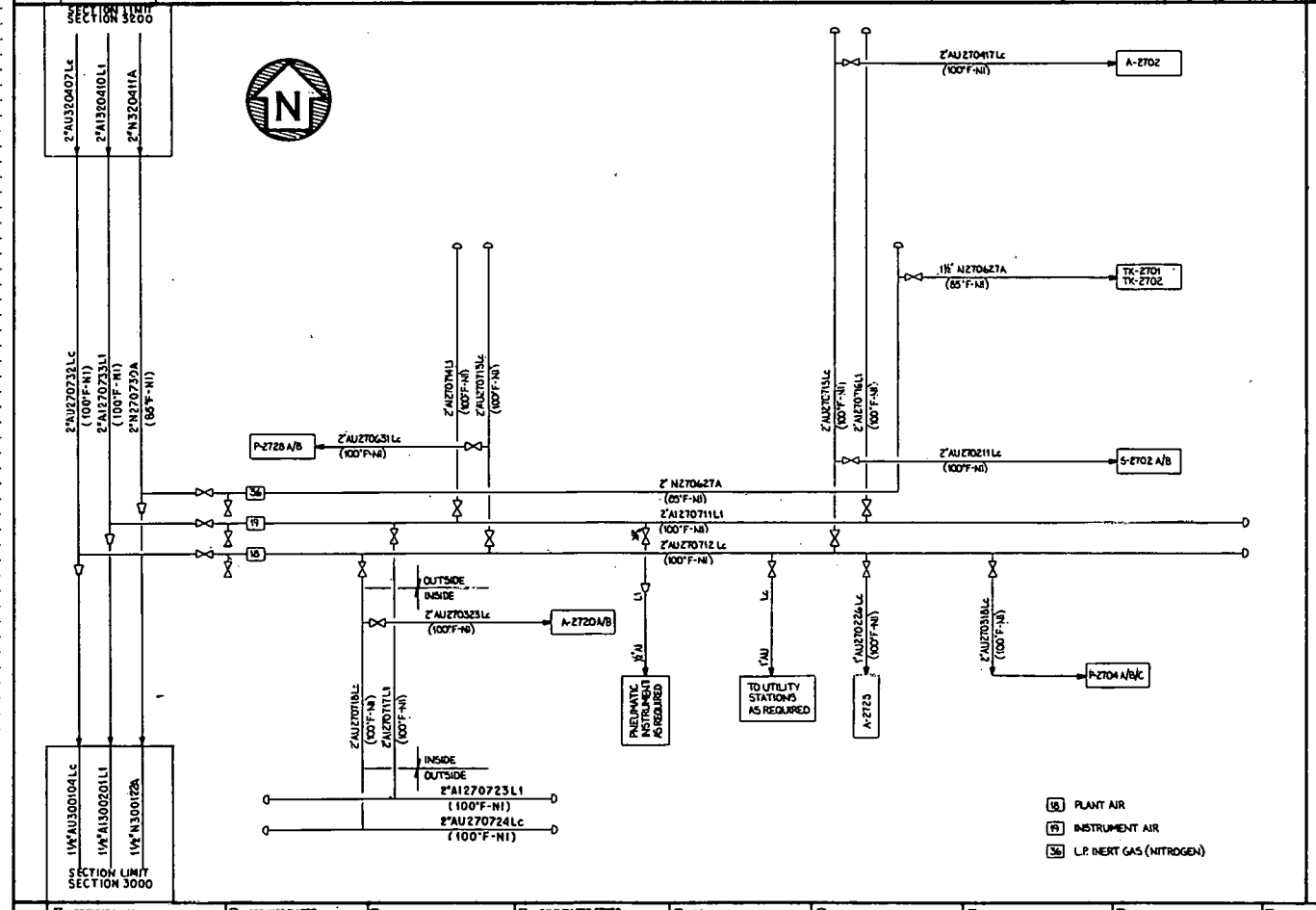
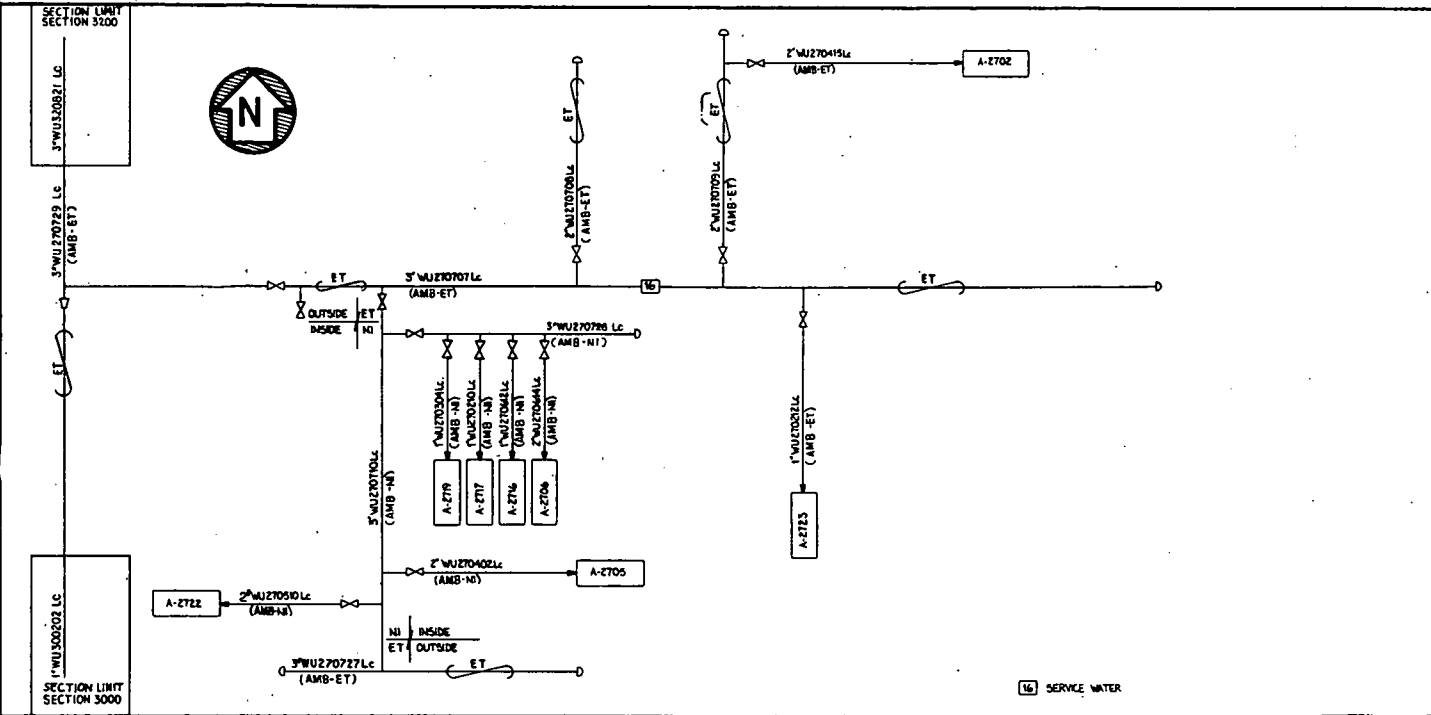
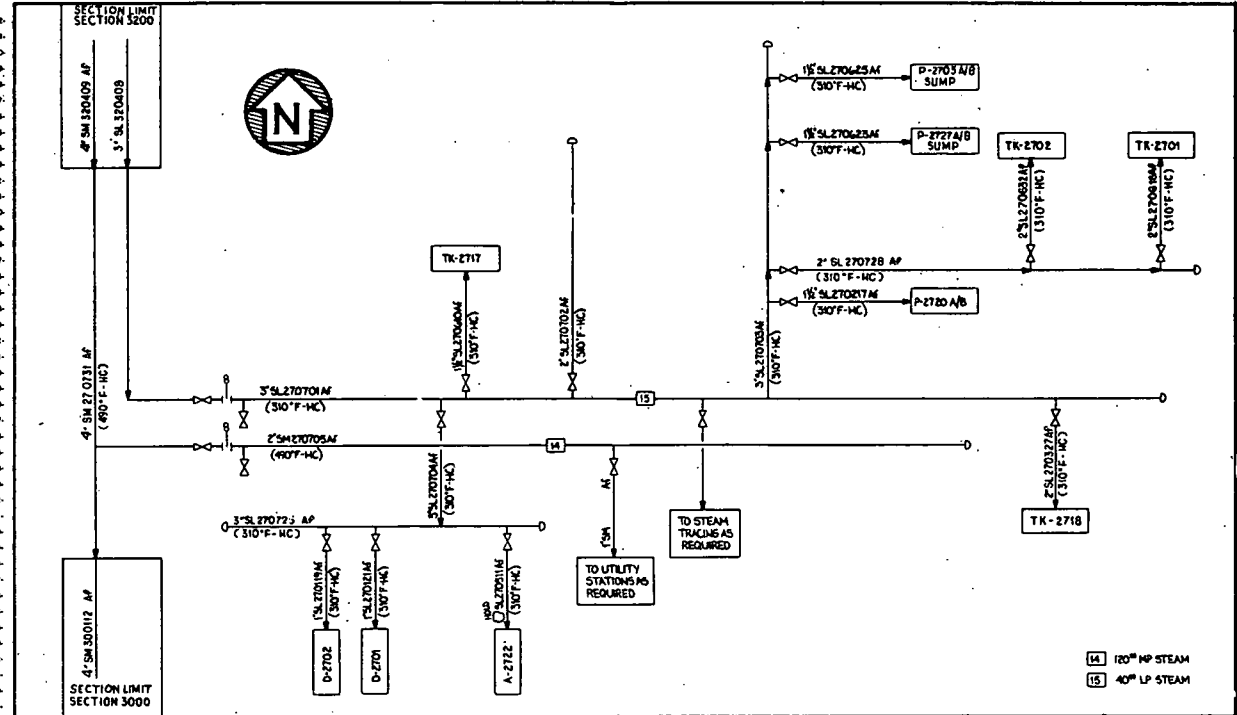








L. COOLING WATER SUPPLY M. COOLING WATER RETURN N. BOILING STEAM O. INSTRUMENT AIR P. AIR P. STEAM		Q. SERVICE WATER R. POTABLE WATER S. PLANT AIR T. INSTRUMENT AIR U. AIR CONDENSATE		V. L.P. CONDENSATE W. TREATED WATER X. FUEL OIL Y. FUEL GAS Z. CLEAN WATER SEWER		AA. WASTE WATER SEWER AB. PROCESS SEWER AC. SANITARY SEWER AD. FIRE WATER AE. GAS LUBRICANT		AF. L.P. FLAME AG. PURGE GAS AH. SMOKE AI. FLAME AJ. TO ATMOSPHERE		AK. L.P. SHORT GAS (OFFGAS) AL. L.P. SHORT GAS (OFFGAS) AM. INTERMEDIATE PURGE GAS AN. GAS LUBRICANT SLOP DRAIN AO. PRESSURIZED SLOP DRAIN		AP. H.P. STEAM FEED HEATER AQ. H.P. STEAM FEED WATER AR. STEAM TO BEAK AS. CARBONATE DRAFF DRAIN AT. METEOROL DRAIN		AU. H.P. REPAIR SUPPLY AV. H.P. REPAIR SUPPLY AW. H.P. REPAIR RETURN AX. H.P. REPAIR RETURN AY. H.P. REPAIR RETURN		AZ. H.P. WATER SEWER BA. GAS LUBRICANT		BB. H.P. WATER SEWER BC. H.P. WATER SEWER BD. H.P. WATER SEWER BE. H.P. WATER SEWER BF. H.P. WATER SEWER		BG. H.P. WATER SEWER BH. H.P. WATER SEWER BI. H.P. WATER SEWER BJ. H.P. WATER SEWER BK. H.P. WATER SEWER		BL. SECTION 3200 EFD # 1910-1-50-3200 LINE # 3'P321001A		1. SAMPLE CONNECTION - SEE DETAIL "W" ON EFD # A. 2. EQUIPMENT, PIPING & INSTRUMENTATION SHOWN IN PACKAGE ARE TYPICAL. DETAILS ARE TO BE PROVIDED AFTER VENDOR SELECTION.		ITEM NOS. THIS DWG. A-2706 A-2716		DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C. CONOCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT		PIPELINE GAS DEMONSTRATION PLANT HOWLE COUNTY, OHIO CONTRACT NO. EP-77-C-DI-2542 FOSTER WHEELER ENERGY CORPORATION 11111111111111111111 NEW BRUNSWICK	
P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B		P-2705A P-2705B P-2727A P-2727B P-2728A P-2728B							



SECTION LIMIT SUMMARY  
SECTION 3000/SECTION 2700/  
SECTION 3000

COOLING WATER SUPPLY COOLING WATER RETURN 180°F PL. STEAM 150°F PL. STEAM 40°F PL. STEAM	SERVICE WATER POTABLE WATER PLANT AIR INSTRUMENT AIR M.P. COMBUSTION	L.P. OXYGENATE TREATED WATER FUEL OIL FUEL GAS CLEAN WATER SEWER	OILY WATER SEWER PROCESS SEWER SANITARY SEWER FIRE WATER GAS LIQUOR VENT TO ATMOSPHERE	L.P. FLARE FURGE GAS BLOWDOWN FLARE TO ATMOSPHERE	L.P. WENT GAS (NITROGEN) H.P. WENT GAS (NITROGEN) INSTRUMENT PURGE GAS GAS LIQUOR SLOP DRAIN PHENOLYAN SLOP DRAIN	L.P. BOILER FEED WATER H.P. BOILER FEED WATER DISCHARGE TO GRADE CARBONATE SLOP DRAIN RECTROL DRAINS	150°F REPRIS. SUPPLY 140°F REPRIS. SUPPLY 133°F REPRIS. RETURN 144°F REPRIS. RETURN DUST COLLECTION SYSTEM	WASTE WATER SEWER WASTE WATER SEWER	ITEM NOS. THIS DWG.	DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C.	PIPELINE GAS DEMONSTRATION PLANT MOBILE COUNTY, OHIO CONTRACT NO. EF-77-C-01-2542	FOSTER WHEELER ENERGY CORPORATION 115 SOUTH DRAGON HOLLOW LIVINGSTON, NEW JERSEY	UTILITY HEADER DIAGRAM WASTE WATER TREATMENT SECTION 2700	DRAWN: MIKE H. DATE: 12-3-80 CHECKED: J. L. DATE: 2-5-81 APPROVED: J. L. DATE: 3-9-81
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18.13 PLOT PLAN

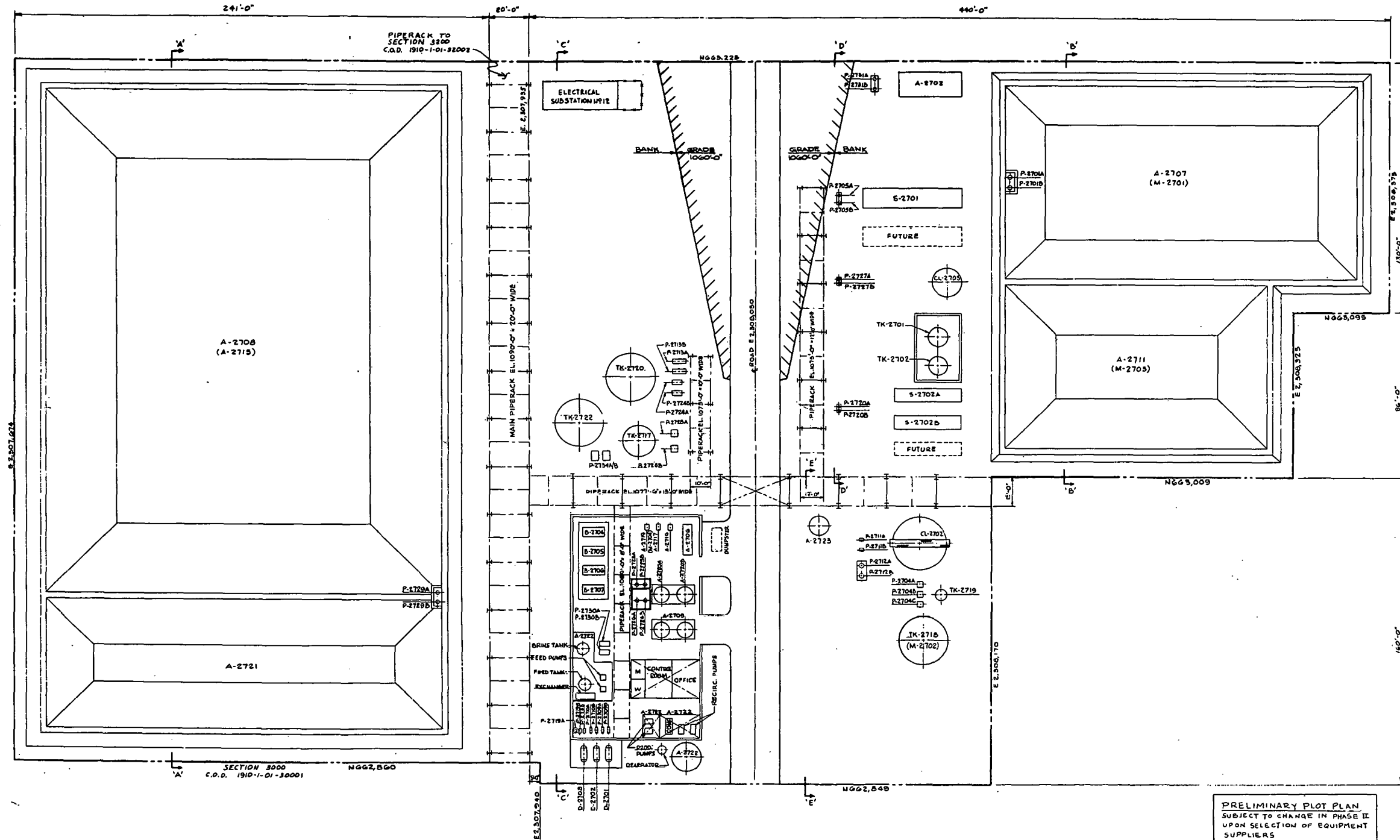
The following Plot Plan Drawings are included in this section:

<u>Drawing No.</u>	<u>Title</u>
1910-1-01-27001	Plot Plan
1910-1-01-27006	Plot Plan - Elevation



**GENERAL NOTES**  
 GRADE ELEVATION 1060'-0"  
 BASED ON ACTUAL ELEVATION  
 ABOVE SEA LEVEL.

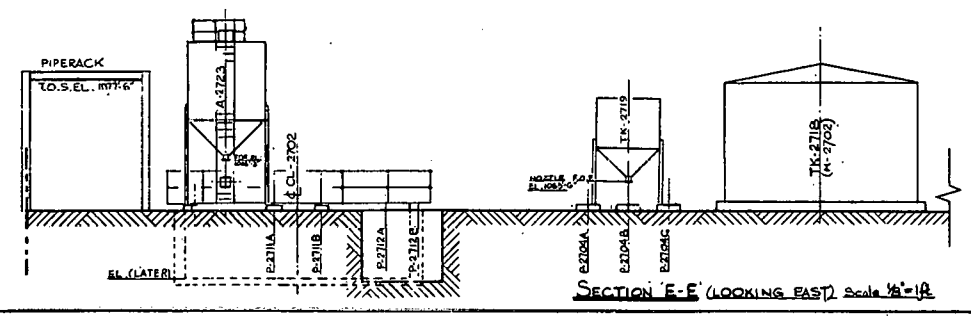
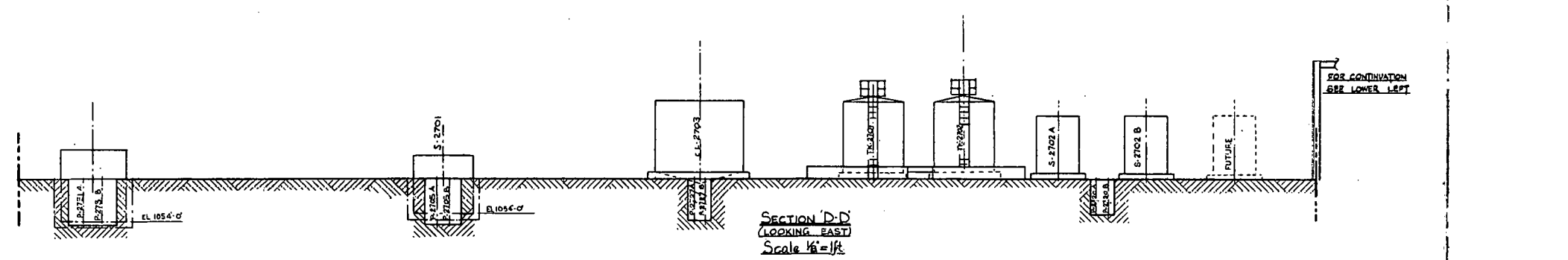
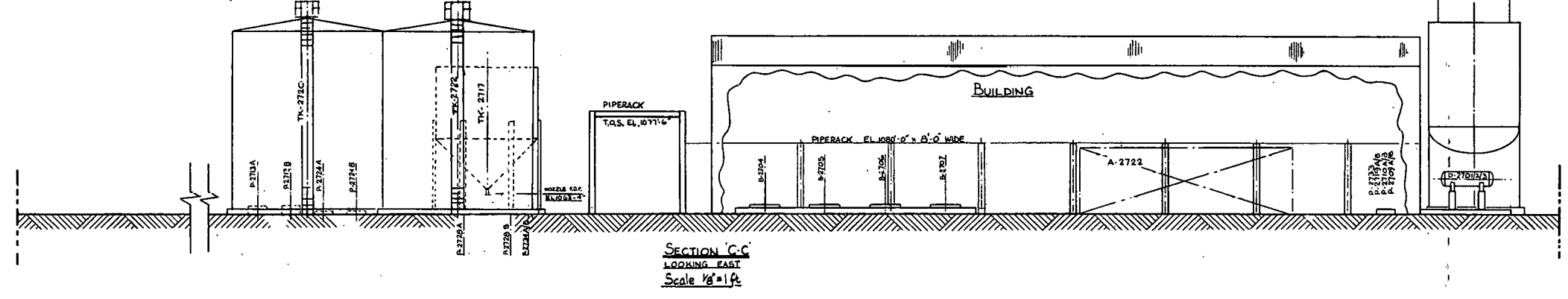
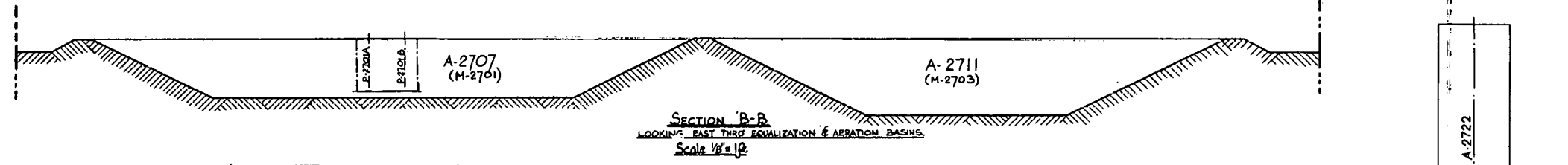
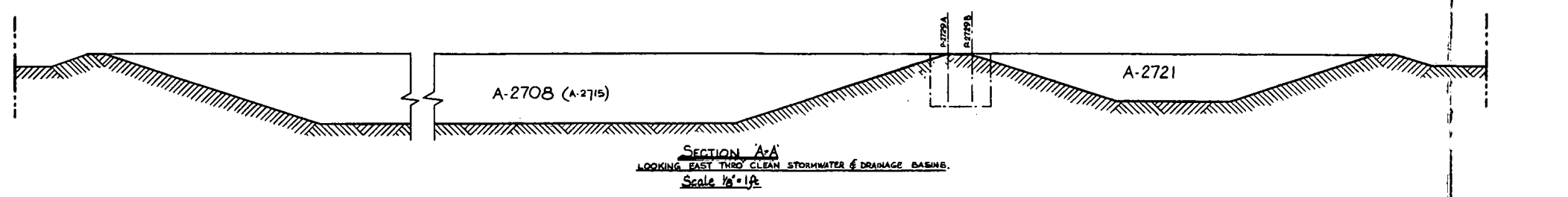
**REFERENCE DRAWINGS**  
 KEY PLOT PLAN 1910-1-01-0000  
 SECTIONS 1910-1-01-2700  
 PLOT PLAN - SECTION 3000 1910-1-01-3000  
 PLOT PLAN - SECTION 3200 1910-1-01-3200



DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C.	PIPELINE GAS DEMONSTRATION PLANT HOBBS COUNTY, OHIO CONTRACT NO. EF-77-C-01-2542	PLOT PLAN WASTEWATER TREATMENT SECTION 2700
CONMCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT	FOSTER WHEELER ENERGY CORPORATION 110 SOUTH DEANBY AVENUE LIVINGSTON, NEW JERSEY	DATE: 1910-1-01-2700 SHEET 1 OF 2

25 FEB 81 TASK II CONSISTENCY REVIEW | D 4 DEC 80 REDRAWN TASK II REPORT ISSUE | C 2 MAY 80 MODEL REVIEW | D 28 MAR 80 CONSISTENCY REVIEW | A 21 MAR 80 INITIAL ISSUE

**GENERAL NOTES**  
 FOR GENERAL NOTES & REFERENCE DRAWINGS SEE PLOT PLAN 190-1-C-2100/



PRELIMINARY PLOT PLAN  
 SUBJECT TO CHANGE IN PHASE II  
 UPON SELECTION OF EQUIPMENT  
 SUPPLIERS.

DEPARTMENT OF ENERGY COAL CONVERSION DIVISION WASHINGTON, D.C. CONOCO COAL DEVELOPMENT COMPANY STAMFORD, CONNECTICUT	PIPELINE GAS DEMONSTRATION PLANT MOBILE COUNTY, OHIO CONTRACT NO. EF-77-C-01-2542	PLOT PLAN-ELEVATIONS WASTEWATER TREATMENT SECTION 2700
DATE: 11/15/77 DRAWN BY: JWB CHECKED BY: JWB APPROVED BY: JWB	FORSTER WHEELER ENERGY CORPORATION 110 SOUTH GRAND AVENUE LIVINGSTON, NEW JERSEY	SHEET NO. 14-100 DATE: 11/15/77 SCALE: 1/8"=1'-0" SHEET 2 OF 2 DRAWING NO. 190-1-C-2100/5