PM ✓ 9-8-06 20.8.3

RE: Valley Village MHP VARIANCE REQUEST
Ottumwa, Iowa Iowa Department of Natural Resources

1.	Date:	7/7/99	13.	Decision:	Approved
2.	Review Engineer:	Fred Evans		Date:	7/16/99
3.	Date Received:	5/19/99	14.	Appeal:	
4.	County Number:	90		Date:	
6.	Program Area:	CP (Wastewater)			
7.	Facility Type:	C08			
8.	Subject Area:	371			
9.	Rule Reference:	900-64.2(9)a			
10.	Design Stds Ref:	20.8.3			
11.	Consulting Engr:	Garden & Associates			
12.	Variance Rule:	900-64.2(9)c			

15. **Description of Variance Request**

The consulting engineer has requested a variance to design a chlorine contact tank for the Valley Village MHP with approximately a 24 to 1 length to width ratio in lieu of the 40 to 1 length to width ratio required by Section 20.8.3 of the Iowa Wastewater Facilities Design Standards.

16. **Consulting Engineer's Justifications**

Please note we are also requesting a variance from Section 20.8.3 of the Iowa Wastewater Facilities Design Standards. As designed the contact tanks provide a length-to-width ratio of about 24:1 instead of the 40:1 required. It is our opinion the contact tanks as designed will reduce short-circuiting of flow to a practical minimum and result in adequate disinfection of the effluent. A tank(s) with a 40:1 length-to-width ratio was not designed for the following reasons:

1. Because the system operates at relatively small flows, it would be very difficult to construct a cast-in-place tank with a volume of only 2,000 gallons and a 40:1 length-to-width ratio. Therefore, the precast concrete septic tanks were used resulting in much easier construction and lower projects costs.

599-139

GARDEN & ASSOC.
P.O. BOX 451
OSKALOOSA, IOWA 52577
(AREA 515) 672-2526
FAX: (AREA 515) 672-2091

1999 MAY 19 A 10: 18

DEPT OF NATURAL RESOURCES

January 15, 1999

Wayne Farrand
Iowa Dept. of Natural Resources
Wallace State Office Building
900 East Grand Avenue
Des Moines, IA 50319

Re: Construction Permit Application
Wastewater Disinfection System
Valley Village Mobile Home Park
Ottumwa, Iowa
G & A 3098293

Dear Mr. Farrand:

Attached are two copies of the plans and specifications and Construction Permit Application Schedules A, G, H1 and P for the above referenced project. These are sent to you for review and issuance of a construction permit.

Please note we are also requesting a variance from Section 20.8.3 of the Iowa Wastewater Facilities Design Standards. As designed the contact tanks provide a length-to-width ratio of about 24:1 instead of the 40:1 required. It is our opinion the contact tanks as designed will reduce short-circuiting of flow to a practical minimum and result in adequate disinfection of the effluent. A tank(s) with a 40:1 length-to-width ratio was not designed for the following reasons:

1. Because the system operates at relatively small flows, it would be very difficult to construct a cast-in-place tank with a volume of only 2,000 gallons and a 40:1 length-to-width ratio. Therefore, the precast concrete septic tanks were used resulting in much easier construction and lower projects costs.

2. Effluent flows out of the treatment system are normally less than the 66 gpm, 1 pump capacity of the lift station because of the equalizing action of the polishing tank located prior to the contact tanks. This results in additional detention and treatment time in the contact tanks. To achieve a 66 gpm out of the system, the level of the 60' x 60' x 8' deep polishing tank will need to be raised about 2 inches or 4,500 gallons. The lift station pump would need to operate continuously for more than 68 minutes to transport 4,500 gpm to the polishing tank. This situation would be unlikely based on the population served and the past reported daily flows. Recently while calibrating the lift station pumps, flows to the lift station averaged 22 gpm.

Should you have any questions, please contact me.

Yours very truly,

Garden & Associates, LTD.

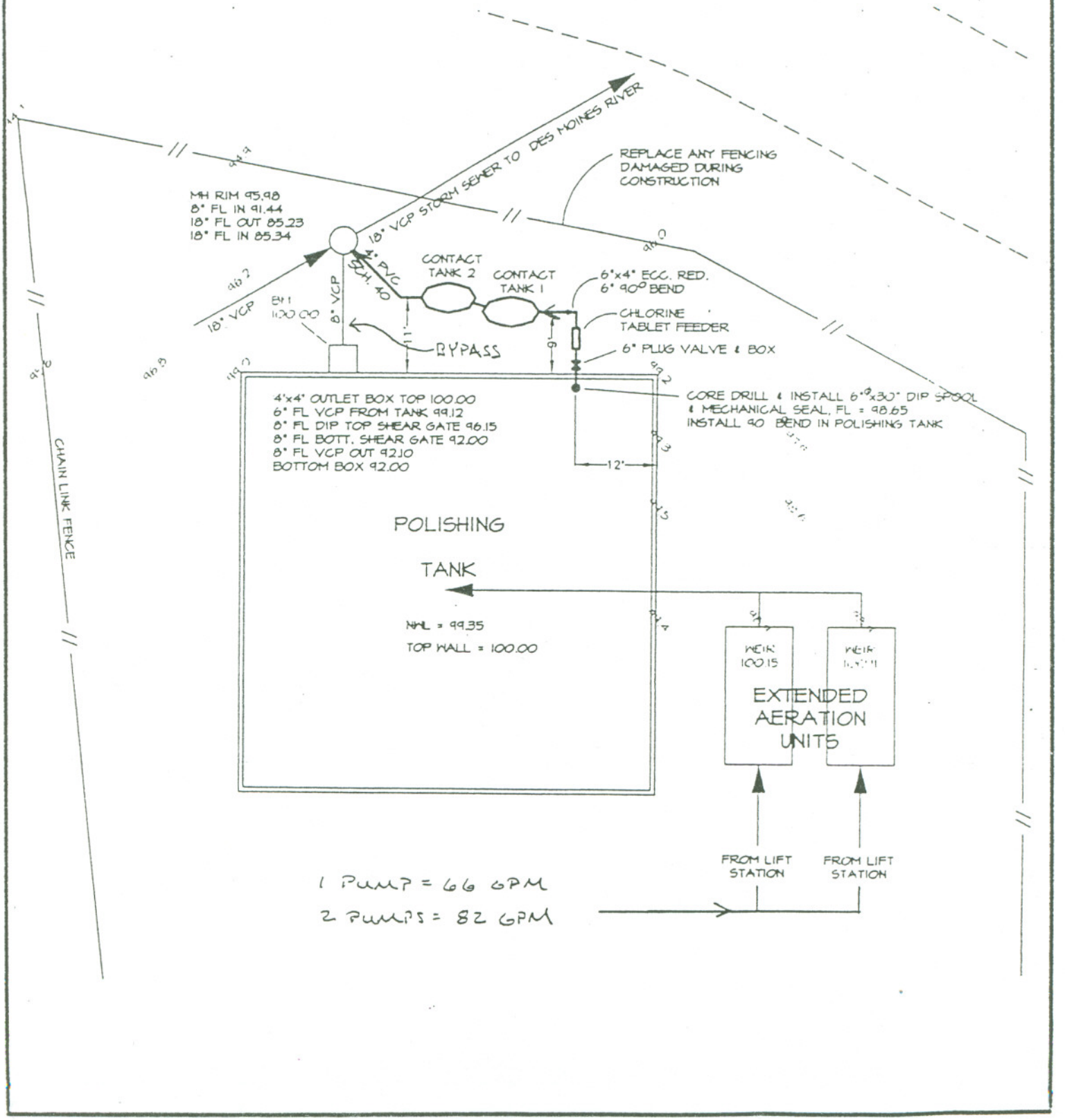
David C. Nelson, P.E.

ds
Enc:
CC: Harold Connell

IOWA DEPARTMENT OF NATURAL RESOURCES
WASTEWATER PERMITS SECTION
CONSTRUCTION PERMIT APPLICATION

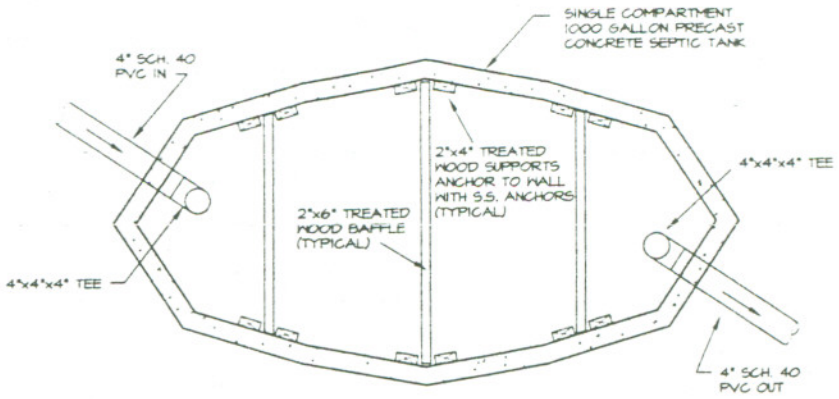
SCHEDULE H1, Schematic Flow Diagram

DATE PREPARED	PROJECT IDENTITY	DNR USE
January 5, 1999	Valley Village Mobile Home Park Disinfection System Ottumwa, Iowa	PROJECT NO.
DATE REVISED		PERMIT NO.



GENERAL NOTES

1. KEEP EXISTING WASTEWATER TREATMENT FACILITY IN OPERATION. COORDINATE ANY INTERRUPTIONS IN SERVICE WITH OWNER.
2. COOPERATE AND COORDINATE CONSTRUCTION ACTIVITIES WITH OWNER.
3. CONTRACTOR TO DETERMINE LOCATION OF UNDERGROUND UTILITIES AND PIPING PRIOR TO COMMENCING CONSTRUCTION AND TAKE MEASURES TO PROTECT FROM DAMAGE.
4. STORE EQUIPMENT AND MATERIALS WITHIN OWNER'S PROPERTY AT APPROVED LOCATIONS.
5. CONSTRUCT AS SHOWN ON PLANS AND AS SPECIFIED.
6. AS LAST ORDER OF CONSTRUCTION, REPLACE TOP-SOIL, FERTILIZE AND SEED.

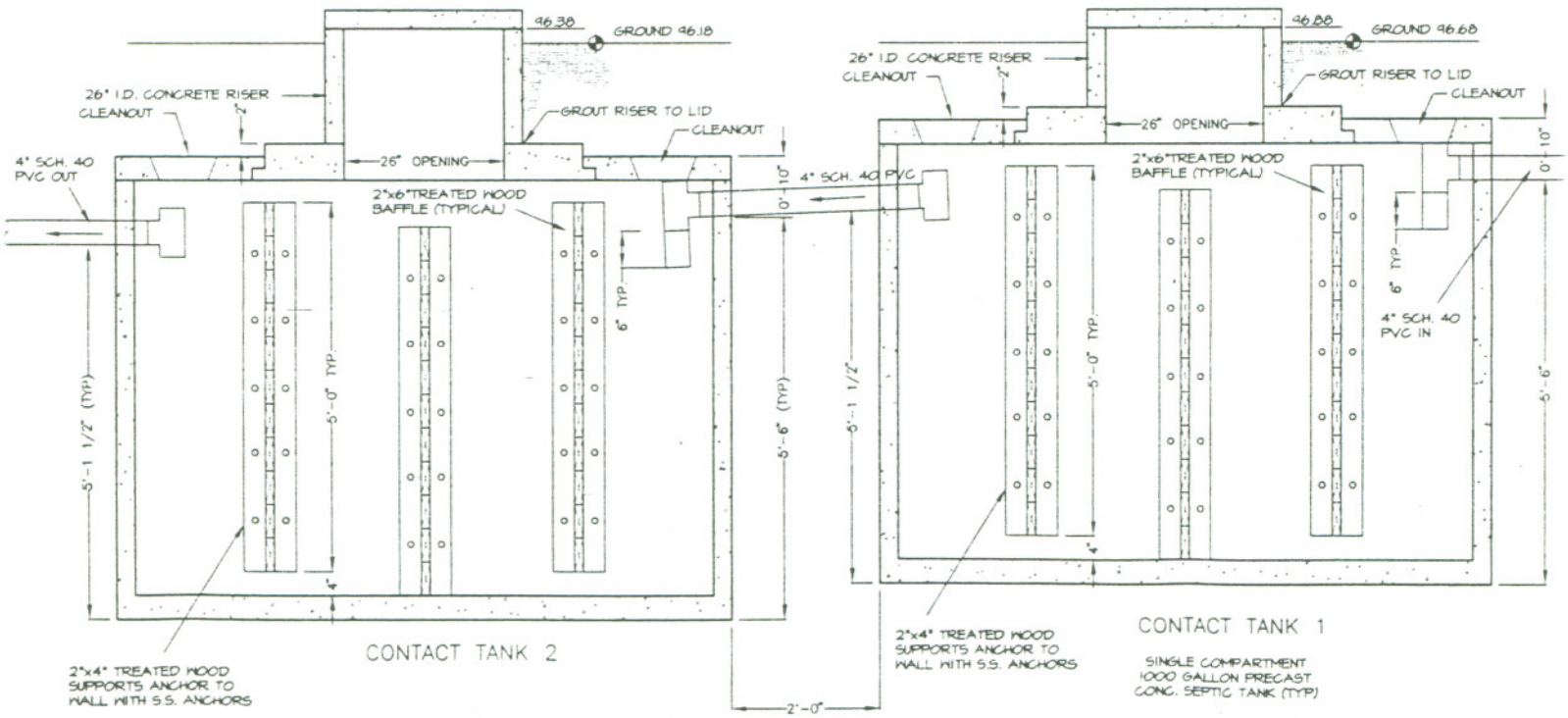


NOTE:
1. SEAL ALL PIPE PENETRATIONS WATERTIGHT.
2. SEAL ALL JOINTS IN STRUCTURE WATERTIGHT.

(TYPICAL TWO TANKS)

PLAN VIEW

NO SCALE



TYPICAL SECTION

NO SCALE

CHLORINE CONTACT TANK SCHEMATICS

IOWA DEPARTMENT OF NATURAL RESOURCES
WASTEWATER PERMITS SECTION
CONSTRUCTION PERMIT APPLICATION

SCHEDULE G, Treatment Project Design Data

DATE PREPARED	PROJECT IDENTITY	DNR USE
January 5, 1999	Valley Village Mobile Home Park Disinfection System Ottumwa, Iowa	PROJECT NO.
DATE REVISED		PERMIT NO.

1. Project Description Disinfection system for existing Valley Village Mobile Home Park

2. Design Basis:

Plant Design Loading		Present ADW	Present AWW	Present MWW	Maximum MObile Home Park Capacity ADW	Maximum MObile Home Park Capacity AWW	Maximum MObile Home Park Capacity MWW
Residential Waste	Population	281	//////////	//////////	350	//////////	//////////
	Flow, MGD		0.036	0.054		0.036	0.054
	BOD_5, #/day		48			60	
	TSS, #/day		56			70	
Out of Town Students	Number		//////////	//////////		//////////	//////////
	Flow, MGD						
	BOD_5, #/day						
	TKN, #/day						
Industrial	Flow, MGD						
	Rated Flow, MGD						
	BOD_5, #/day						
	TKN, #/day						
Other (Specify)	Flow, MGD						
	Rated Flow, MGD						
	BOD_5, #/day						
	TKN, #/day						
Infiltration	MGD						
Inflow	MGD						
Total	Flow, MGD		0.036			0.036	
	Rated Flow, MGD		0.036			0.036	
	BOD_5, mg/l		160			200	
	BOD_5, #/day		48			60	
	TKN, mg/l		187			233	
	TKN, #/day		56			70	

3. Peak Hourly Dry Weather Flow _____ MGD + Peak Hourly Infiltration _____ MGD + Peak Hourly Inflow _____ MGD = Total Peak Hourly Wet Weather Flow _____ MGD (In Design Year)

4. Identify effluent limitations

		BOD_5 day Avg	BOD_5 day Max	Suspended Solids Avg	Suspended Solids Max	NH_3-N Avg	NH_3-N Max	pH Avg	pH Max	Coliform, Fecal * Avg	Coliform, Fecal * Max
Operation Permit	mg/l	25.0	40.0	30.0	45.0			6.0	9.0	200	#1.00 ML
Effluent Limits	#/day	8.0	12.0	9.0	14.0						
Design Effluent Quality	mg/l										
	#/day										

* Summer Limits: April 1 through Oct. 31

5. Identify significant industrial/commercial contributors:

Waste Contributors	Pre-treat	Operation Hrs/Day	Operation Days/Week	Design Loadings Flow MGD Total	Flow MGD Rated	BOD_5 #/day	Susp. Solids #/day	TKN #/day	Oil & Grease #/day	#/day

IOWA DEPARTMENT OF NATURAL RESOURCES
WASTEWATER PERMITS SECTION
CONSTRUCTION PERMIT APPLICATION

SCHEDULE P, TABLET CHLORINATION

DATE PREPARED	PROJECT IDENTITY	DNR USE
January 5, 1999	Valley Village Mobile Home Park Disinfection System Ottumwa, Iowa	PROJECT NO.
DATE REVISED		PERMIT NO.

Chlorinator Room N/A

1. Is the building used for other purposes? _____
2. Do doors open only to the outside of the building? _____
   Is panic hardware provided? _____ Viewing window provided? _____
3. Forced air ventilation: _____ air changes/hour
   Activated by: _____
4. Other ventilation system: _____
5. Is the room heated? _____ How? _____
6. Is self-contained breathing equipment provided? _____
   Type _____
7. Method of chlorine leak detection? _____
8. Type of scale _____
9. Chlorine cylinder restraints provided? Yes ☐ No ☐

Chlorination Units

1. No. and type of units 1 - Dry chemical tablet feeder
2. Point of application After final sedimentation
3. Total rated capacity 30 lbs/day
4. Chlorine dosage range 8 mg/l at design flow
5. Water is supplied by N/A

Mixing

Is flash mixing provided? N/A Type _____

Chlorine Contact Tank

1. No. of tanks 2 Location After final sedimentation
2. Effective dimensions 4' x 8' each
3. Effective volume 2,000 gal.
4. Detention time 30.3 Min. at one pump rate of 66 gpm. Design flow to treatment.
   24.4 Min. at two pump rate of 82 gpm. Maximum flow to treatment.
   24.4 Min. at maximum pump rate of 82 GPM
5. Are tanks baffled to reduce short circuiting? Yes
   Length to width ratio 24:1
6. Method of draining Pumping w/septic tank pumping truck
7. Drainage discharge to Extended aeration tanks
8. Is service bypass provided? Yes Discharge to Existing outlet box

STATE OF IOWA
DEPARTMENT OF NATURAL RESOURCES
HENRY A. WALLACE BUILDING
DES MOINES, IA 50319

CONSTRUCTION PERMIT

Valley Village Mobile Home Park
11620 Rabbit Run Road
Lot 105
Ottumwa, IA 52501

Permit No.: 99-361-S
File: Valley Village MHP - Sewage
Re: Wastewater Disinfection System
Project No.: S99-139

In accordance with the provisions of Section 455B.173.3 and 455B.174.4 Code of Iowa, and Rule 567--64.2(455B) or Rule 567--65.6(455B), or Rule 567--43.3(455B) of the Iowa Administrative Code, the director of the Department of Natural Resources does hereby issue a permit for the construction of:

Model ITR 4000-S chlorine tablet feeder, two 1,000 gallon chlorine contact tanks with "over and under" baffling, mechanical seal, plug valve, piping and all miscellaneous associated work and appurtenances to complete the project in accordance with the approved plans and specifications.

The wastewater disinfection system approved under this construction permit is designed to provide disinfection of the discharge of an average daily hydraulic loading of 36,000 GPD from the existing wastewater treatment facilities. The disinfection system has been designed to meet a maximum fecal-coliform effluent limit of 260 organisms/100 ml during the months of April thru October.

By issuance of this construction permit Number 99-361-S we are hereby granting a variance for a length to width ratio for the chlorine contact tanks which is less than the 40 to 1 length to width ratio required under Section 20.8.3 of our design standards.

The construction of the project shall be initiated within one year of issuance of this permit or this permit is no longer valid. Within thirty days after completion of construction, the permit holder shall submit a certification by a licensed professional engineer that the project was completed in accordance with the approved project documents.

Pursuant to Section 455B.174.4, Code of Iowa, you have the right to appeal any condition of this permit by filing with the director of the Department of Natural Resources a notice of appeal and request for administrative hearing within thirty days of receipt of this permit.

Contact Fred M. Evans at 515/281-8995 with any questions or comments.

For the Department of Natural Resources:

PAUL W. JOHNSON, DIRECTOR

By: _____
Environmental Protection Division

Date: July 19, 1999

cc: Wapello County Board of Health, Ottumwa, IA
Garden & Associates, Ltd., Oskaloosa, IA
Field Office #6

FME189A.pa

Plan Distribution

1 Engineer; 1 Field Office; 1 DNR File

2. Effluent flows out of the treatment system are normally less than the 66 gpm, 1 pump capacity of the lift station because of the equalizing action of the polishing tank located prior to the contact tanks. This results in additional detention and treatment time in the contact tanks. To achieve a 66 gpm out of the system, the level of the 60' x 60' x 8' deep polishing tank will need to be raised about 2 inches or 4,500 gallons. The lift station pump would need to operate continuously for more than 68 minutes to transport 4,500 gpm to the polishing tank. This situation would be unlikely based on the population served and the past reported daily flows. Recently while calibrating the lift station pumps, flows to the lift station averaged 22 gpm.

17. **Department's Justifications** It is recommended that the variance request to design for a 24 to 1 length to width ratio be approved based upon the engineer's justification and the following additional considerations

1. The existing polishing tank has a detention time of 5+ days for the design AWW flow of 36,000 GFD. In addition to providing a throttling affect on wastewater flows, some natural die off of fecal coliform organisms should occur in the open polishing tank.

2. Even if the flows thru the chlorine contact tanks should reach the pump capacity of 66 gpm, the detention time in the tanks would be double the minimum 15 minute detention time required in the design standa

18. **Precedents Used**

None

9.	Staff Reviewer: Fred Espinosa	Date: 7/9/99
0.	Supervisor: Wayne Farrand	Date: 7/12/99
1.	Authorized by: Jack Riesbeck	Date: 7/16/99