

Springfield

June 7, 1968

Use of 38,000 gal. VCM Cars

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File

Vinyl chloride dock facilities at Springfield are designed to accommodate the unloading of three 31,400 gal. tank cars. The distance from center line of dock to center line of dock is 70' 0". There are three such docks. Since we are limited on the east end by a high embankment and the west end by production facilities, there is little possibility of extending track facilities.

We can, and have, however, unloaded one 38,400 gal. capacity car with the present facility. This is done at the center dock. We can also unload one 31,400 gal. car at the same time as the 38,400 gal. car but this is the limit.

In summary, therefore, with the present facility, we will be able to unload three 31,400 gal. cars or one 38,400 gal. car, and one 31,400 gal. car at the same time. We cannot unload more than one 38,400 gal. car without a railroad switch. Since the physical area has already been taxed to the fullest, chances for dock revision are not good. It would be better, for our purposes, to limit the use of 38,400 gal. cars to a 50-50 mix with the 31,400 gal. cars.

R. W. Bueker

1850

12/16/69

Don. MILLER

SUBJECT: POTENTIAL AREA FOR COST REDUCTION - REVISE VCM UNLOADING SYSTEM

REF: 2111 & 2112, PUC EXPANSION, 10/10/69

I. ORIGINAL DESIGN CONCEPT (REF)

A. TOTAL VCM REQUIREMENTS

NEW PLANT	220 # H PUC	
BLDG 84	40 # H PUC	
TOTAL	260 # H PUC	= 274 # H UCM/YR

B. TOTAL VCM STORAGE

EXISTING	178,000 GAL RATED	@ 90%	160,000 GAL USABLE
NEW SPHERE	315,000 GAL RATED	@ 90%	283,000 " "
TOTAL			443,000 " "

C. AVERAGE VCM REQUIREMENTS

$$274 \# \frac{\text{UCM}}{\text{YR}} \times \frac{1 \text{ GAL}}{7.5 \#} \times \frac{\text{YR}}{365 \text{ DAYS}} = 100,000 \text{ GAL/DAY}$$

D. UNLOADING REQUIREMENTS, AVERAGE
(30,000 GAL/CAR)

No. Days Unloaded	# CAR/DAY
7	3.4
6	3.9
5	4.7

E. USABLE STORAGE INVENTORY

$$\frac{443,000 \text{ GAL STORAGE}}{100,000 \text{ GAL/DAY}} = 4.43 \text{ DAYS STORAGE}$$

NEW EQUIPMENT

08-301	veg unloading equipment
08-302	" "
08-303	STORAGE TRANSFER PUMP
08-304	STORAGE SPHERE, 7.5 M EEL + EXCAVATION, DIRT &
	STORAGE SLOPE DRAINAGE SYSTEM
08-305	veg SPHERE PUMP
08-306	veg K-O TANK
08-307	" " "
08-308	Bldg & veg TRANSFER PUMP
08-309	" " "
08-310	veg FILTER

OTHER ... Eliminate restrictions in existing unloading lines
consistent with new objectives of 5 cars unloaded
in 8 hrs

OTHER ... REUSE &/or install TANK car unloading spots to handle
5 cars

G. Mode of Operation

1. Unload up to 5 cars per day during 8 hour day shift into
existing buffer storage tanks
2. Pump from buffer storage tanks to new spheres, automatically based
on veg level in sphere
3. Charge from sphere to new veg water tanks, on demand, automatically.

II. REFINED CONCEPT FOR EVALUATION

A. TOTAL VEH. REQUIREMENT NC

B. TOTAL VEH. STORAGE
EXISTING 160 GAL usable

C. Avg. Veh. Req. NC

D. Unloading Requirements
Average Veh. Used 23.8 cars per week
Average Switch del.
For 6 days del 4 cars per day.

E. Usable Storage Inventory
EXISTING 160 GAL
* TAKE CAR $(5-3.4) \times 30,000$ 50 GAL
210 GAL $\div$ 2.1 days

* Five cars delivered on 6th day; no delivery on 7th day
Usage during 7th day 3.4 cars
Inventory Available in Car 1.6 cars

F. NEW EQUIPMENT

08-305 "Sphere" Pump
08-306 Blg & 4" RCH TRANSFER PUMP
08-309 " " " "
08-310 RCH FILTER

+ UNLOADING PUMP

NOTE - LEASE 1/4" INSTAL TRUCK CAR UNLOADING SPOT TO
HANDLE 5 CARS

(ALL OTHER EQUIP UNNECESSARY ... \$ SAVING ... \$ 300,000 CAPITAL

9. Mode of Operation

1. Unload up to 5 cars per day in 24 hour day into existing buffer storage tank. Use existing lines, compressors, etc
2. Change from buffers to new veg weigh tanks, on demand, automatically.

Note: RR cars delivered on 6 day schedule. Max 5 cars

Operate unloading on 7 day - 3 shift basis.

Total inventory after Sor switch must be 250,000⁽¹⁾ gal between fixed storage & RR cars to provide continuous operation for 48 hour period until Monday Switch

$\therefore$ Fixed Storage $\approx$ 100,000 gal (vs 100,000 gal cap)
RR Cars $=$ 150,000 gal (5 x 30,000)

A.P. TURPINZANO

(1) 25% greater than average used to handle variations in plant consumption over 2 day period

I

Present unloading schedule 2 cars/11 hrs -

Available time for 2 cars less switching time

Switching time = 2 - 4 hrs -

∴ Unloading time = 18 - 22 hrs

Required unloading time

$$\frac{11}{2} \times 3.4 = 17.6 \text{ hrs} -$$

Available for switching 6.4 hrs

But

1. No down time available for

1. Repairs
2. Down time on RCM compressors
ie use unloading compressors as spare
3. Late railroad switching
- 4.

2. No allowance for production peaking
(No storage available for under average production)

3. Because of the nature of unloading we need
that more & more unloading

Cost of Disposal

1. Week-end schedule (Sat & Sunday)

$$32 \times 52 \times \frac{1}{2} \text{ time} \times 3.705 \times 1.23 = 3,792/\text{yr}$$

(1541)

2. Holiday schedule

$$16 \times 10 \times \frac{1}{2} \times 3.705 \times 1.23 = 1,093/\text{yr}$$

3. Holiday switch

$$10 \times 577.82 = 5,778$$

4. Add. Sunday switch

$$1/\text{Month} = 12 \times 577.82 = 6,934$$

5. Inefficient operating cost

3 Shifts vs 1 shift. They:

$$3.705 \times 120 \times 52 \times 1.23 = 2,853$$

v to hrs/wk

$$20,042$$

VCM Req

Original

Revised

PVC

New Plant

220 M³/yr

84'

40 M³/yr

Total

260 M³/yr

VCM Equip

274 M³/yr

274 M³/yr

Storage

Existing

178 Mg (160) scpl

New

315 Mg (282)

178 (160)

Total

443 Mg

160

Requirements (USA)

100 Mg

100 Mg/da

1 - Unloading

3.4 (7da)

3.4 7da

3.9 (6da)

3.9 6da

4.7 (5da)

4.7 5da

Usable Stg

4.43 da

1.6 da

Revised -

Added operating cost 2da - 3da/da

1. OT Labor (16hr/wk @ 16)

16 x 52 x 12 x 3705 = 1.23

+

5,667/yr

2 Extra switching

@ 17.52/da x 3 x 365

17,513

3 Holiday, Sunday, switching

52 x 12 x 3705 = 1.23

32,926

4. Extra Labor - Pump cap -

59,136

Case I Now

Storage Col 176,500 gal —

Capital

unit cost 3

Case II Exp

Case III - 277 M Gal - 306 M #/yr

Storage Col 176,500 gal —

Present Situation

Use 1.72 cars/day = 12 cars/wk

Storage 5.5 cars or 2.2 days Storage

Car Unloading
Capacity 2 cars/hr
3 cars/hr

Docks - 3 spots

Projected

Use $\overline{AV}$ 3.05 cars/day 24 cars/wk at
May 3.80 26.4 cars/wk max.

Storage 15.04 4.36 days 443 mg.

Car unloading 5 cars/hr

Docks 5 spots

3.80 42 wks = 9150

4 x 8

1 1/2 9

10

545

3 4/5

171

633

11,550

Minimum Capital

Storage 5.5 cars 1.59 days

Unloading 2 cars/hr 2 shift 12 hrs 6 days/wk

Docks 4 + spots

Extra operating cost

Run comparison + 30M
run 20M
250M

$$\begin{array}{r} 300,000 \\ - 50,000 \\ \hline \end{array}$$

$$250,000 M - \times 1.14\% \\ / 15 \text{ days}$$

$$\begin{array}{r} 35,000 \\ - 16,700 \\ \hline \end{array}$$

51,700 cost savings

Increased costs

- 1 Switching 6 Hdd days $\times 575/\text{switch}$ $\times 3,500$
 - 2 Labor $\left\{ 11550 \times 2 \times \frac{55}{3.45} - 11550 = \right\} 11,950$
 - 3 $\left\{ - 2 \times 52 \times 9 \times 1.5 + 555 = \right\} 6,930$
- \$22,380

7th day cost when not more use of 22.6 cur/h

Switch 575

Labor

139

Sundown Pumping

$$717 \times 6$$

$$= 4302$$

Depreciation - 60.40 in 90k with supply

3.58 days

If we have 1.58 (14 days)

2.0 - 3.4

$$7.2200 \times 26,900$$

160,000g