

PARSONS ENGINEERING SCIENCE, INC.

MEMORANDUM

November 16, 1995

To: Dan Greyuski  
From: Rich Maurer, Engineering Task Manager  
Subject: SANTA ROSA SUBREGIONAL LONG-TERM WASTEWATER PROJECT  
TIME TO INSTALL PIPELINES

723129.31001

=====

In response to your request, I have prepared the following summary of information needed to determine the time to install the larger diameter sections of pipelines for each alternative project.

Pipelines requiring more than 30 calendar days (ie, 21 working days) to install one mile of length (ie, at a rate of less than 250 ft per working day) are pipeline sections 30" diameter and larger.

30 calendar days = about 21 working days

5,280 feet

----- = 250 ft installed per working day

21 days

The approximate total length of pipelines of diameters 30" to 60", their installation rate, and the working days and calendar days necessary to install one mile of length, by project alternative, are as given in Table 1.

The total length of larger diameter piping (ie, 30" and larger) per alternative project are given in Table 2.

For a given piping size for a given project, the time (in working days) to install the piping can be determined by dividing the length of that size by the installation rate for that size. The time in calendar days can then be obtained by multiplying by 7/5.

The larger diameter pipelines take longer to install because of the larger volume of trench material to excavate, the larger volume of backfill to place, the heavier and more unwieldy sections of pipe to handle, the longer time needed to weld the larger diameter pipe sections, the more complicated traffic control and safety measures, the more complicated material delivery scheduling procedures, etc.

Please note, in order to limit the overall construction time for a project to a reasonable total period (2 to 3 years) it is necessary to assume that 4 work crews will be engaged simultaneously (at different locations) for any of the Alternative 2 or 3 projects, 3 crews for the Alternative 4 project, and one crew for the Alternative 5A project. The number of crews could be reduced if the contractors work more than the assumed 10 hours per day, or more than 5 days per week.

**TABLE 1 - TIME TO INSTALL PIPELINES WHICH REQUIRE MORE THAN 30 CALENDAR DAYS PER MILE OF PIPE  
(IE, 30" AND LARGER)**

Alternative	Diameter (inches)	Installation Rate (feet/day)	Time to Install One Mile of Pipe	
			Working Days (days) (1)	Calendar Days (days) (2)
2 and 3	30	250	21	30
	36	225	24	33
	42	200	27	38
	48	170	31	44
	54	145	36	51
	60	115	46	65
4	42	100 (3)	53	74
	48	170	31	44
5A	48	170	31	44
	54	145	36	51

(1) Based on 10 hours per workday.

(2) Based on 5 working days per week.

(3) This installation rate is 50% the rate used in Alternatives 2 and 3 due to the restricted right-of-way and the number of bends along Pine Flat Road.

TABLE 2 - TOTAL LENGTH OF LARGER DIAMETER PIPING PER ALTERNATIVE PROJECT  
(30" AND LARGER)

Alternative	Total Length of Pipeline by Size (feet)					
	Pipeline Size (inches)					
	30	36	42	48	54	60
2A	18,300	21,920	12,400	152,320	10,900	6,020
2B	54,400	20,420	16,600	101,360	0	0
2C	21,800	23,720	12,400	107,520	0	19,720
2D	17,400	55,220	5,300	122,220	32,300	0
2E	18,300	40,620	108,520	26,900	6,020	0
3A	27,200	15,420	0	80,200	0	7,400
3B	27,150	15,820	6,000	42,200	34,800	0
3C	25,450	15,820	37,000	38,000	0	21,400
3D	26,600	15,820	37,000	37,650	0	21,400
3E	16,000	51,820	16,150	61,400	0	0
3F	27,150	24,420	51,000	23,620	5,200	7,400
4	-	-	70,000	117,000	-	-
5A	-	-	-	13,000	26,000	-

Note: All Alternative 2 and 3 projects include piping for Sebastopol irrigation.