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MOKELUMNE RIVER FISH INSTALLATION,
ANNUAL REPORT FOR 1977-78 SEASON WITH
AN ADDENDUM TO THE 1976-77 REPORT

by

Philo F. Jewett
Region 2, Inland Fisheries

Anadromous Fisheries Branch
Administrative Report No. 80-9

1980

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ABSTRACT

This report describes the operation of the Mokelumne River Fish Installation from July 1, 1977 through June 30, 1978. The installation consists of a spawning channel, hatchery, and rearing ponds.

Because of a severe drought, adult chinook (king) salmon, Oncorhynchus tshawytscha, were unable to migrate up the Mokelumne River. We received a total of 769,476 eggs and fingerlings from Nimbus and Feather River hatcheries, and released 163,186 fingerlings during the 1977-78 season. Water quality problems caused heavy mortalities and disrupted operating schedules.

We released 8,237 steelhead trout, Salmo gairdneri, as yearling catchables, and received 20,125 eggs.

^{1/} Anadromous Fisheries Branch Administrative Report No. 80-9.
Submitted 1980.

INTRODUCTION

This is the 14th annual report for the Mokelumne River Fish Installation. It covers the period of operation from July 1, 1977 through June 30, 1978. Copies of previous annual reports are available upon request from the Anadromous Fisheries Branch, Rancho Cordova.

The Mokelumne River Fish Installation is located on the south bank of the Mokelumne River at the base of Camanche Dam in San Joaquin County. Camanche Dam is presently the upper limit of anadromous fish migration in the river. The Mokelumne River enters the San Joaquin River about 98 river km (61 miles) downstream from the dam.

The installation was constructed to compensate for the loss of fall-run chinook salmon and steelhead trout spawning and rearing areas blocked by Camanche Dam. It is operated by the California Department of Fish and Game. The East Bay Municipal Utility District paid construction costs and also pays the annual operating and maintenance costs.

The installation is made up of two parts: (1) a spawning channel for natural spawning and rearing of fall-run chinook salmon, and (2) hatchery and rearing pond facilities for artificial spawning and rearing of steelhead and salmon. A detailed description of the facility appears in the first annual report (Groh 1965).

During winter 1977-78 half of the first loop of the spawning channel was converted to three 152 m (500 ft) rearing ponds as part of the drought emergency salmon maintenance program. These ponds had a capacity of one million yearling chinook salmon.

WATER TEMPERATURES

Water temperatures were recorded continuously throughout the reporting period near the spawning channel entrance. Maximum and minimum recorded temperatures were 20.0°C (68°F) and 8.9°C (48°F), respectively (Appendix).

COPPER AND ZINC ANALYSIS

This was the third year in which copper and zinc concentrations in the Mokelumne River became high enough to cause significant mortalities of juvenile fish. The highest concentrations of zinc reached 0.67 ppm on January 23, 1978 (Appendix).

DISEASE

We had no significant disease problems this year.

PUBLIC RELATIONS

During the 1977-78 year, an estimated 16,000 people visited the installation. Tours were conducted for many special interest groups, and talks were given to sportsman clubs and civic organizations.

PRODUCTION SUMMARY

Because of the drought there was no natural production for the first time in the history of the installation. Nearly 1 million chinook salmon eggs and fingerlings were received from other facilities and raised for stocking in the Mokelumne River (Table 1).

TABLE 1. Production Summary, Mokelumne River Fish Installation, 1977-78

Species	Number of adults received	Estimated egg deposition	Number of eggs received	Number of fingerlings received	Number of fingerlings planted	Number of yearlings planted	On hand 6/30/78
Chinook salmon	0	0	397,030	572,426	163,186*	0	501,550
Steelhead	0	0	0	20,125		8,237	19,000

* Fall 1977.

CHINOOK SALMON MAINTENANCE

History of the 1977 Run

Because of the drought, adult salmon were unable to migrate up the Mokelumne River.

Production

The 104,000 1976 broodyear (BY fingerlings on hand July 1, 1977 were supplemented by 85,176 fingerlings received from Nimbus Hatchery later in July (Table 2). These fish were planted during fall 1977.

TABLE 2. Chinook Salmon Eggs and Fingerlings Received, Mokelumne River Fish Installation, 1977-78

	Broodyear	Date	Number received	Origin
Fingerlings	1976	July 1977	85,176	Nimbus Hatchery (American River)
Eggs	1977	December 1977	200,020	Nimbus Hatchery
		January 1978	180,000	Feather River Hatchery
		April 1978	17,010	Feather River Hatchery
Fingerlings	1977	May 1978	93,800	Feather River Hatchery
		June 1978	393,450	Feather River Hatchery

We received 197,010 1977 BY chinook eggs from Feather Hatchery, but most of the resulting fingerlings were killed by the zinc and hydrogen sulfide pollution. The remaining 1977 BY fingerlings were augmented by 487,250 fingerlings received from Nimbus and Feather River Hatcheries.

Planting 1976 BY Chinook Salmon

We planted 163,186 1976 BY chinook salmon fingerlings in fall 1977 (Table 3).

TABLE 3. Chinook Salmon Planting Summary, Mokelumne River Fish Installation, 1977-78

Date	Area	Number	Size	Mark
8/30/77	Mokelumne River	32,400	36/lb	
9/ 8/77	Rio Vista	42,570	30/lb	
9/30/77	Brannon Island	32,915	15/lb	Ad+CWT
9/30/77	Brannon Island	2,801	15/lb	Ad+CWT
10/ 3/77	Brannon Island	18,000	15/lb	
10/ 4/77	Brannon Island	34,500	15/lb	

Chinook Salmon Tagging Program

Phase 2 of the yearling evaluation was scheduled with the release of two groups of 45,000 Ad-CWT fish to determine the difference in returns of upstream and downstream releases. With the onset of the heavy metal pollution in September, tagging was discontinued and the fish planted at Brannon Island, the nearest planting site with suitable water conditions. Phase 2 was to be conducted as soon as conditions improved.

STEELHEAD PROGRAM

The steelhead brood stock program was terminated in 1976. Beginning in 1977 we received surplus steelhead eggs or fingerlings from Nimbus Hatchery, raise them to yearling size and plant them in the Mokelumne River to provide a catchable trout fishery.

On July 1, 1977 we had 11,900 1976 BY, and 22,300 1977 BY steelhead on hand. Of these, 8,237 1976 BY were released on a catchable trout basis throughout the season; the remaining 28,373 died because of the previously discussed water quality problem.

In June 1978, we received 20,125 1977 BY steelhead fingerlings from the Feather River Hatchery; 19,000 were on hand June 30, 1978.

1976-77 ADDENDUM

The 1976-77 annual report (Jewett 1979) did not include some of the fingerling fish transfers that had occurred (Table 4).

TABLE 4. Summary of Hatchery and Rearing Pond Operations,
Mokelumne River Fish Installation, 1976-77

Species	Brood year	Date received	Number received	Origin	Number planted	Number on hand 6/30/77
Chinook salmon	1976	1/18/77	201,000	Nimbus Hatchery		
	1976	2/16/77	100,050	Nimbus Hatchery		
TOTALS			301,050		80,000*	140,000
Steelhead	1976	7/ 1/76 ⁺	72,000	Nimbus Hatchery	51,752	11,900
	1977	2/16/77	30,300	Nimbus Hatchery		22,300

* Released in the spawning channel
+ Carryover.

Most (47,700) of the planted steelhead were released in January 1977. The other 4,052 were released in small lots to provide a catchable trout fishery.

REFERENCES

- Groh, Frederick H. 1965. Annual report Mokelumne River Fish Installation from January 1, 1964 to June 30, 1965. Calif. Dep. Fish and Game, Inland Fish. Admin. Rep. 65-21. 28 p.
- Jewett, Philo F. 1979. Mokelumne River Fish Installation annual report for 1976-77 season. Calif. Dep. Fish and Game, Anad. Fish. Br. Admin. Rep. 79-4. 13 p.

APPENDIX TABLE 1. Chinook Salmon Production Summary, Mokelumne River Fish Installation, 1966-67 through 1977-78

Season	Number handled			Number of females released in channel	Female prespawning mortality	Estimated egg deposition	Number of eggs received	Fingerling production	Yearling production
	Total	Volunteer	Trapped ^{a/}						
1964-65	362	242	120	178	3	927,300		73,540	
1965-66	173	173	0	33	1	150,883		76,435	
1966-67	489	293	196	85	4	387,562		76,796	
1967-68	250	250	0	93	0	487,220		177,542	
1968-69	954	565	389	159	38	557,326		37,866	
1969-70	615	296	319	314	77	1,164,430		497,130	
1970-71	925	377	548	305	36	1,328,178		564,670	
1971-72	1,291	366	925	539	183	1,900,022		560,506 ^{b/}	
1972-73	353	353	0	30	0	137,006		40,417 ^{b/}	
1973-74	408	408	0	128	21	597,342	100,800	176,216 ^{b/}	
1974-75	220	220	0	37	5	144,566	101,640	7,216 ^{d/}	54,948 ^{c/}
1975-76	399	399	0	81	2	378,641	197,500	68,070 ^{d/}	49,542
1976-77	74	74	0	6	0	27,533	301,050	71,280 ^{f/}	51,855
1977-78	0	0	0	0		0	969,456 ^{e/}	163,186 ^{f/}	

- ^{a/} Trapped at Woodbridge Dam and trucked to the installation.
^{b/} Calculated from average production for year 1964-65 through 1970-71.
^{c/} Included 12,788 yearlings which failed to migrate the previous year.
^{d/} Minimum estimate. Trap was not in place during one week of emigration.
^{e/} Includes 397,030 eggs plus 572,426 fingerlings.
^{f/} Planted in fall 1977.

APPENDIX TABLE 2

Water Temperatures and Zinc Concentrations,
Mokelumne River Fish Installation, 1977-78 Season

Date	Water temperature (C)		Zinc μ /ppm		Date	Water temperature (C)		Zinc μ /ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
July 1	15.6	15.0	.01		Aug. 1	17.2	16.7	.01	
2	15.6	15.0	.02		2	17.2	16.7	.01	
3	15.6	15.0	.01		3	17.2	16.7	.01	
4	15.6	15.0	.01		4	17.2	16.7	.01	
5	15.6	15.0	.01		5	17.2	16.7	.01	
6	15.6	15.0	.01		6	16.7	16.7	.01	
7	15.6	15.0	.01		7	16.7	16.7	.01	
8	15.6	15.0	.01		8	17.2	16.7	.01	
9	15.6	15.0	.01		9	17.2	16.7	.02	
10	16.1	15.0	.01		10	17.2	16.7	.02	
11	16.1	15.0	.01		11	17.2	16.7	.15	
12	16.1	15.6	.01		12	17.2	16.7	.01	
13	16.1	15.6	.01		13	17.2	16.7	.02	
14	16.1	15.6	.01		14	17.2	16.7	.01	
15	16.1	15.6	.01		15	17.7	17.2	.01	
16	16.1	15.6	.01		16	17.7	17.2	.01	
17	16.1	15.6	.01		17	17.2	17.2	.01	
18	16.1	15.6	.01		18	17.2	16.7	.01	
19	16.1	15.6	.01		19	17.7	17.2	.01	
20	16.7	15.6	.02		20	17.7	17.2	.01	
21	16.7	15.6	.01		21	17.7	17.2	.01	
22	16.7	15.6	.01		22	17.7	17.2	.01	
23	16.7	15.6	.01		23	17.7	17.2	.01	
24	16.7	15.6	.12		24	17.7	17.7	.01	
25	16.7	15.6	.01		25	17.7	17.2	.01	
26	16.7	16.1	.01		26	17.7	17.7	.01	
27	16.7	16.1	.01		27	17.7	17.7	.01	
28	16.7	16.1	.01		28	18.3	17.7	.01	
29	17.2	16.1	.01		29	18.3	17.7	.02	
30	17.2	16.1	.01		30	18.3	17.7	.04	
31	17.2	16.7	.01		31	18.3	17.7	.02	

APPENDIX TABLE 2 (continued)

Water Temperatures and Zinc Concentrations,
Mokelumne River Fish Installation, 1977-78 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Sept. 1	18.3	17.7	.02		Oct. 1	19.4	18.3	.02	.02
2	17.3	17.7	.02		2	18.3	18.3	.02	.02
3	18.8	17.7	.02		3	19.4	18.3	.02	.03
4	18.8	17.7	.03		4	19.4	18.3	.02	.02
5	18.8	18.3	.02		5	18.3	17.2	.02	.02
6	18.8	18.3	.02		6	18.3	17.2	.04	.12
7	18.8	18.3	.03		7	17.7	16.7	0.2	.03
8	19.4	18.8	.02		8	17.7	17.2	.01	.07
9	18.8	18.8	.02		9	18.3	17.3	.03	.02
10	18.8	18.8	.02		10	17.7	17.2	.16	.05
11	18.8	18.3	.02		11	18.3	17.2	.02	
12	18.8	18.3	.02		12	18.3	17.7	.02	
13	18.8	18.3	.02		13	18.3	17.2	.02	
14	18.8	18.3	.02		14	18.3	17.2	.02	
15	18.8	18.3	.06		15	18.3	17.2	.01	
16	18.8	18.3	.10		16	17.7	17.2	.01	
17	19.4	18.3	.02		17	17.7	17.2	.01	
18	19.4	18.3	.01		18	17.7	17.2	.01	
19	19.4	18.8	.02		19	17.7	17.2	.01	
20	19.4	18.3	.02		20	17.7	17.2	.03	
21	19.4	18.8	.01		21	17.7	17.2	.01	
22	19.4	18.8	.03		22	17.7	17.2	.02	
23	19.4	18.8	.03	.02	23	17.7	17.2	.01	
24	20.0	18.8	.02	.13	24	17.7	17.2	.01	
25	20.0	18.8	.02	.07	25	17.7	17.2	.11	
26	20.0	18.8	.02		26	18.3	17.2	.02	
27	20.0	18.8	.01		27	17.7	17.2	.01	
28	18.8	18.8	.03	.02	28	17.7	17.2	.01	
29	19.4	18.3	.03		29	17.7	17.2	.01	
30	18.8	18.3	.03	.02	30	17.7	17.2	.01	
					31	17.7	17.2	.02	

APPENDIX TABLE 2 (continued)

Water Temperatures and Zinc Concentrations,
Mokelumne River Fish Installation, 1977-78 Season.

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Nov. 1	17.7	17.2	.01		Dec. 1	13.9	13.3	.01	.01
2	17.7	17.2	.01		2	13.3	13.3	.01	.01
3	17.7	17.2	.01		3	13.3	13.3	.02	.01
4	17.2	17.2	.01		4	13.3	13.3	.01	
5	17.2	17.2	.01		5	13.3	13.3	.02	.02
6	17.2	16.7			6	13.3	13.3	.01	
7	17.2	16.7			7	13.3	12.8	.01	.04
8	17.2	16.7	.01		8	12.8	12.8	.01	.02
9	17.2	16.7	.01		9	12.8	12.8	.01	.03
10	16.7	16.7	.01		10	12.8	12.2	.04	
11	16.7	16.1	.01		11	12.2	12.2	.02	.01
12	16.7	16.1	.01		12	12.2	12.2	.01	
13	16.7	16.1	.02	.01	13	12.2	12.2	.02	.01
14	16.7	16.1	.01		14	12.2	12.2	.09	.01
15	16.6	15.6	.01		15	12.2	12.2	.02	.01
16	16.1	15.6	.01	.01	16	12.2	12.2	.02	.03
17	15.6	15.6	.01	.01	17	12.2	11.7	.01	.01
17			.01		18	11.7	11.1	.01	.03
18	15.6	15.0	.01	.01	19	11.7	11.1	.01	
18				.01	20	11.7	11.7	.01	.07
19	15.6	15.0	.01		21	11.7	11.7	.03	
20	15.0	15.0	.01		21			.01	
21	15.0	14.4	.01		22	11.7	11.1	.01	
22	14.4	13.9	.01		23	11.7	11.1	.02	.02
23	13.9	13.9	.01	.02	24	11.7	11.1	.01	.01
24	13.9	13.9	.05	.05	25	11.1	11.1	.01	.01
25	13.9	13.3	.02	.01	26	11.1	11.1	.01	.01
26	13.9	13.3	.02		27	11.1	11.1	.02	.01
27	13.3	13.3	.02		28	11.1	11.1	.01	.01
28	13.3	13.3	.01	.01	29	11.1	11.1	.01	.01
29	13.9	13.3	.01	.02	30	11.1	11.1	.01	.01
30	13.9	13.3	.01	.02	31	11.1	11.1	.02	.01

APPENDIX TABLE 2 (continued)

Water Temperatures and Zinc Concentrations,
Mokelumne River Fish Installation, 1977-78 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
Jan. 1	11.1	11.1	.01	.01	Feb. 1	10.6	10.0	.21	.14
2	11.1	11.1	.01	.01	2	10.6	10.0	.17	.25
3	11.1	11.1	.01	.01	3	10.6	10.0	.17	.25
4	11.1	11.1	.04	.01	4	10.6	10.0	.19	.17
4			.01	.01	5	10.6	10.0	.15	.15
5	11.1	11.1	.01	.01	6	10.6	10.0	.15	.17
6	11.1	11.1	.01	.01	7	10.6	10.0	.15	.15
7	11.1	11.1	.02	.01	7			.14	.13
8	11.1	11.1	.01	.02	8	10.6	10.0	.13	.13
9	11.1	11.1	.01	.01	8			.13	.14
10	11.1	11.1	.01	.01	9	10.6	10.0	.13	.12
11	11.1	11.1	.01	.01	9			.12	.12
12	11.1	11.1	.01	.03	10	10.6	10.0	.07	.12
13	11.7	11.1	.01	.01	10			.10	.16
14	11.7	11.1	.01	.02	11	10.6	10.0	.20	.15
15	11.7	11.1	.03	.01	12	10.0	10.0	.16	.15
16	11.1	11.1	.01	.01	13	10.0	10.0	.15	.14
17	11.1	11.1	.01	.01	14	10.0	10.0	.14	.14
17			.01	.01	15	10.0	10.0	.17	.14
18	11.1	11.1	.01	.01	16	10.0	10.0	.17	.17
18			.01		17	10.0	10.0	.24	.18
19	11.1	11.1	.01	.02	18	10.0	10.0	.17	.20
20	11.1	11.1	.01	.01	19	10.0	10.0	.20	.18
21	11.1	11.1	.10	.01	20	10.0	10.0	.19	.20
22	11.1	11.1	.19	.33	21	10.0	10.0	.22	.21
23	11.1	10.6	.42	.53	22	9.4	9.4	.21	.22
23			.43	.50	23	9.4	9.4	.20	.21
23			.44	.67	24	9.4	9.4	.27	.17
23			.38	.36	25	9.4	8.9	.17	.16
24	10.6	10.6	.30	.19	26	9.4	8.9	.16	.16
24			.24	.19	27	9.4	8.9	.15	.15
24			.22		28	9.4	8.9	.15	.15
25	10.6	10.6	.25	.28					
25			.26	.28					
25			.25	.28					
26	10.6	10.6	.22	.25					
26			.22	.23					
26			.22	.23					
27	10.6	10.6	.22	.24					
28			.23	.25					
29	10.0	10.0	.24	.24					
30	10.0	10.0	.22	.22					
31	10.0	10.0	.20	.20					

APPENDIX TABLE 2 (continued)

Water Temperature and Zinc Concentrations,
Mokelumne River Fish Installation, 1977-78 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
March					April				
1	10.6	9.4	.15	.14	1	10.0	10.0	.16	.15
2	10.6	8.9	.14	.13	2	10.0	10.0	.13	.15
3	11.1	9.4	.13	.15	3	10.0	10.0	.13	.17
4	12.2	11.1	.10	.16	4	10.0	10.0	.16	.15
5	11.6	10.6	.11	.11	5	10.0	10.0	.15	.14
6	11.1	10.0	.11	.11	6	10.0	10.0	.14	.14
7	11.1	10.6	.11	.12	7	10.6	10.0	.14	.14
8	10.6	10.0	.18	.12	8	10.6	10.0	.12	
9	10.0	10.0	.10	.14	9	11.1	10.0	.14	.13
10	10.0	10.0	.14	.15	10	11.1	10.0	.13	.14
11	10.0	10.0	.15	.20	11	11.1	10.0	.17	.17
12	10.0	10.0	.20	.30	12	11.1	10.6	.13	.13
13	10.0	10.0	.18		13	10.6	10.0	.13	.13
14	10.0	10.0	.12	.19	14	10.6	10.0	.15	.13
15	10.0	10.0	.19		15	10.6	10.6	.13	
16	10.0	10.0	.19	.20	16	10.6	10.0	.15	.14
17	10.0	10.0	.19	.19	17	10.6	10.0	.14	.13
18	10.0	10.0	.17	.16	18	10.6	10.6	.13	.14
19	10.0	10.0	.18	.18	19	10.6	10.6	.23	.12
20	10.0	10.0	.19	.19	20	10.6	10.6	.12	.14
21	10.0	10.0	.19	.18	21	11.1	10.6	.13	.13
22	10.6	10.0	.18	.19	22	11.1	10.6	.13	
23	10.6	10.0	.19	.18	23	11.1	10.6	.15	
24	10.6	10.0	.18	.17	24	11.1	10.6	.15	.13
25	10.6	10.0	.19	.19	25	11.1	10.6	.13	.14
26	10.6	10.0	.19	.18	26	11.1	10.6	.13	.15
27	10.6	10.0	.18	.18	27	11.1	10.6	.11	.10
28	10.6	10.0	.16	.16	28	11.1	10.6	.12	.12
29	10.0	10.0	.16	.16	29	11.1	10.6	.11	
30	10.0	10.0	.15	.15	30	11.1	10.6	.13	
31	10.0	10.0	.16						

APPENDIX TABLE 2 (continued)

Water Temperature and Zinc Concentrations,
Wokelumne River Fish Installation, 1977-78 Season

Date	Water temperature (C)		Zinc ppm		Date	Water temperature (C)		Zinc ppm	
	Max.	Min.	a.m.	p.m.		Max.	Min.	a.m.	p.m.
May 1	11.1	10.6	.10	.10	June 1	12.8	12.2	.04	.04
2	11.1	10.6	.09	.08	2	12.8	12.2	.04	.04
3	11.1	10.6	.09	.12	3	12.8	12.2	.04	.05
4	11.1	10.6	.08	.09	4	12.8	12.2	.04	.04
5	11.1	10.6	.08	.08	5	12.8	12.2	.05	.05
6	11.1	10.6	.09	.07	6	12.8	12.2	.04	.04
7	11.7	11.1	.08	.08	7	12.8	12.2	.04	.04
8	11.7	11.1	.08	.09	8	12.8	12.2	.04	.04
9	12.2	11.1	.06	.08	9	12.8	12.2	.04	.04
10	11.7	11.1	.06	.06	10	12.8	12.2	.04	.04
11	11.7	11.1	.06	.08	11	12.8	12.2	.04	.04
12	12.2	11.1	.06	.08	12	12.8	12.2	.04	.04
13	12.2	11.1	.06	.06	13	12.8	12.2	.04	.05
14	12.2	11.1	.05	.05	14	12.8	12.2	.07	.04
15	12.2	11.1	.06	.06	15	12.8	12.2	.05	.06
16	12.2	11.1	.06	.06	16	12.8	12.2	.04	.04
17	12.2	11.1	.05	.06	17	12.8	12.2	.04	.10
18	12.2	11.1	.06	.06	18	12.8	12.2	.03	.06
19	12.2	11.1	.05	.05	19	12.8	12.2	.04	.06
20	12.2	11.1	.05	.06	20	12.8	12.2	.05	.06
21	12.2	11.1	.05	.05	21	13.3	12.2	.03	.04
22	12.2	11.1	.12	.05	22	13.3	12.2	.04	.05
23	12.2	11.1	.15	.06	23	13.3	12.2	.04	.03
24	12.2	11.1	.08	.04	24	13.3	12.2	.10	.05
25	12.2	11.1	.06	.05	25	13.3	12.2	.05	.04
26	12.2	11.1	.06	.07	26	13.3	12.2	.03	.04
27	12.2	11.1	.05	.04	27	13.3	12.2	.03	.04
28	12.8	11.7	.05	.05	28	13.3	12.2	.04	.04
29	12.8	11.7	.05	.08	29	13.3	12.2	.04	.05
30	12.8	11.7	.04	.04	30	15.3	12.2	.11	.09
31	12.8	11.7	.04	.05					