FAXED

J.R. Wood Inc.
7916 W. Bellevue Rd.
Atwater, Ca 95301

MAR 0 1 2001

facsimile transmittal

To:	Robert Pooler	**Fax:**	202-205-7808
From:	Trudy Finn	**Date:**	03/01/01
Re:	Petition	**Pages:**	30
CC:	Kim Burton		

Urgent **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Dear Mr. Pooler,

Attached is the first part of a petition to amend the prohibition against using Caustic Potash (potassium hydroxide) for peeling organic peaches during the production of IQF (Individual Quick Frozen) organic peaches. Supporting documents in excess of 100 pages are in route to you via Fed Ex.

Please forgive us if we have overlooked anything in this process. There is little to go by for format. It is important that this is on file as we are attempting to get this issue on the agenda for the June NOSB meeting. Please contact Trudy Finn at the JR Wood if you require any additional information.

209-358-5643 ext. 217 or trudy@jrwood.com

Received by OMRI

MAR 15 2001

FAXED

MRT 0 1 2001

March 1, 2001

Petition for the evaluation to amend the use of Potassium Hydroxide

Category: Synthetic

1. Substance common name: Caustic Potash – KOH

2. Manufacture's information: Occidental Chemical
5005 LGJ Freeway
Dallas, TX 75244
1-972-404-3800

3. Intended and current use: Processing Aid for Peeling Peaches

4. Substance's mode of action: Freezers use Potassium Hydroxide in the following Way. Potassium Hydroxide is diluted in water to create a solution of 4 to 7% for Freestone peaches and 2 to 4% for cling peaches. The solution is cascaded onto the peaches in a 190° F environment. The peaches are showered not soaked. The peaches then enter a Magnusson scrubber where the skin is removed by brushing and fresh water rinsing. The fresh water rinsing further dilutes the Potassium Hydroxide on the skin of the peach. The skin is removed for disposal.

5. Manufacturing Process: Potassium Chloride (salt) + water + electricity = Potassium Hydroxide.

6. Previous reviews: COFAB advisory board has reviewed and made no decision. CDFA has allowed its use as a processing aide for the past several years. Ray Green from CDFA indicated that Caustic Potash (Potassium Hydroxide) met the criteria as outlined by OPTHA. QAI has certified its use in the processing of IQF peaches since 1998. OTCO has included it since 1999. See attached certifications.

7. EPA, FDA, and State regulatory registration: N/A

8. CAS Number and label info: CAS # 7732-18-5 water CAS # 1310-58-3 (KAH), Label # 0198M31866

9. Substance's physical properties and mode of action: See attached water report.

10. Material Data Sheet: Attached

11. Research Information: Attached

12. Justification Statement: Attached

Received by OMRI

MAR 15 2001

"Petition Justification statement"

Caustic Potash should be allowed as a processing aid to peel peaches during the production of IQF (Individually Quick Frozen) organic peaches. There is simply no alternative, organic or otherwise that will produce finished product in accordance with well established industry specifications and consumer expectations.

Currently Caustic Potash (Potassium Hydroxide) is on the National list as a processing aid "except for the peeling of fruits and vegetables." This prohibition against peeling on all fruits and vegetables is too broad and ignores the significant physical differences between commodities as well as their end use markets. We agree that most vegetables and tomatoes can be steam peeled. We also acknowledge that there are mechanical methods for peeling apples and pears. However there is no method for Organic peaches.

J.R. Wood, Inc. along with other interested parties have aggressively tested many different methods for peeling peaches since 1988. All have failed. J.R. Wood, Inc. has successfully lowered the percentage of Caustic Potash required in a hot water solution while maintaining an effective peeling process.

J.R. Wood, Inc. has also demonstrated that there is no residual in the finished product. In addition those fruit processors who treat their own wastewater instead of dumping to a municipal treatment system derive a benefit from the residual in the waste stream. Processors who treat their own wastewater are required by state government to restore the wastewater to its original EC and BOD ratings prior to returning for use. Fruit by its nature has a high acid content. Water used in processing fruit becomes acidic. The Caustic Potash present in the water helps lower the acidity. The Caustic Potash contributes a small counterbalance but it does reduce the need for other chemical treatment to restore the water to its original EC.

After twelve years of trying to find an alternative, it is time to amend the prohibition against peeling for IQF peaches. After reviewing the accompanying research I am confident you will act to amend prohibition on the materials list.

Respectfully submitted by J.R. Wood, Inc.

J.R. WOOD INCORPORATED
P.O. Box 545
Atwater, CA 95301

F A X C O V E R S H E E T

DATE:	June 26, 1997	TIME:	2:30 PM
TO:	Yvonne Frost Oregon Tilth	PHONE: FAX:	(503) 620-2829 (503) 624-1386
FROM:	Danny Galatro DG J.R. Wood, Inc.	PHONE: FAX:	(209) 358-5643 x227 (209) 358-9701
RE:	Organic IQF Peaches		
CC:			

Number of pages including cover sheet: 7

Message

Ron O'Bara thought that you should receive a copy of this letter for your reference. It has been sent to Jack Bojorques and Ojai Organics.

Also, I am in the process of sending you baby food labels for Organic Baby and Mom's Organic Choice. Be expecting them in the mail early next week.

FAXED
6-26-97

RODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

JR WOOD, INC.
7916 W BELLEVUE ROAD
PLANT 2

ATWATER ,CA 95301 ,

AN WATERS & ROGERS INC. , A ROYAL VOPAK COMPANY (425)889-3400
100 CARILLON POINT , KIRKLAND , WA 98033

---------- EMERGENCY ASSISTANCE ----------

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9300

RODUCT NAME:
AUSTIC POTASH-LIQUID (ALL GRADES)

SDS #: OC31866

. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS NUMBER : M31866 ISSUE DATE : 10/19/98

PRODUCT NAME : CAUSTIC POTASH-LIQUID (ALL GRADES)

MANUFACTURER'S NAME AND ADDRESS : OCCIDENTAL CHEMICAL CORPORATION, OCCIDENTAL TOWER
5005 LBJ FREEWAY, P.O. BOX 809050
DALLAS, TX 75380 (972) 404-3800

24 HOUR EMERGENCY TELEPHONE : 1-800-733-3665 OR 972-404-3228

TO REQUEST AN MSDS : 1-800-699-4970

CUSTOMER SERVICE : 1-800-752-5151

PRODUCT USE : GLASS MANUFACTURE, INDUSTRIAL CLEANERS, CHEMICAL PROCESSES, PETROLEUM INDUSTRY

CHEMICAL NAME : POTASSIUM HYDROXIDE

PRODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

CHEMICAL FORMULA : KOH

SYNONYMS/COMMON NAMES : KOH
LIQUID POTASH

2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS NUMBER / NAME
7732-18-5 WATER

EXPOSURE LIMITS
PEL:NOT ESTABLISHED
TLV:NOT ESTABLISHED

PERCENTAGE
VOL ND
WT 49-90

COMMON NAMES:

LISTED ON(LIST LEGEND BELOW):
00 19 22 23 50 51

- -

1310-58-3 POTASSIUM HYDROXIDE (KOH)

EXPOSURE LIMITS
PEL:2 MG/M3, CEILING
TLV:2 MG/M3, CEILING

PERCENTAGE
VOL ND
WT 10-51

COMMON NAMES:
CAUSTIC POTASH
KOH

LISTED ON(LIST LEGEND BELOW):
00 13 18 21 22 50 51

- -

LIST LEGEND
00 TSCA INVENTORY
13 PA ENVIROMENTAL HAZ SUBSTANCE
18 NY HAZARDOUS SUBSTANCES
19 PA REQUIREMENT- 3% OR GREATER
21 NJ SPECIAL HEALTH HAZ SUB
22 CANADIAN DOMESTIC SUB LIST
23 NJ REQUIREMENT- 1% OR GREATER
50 PHILIPPINES INVENTORY (PICCS)
51 EINECS

3. HAZARDS IDENTIFICATION

********** EMERGENCY OVERVIEW **********
*
* MAY CAUSE BURNS TO THE EYES, SKIN, AND MUCOUS MEMBRANES. MAY *
* CAUSE PERMANENT EYE DAMAGE. INHALATION OF DUST, MIST, OR SPRAY *

RODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

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* CAN CAUSE SEVERE LUNG DAMAGE. CAN REACT VIOLENTLY WITH WATER, ACIDS AND OTHER SUBSTANCES.

* CLEAR LIQUID WITH NO DISTINCT ODOR

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY:
INHALATION, INGESTION.

TARGET ORGANS:
EYES, SKIN, RESPIRATORY TRACT, GASTROINTESTINAL TRACT.

IRRITANCY:
LIQUID, VAPORS OR MIST MAY BE IRRITATING TO EYES, SKIN AND RESPIRATORY TRACT.

SENSITIZING CAPABILITY:
NONE KNOWN.

REPRODUCTIVE EFFECTS:
NONE KNOWN.

CANCER INFORMATION:
NONE KNOWN.

SHORT-TERM EXPOSURE (ACUTE)

INHALATION:
EXPOSURE TO VAPOR, MIST OR LIQUID CAN PRODUCE BURNS OF THE RESPIRATORY TRACT.

SEVERE EXPOSURES COULD RESULT IN CHEMICAL PNEUMONIA.

EYES:
CONTACT CAN CAUSE SEVERE DAMAGE INCLUDING BURNS AND BLINDNESS.

THE SEVERITY OF THE EFFECTS DEPEND ON CONCENTRATION AND HOW SOON AFTER EXPOSURE THE EYES ARE WASHED.

SKIN:
CORROSIVE.

NOTE THAT IRRITATION MAY FOLLOW AN INITIAL LATENCY (DELAY BETWEEN THE TIME THAT THE EXPOSURE OCCURS AND WHEN THE SENSE OF IRRITATION STARTS). THE LATENT PERIOD CAN VARY AS MUCH AS HOURS FOR A DILUTE SOLUTION (0.04%) TO MINUTES WITH MORE CONCENTRATED SOLUTIONS (25-50%).

PROLONGED OR REPEATED CONTACT, EVEN TO DILUTE CONCENTRATIONS, CAN CAUSE A HIGH DEGREE OF TISSUE DESTRUCTION.

INGESTION:
CORROSIVE.

SEVERE BURNS AND COMPLETE TISSUE PERFORATION OF MUCOUS MEMBRANES OF MOUTH, THROAT AND STOMACH.

REPEATED EXPOSURE (CHRONIC)
NO KNOWN CHRONIC EFFECTS.

SYNERGISTIC MATERIALS:
NONE KNOWN.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
NONE KNOWN.

. FIRST AID MEASURES

EYES:
IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER FOR AT LEAST 15 MINUTES, FORCIBLY HOLDING EYELIDS APART TO ENSURE COMPLETE IRRIGATION OF ALL EYE AND LID TISSUE. WASHING EYES WITHIN SEVERAL SECONDS IS ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN:
FLUSH THOROUGHLY WITH COOL WATER UNDER SHOWER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. DISCARD NON-RUBBER SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

INHALATION:
REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, HAVE TRAINED PERSON ADMINISTER OXYGEN. IF RESPIRATION STOPS, HAVE A TRAINED PERSON ADMINISTER ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. (IF AVAILABLE, GIVE SEVERAL GLASSES OF MILK.) IF VOMITING OCCURS SPONTANEOUSLY, KEEP AIRWAY CLEAR AND GIVE MORE WATER. GET MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN:
NO SPECIALIZED PROCEDURES. TREAT FOR CLINICAL SYMPTOMS.

RODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

. FIRE FIGHTING MEASURES

FLASH POINT: NON-FLAMMABLE

METHOD: NOT APPLICABLE

AUTOIGNITION TEMPERATURE: NON-FLAMMABLE

FLAMMABLE LIMITS IN AIR, BY % VOLUME
UPPER: NON-FLAMMABLE
LOWER: NON-FLAMMABLE

EXTINGUISHING MEDIA:
NON-FLAMMABLE / NON-COMBUSTIBLE.

USE WATER SPRAY TO KEEP FIRE-EXPOSED CONTAINERS COOL.

FIRE FIGHTING PROCEDURES:
USE WATER TO COOL CONTAINERS BUT AVOID GETTING WATER INTO CONTAINERS. WEAR NIOSH/MSHA APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.

FIRE AND EXPLOSION HAZARD:
DIRECT CONTACT WITH WATER CAN CAUSE A VIOLENT EXOTHERMIC REACTION.

SENSITIVITY TO MECHANICAL IMPACT:
NOT SENSITIVE.

SENSITIVITY TO STATIC DISCHARGE:
NOT SENSITIVE.

. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
EVACUATE UNNECESSARY PERSONNEL.

FOLLOW PROTECTIVE MEASURES PROVIDED UNDER PERSONAL PROTECTION IN SECTION 8.

ENVIRONMENTAL PRECAUTIONS:
ACCORDING TO 40 CFR 302 TABLE 302.4 (CERCLA), ENVIRONMENTAL RELEASES THAT EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER BY CALLING 800-424-8802 (202-426-2675) AND THE STATE EMERGENCY RESPONSE COMMISSION AND THE LOCAL EMERGENCY PLANNING COMMITTEE (40 CFR 355.40) AS APPROPRIATE.

CONTAIN LIQUIDS AND PREVENT DISCHARGES TO STREAMS OR SEWERS, CONTROL

OR STOP THE LOSS OF VOLATILE MATERIALS TO THE ATMOSPHERE. LARGE LEAKS MAY REQUIRE ENVIRONMENTAL CONSIDERATION AND POSSIBLE EVACUATION. DO NOT APPLY WATER TO THE LEAK. SPILLS OR RELEASES SHOULD BE REPORTED, IF REQUIRED, TO THE APPROPRIATE LOCAL, STATE AND FEDERAL AGENCIES.

CONTAIN SPILL WITH DIKE TO PREVENT ENTRY INTO SEWERS OR WATERWAYS.

CAUTION: THIS PRODUCT MAY REACT STRONGLY WITH ACIDS AND WATER.

NEVER FLUSH TO SEWER.

METHODS FOR CLEANING UP:
DRY MATERIAL CAN BE SHOVELED UP, LIQUID MATERIAL CAN BE REMOVED WITH A VACUUM TRUCK. NEUTRALIZE REMAINING TRACES WITH ANY DILUTE INORGANIC ACID (HYDROCHLORIC, SULFURIC OR ACETIC ACID). FLUSH SPILL AREA WITH WATER FOLLOWED BY A LIBERAL COVERING OF SODIUM CARBONATE. ALL CLEAN-UP MATERIAL SHOULD BE REMOVED FOR PROPER TREATMENT OR DISPOSAL. SPILLS ON OTHER THAN PAVEMENT (EG. DIRT OR SAND) MAY BE HANDLED BY REMOVING THE AFFECTED SOIL AND PLACING IN APPROVED CONTAINERS.

HANDLING AND STORAGE

HANDLING:
AVOID BREATHING MIST.

AVOID BREATHING VAPORS.

HAZARDOUS CARBON MONOXIDE GAS CAN FORM UPON CONTACT WITH FOOD AND BEVERAGE PRODUCTS IN ENCLOSED SPACES AND CAN CAUSE DEATH. FOLLOW APPROPRIATE TANK ENTRY PROCEDURES (ANSI Z117.1).

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPOR AND SHOULD BE HANDLED AS IF THEY WERE FULL.

DO NOT TAKE INTERNALLY

WASH THOROUGHLY AFTER HANDLING; EXPOSURE CAN CAUSE BURNS WHICH ARE NOT IMMEDIATELY PAINFUL OR VISIBLE.

IF PRODUCT IS ADDED TOO RAPIDLY, OR WITHOUT STIRRING, AND BECOMES CONCENTRATED AT BOTTOM OF MIXING VESSEL, EXCESSIVE HEAT MAY BE GENERATED, RESULTING IN DANGEROUS BOILING AND SPATTERING, AND A POSSIBLE IMMEDIATE AND VIOLENT ERUPTION OF HIGHLY CAUSTIC SOLUTION.

SPECIAL MIXING AND HANDLING INSTRUCTIONS:
CONSIDERABLE HEAT IS GENERATED WHEN PRODUCT IS MIXED WITH WATER. THEREFORE, WHEN MAKING SOLUTIONS ALWAYS CAREFULLY FOLLOW THESE STEPS:

ALWAYS WEAR ALL PROTECTIVE CLOTHING DESCRIBED ABOVE. NEVER ADD WATER TO PRODUCT. ALWAYS ADD PRODUCT, WITH CONSTANT STIRRING, SLOWLY TO SURFACE OF LUKEWARM (80-100 F) WATER, TO ASSURE PRODUCT IS BEING COMPLETELY DISSOLVED AS IT IS ADDED.

PRODUCT CAN REACT EXPLOSIVELY WITH ACIDS, ALDEHYDES, AND MANY OTHER ORGANIC CHEMICALS, ADD PRODUCT VERY GRADUALLY, WHILE STIRRING CONSTANTLY. IF PRODUCT IS ADDED TOO RAPIDLY, OR WITHOUT STIRRING, AND BECOMES CONCENTRATED AT BOTTOM OF MIXING VESSEL, EXCESSIVE HEAT MAY BE GENERATED, RESULTING IN DANGEROUS BOILING AND SPATTERING, AND A POSSIBLE IMMEDIATE AND VIOLENT ERUPTION OF HIGHLY CAUSTIC SOLUTION.

ALWAYS EMPTY AND CLEAN CONTAINERS OF ALL RESIDUES BEFORE ADDING PRODUCT, TO AVOID POSSIBLE EXPLOSIVE REACTION BETWEEN PRODUCT AND UNKNOWN RESIDUE.

RETURNABLE CONTAINERS SHOULD BE SHIPPED IN ACCORDANCE WITH SUPPLIER'S RECOMMENDATIONS. RETURN SHIPMENTS SHOULD COMPLY WITH ALL FEDERAL, STATE, AND DOT REGULATIONS. ALL RESIDUE SHOULD BE REMOVED FROM CONTAINERS PRIOR TO DISPOSAL.

AVOID CONTACT WITH ALUMINUM, TIN, ZINC, AND ALLOYS CONTAINING THESE METALS. AVOID CONTACT WITH LEATHER, WOOL, ACIDS, ORGANIC HALOGEN COMPOUNDS AND ORGANIC NITRO COMPOUNDS.

STORAGE:

KEEP CONTAINER TIGHTLY CLOSED AND PROPERLY LABELED.

DIKE STORAGE CONTAINERS TO CONTAIN 110% OF TANK VOLUME.

UNDER NORMAL CONDITIONS, THIS PRODUCT CAN BE STORED SATISFACTORILY IN MILD STEEL WITHOUT AN INTERIOR LINING. ALUMINUM IS NOT RECOMMENDED FOR STORAGE AND HANDLING.

. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

NOTE: WHERE CARBON MONOXIDE MAY BE GENERATED, SPECIAL VENTILATION MAY BE REQUIRED.

WHERE ENGINEERING CONTROLS ARE NOT FEASIBLE USE ADEQUATE LOCAL EXHAUST VENTILATION WHEREVER MIST, SPRAY OR VAPOR MAY BE GENERATED.

NO SPECIAL VENTILATION REQUIRED UNDER NORMAL USE.

PERSONAL PROTECTION

PRODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

RESPIRATORY:
RESPIRATORY PROTECTION IS NOT REQUIRED UNDER NORMAL USE.

WEAR A NIOSH/MSHA APPROVED RESPIRATOR FOLLOWING MANUFACTURER'S RECOMMENDATIONS, WHERE AIRBORNE CONTAMINANTS MAY OCCUR.

EYE/FACE:
WEAR CHEMICAL SAFETY GOGGLES PLUS FULL FACE SHIELD TO PROTECT AGAINST SPLASHING WHEN APPROPRIATE (ANSI Z87.1).

SKIN:
WEAR CHEMICAL RESISTANT GLOVES SUCH AS RUBBER, NEOPRENE OR VINYL.

WASH CONTAMINATED CLOTHING AND DRY BEFORE REUSE.

WHENEVER THERE IS A POSSIBILITY OF SPLASH OR CONTACT WEAR A CHEMICAL RESISTANT FULL BODY SUIT AND BOOTS.

OTHER:
STANDARD WORK CLOTHING CLOSED AT THE NECK AND WRISTS.

DISCARD SHOES THAT CANNOT BE DECONTAMINATED.

EMERGENCY SHOWER AND EYEWASH FACILITY SHOULD BE IN CLOSE PROXIMITY (ANSI Z358.1).

9. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	CONCENTRATION, WEIGHT % 10	20	30	45	47	48	50
BOILING PT @ 760 MM HG, C	102	104	113	133	138	138	143
FREEZING PT C	-8	-23	-89	-29	-12	-2	4
VAPOR PRESS., MM HG @ 60 C	.....NA.....						
SPEC. GRAV. @ 15.6 C	1.09	1.18	1.29	1.45	1.48	1.49	1.52
DENSITY, LB/GAL @ 15.6 C	9.09	9.84	10.75	12.09	12.34	12.42	12.67
SOL. IN H20, % BY WT.	.....COMPLETELY SOLUBLE.....						
VAPOR DENSITY	.....NOT APPLICABLE.....						
PH	0.01 MOLES/LITER HAS PH OF 12.0						

RODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

APPEARANCE AND ODOR: CLEAR LIQUID WITH NO DISTINCT ODOR

SOLUBILITY IN WATER (% BY WT.): COMPLETELY SOLUBLE

VOC (G/L. BY WT.): 0

0. STABILITY AND REACTIVITY

CHEMICAL STABILITY:

__X__ STABLE _____ UNSTABLE

REACTS WITH:

__X__ AIR	_____ OXIDIZERS	__X__ METALS
__X__ WATER	__X__ ACIDS	__X__ OTHER
_____ HEAT	_____ ALKALIS	_____ NONE

HAZARDOUS POLYMERIZATION:

_____ OCCURS __X__ WILL NOT OCCUR

COMMENTS:
AVOID DIRECT CONTACT WITH WATER.

PRODUCT IS CORROSIVE TO TIN, ALUMINUM, ZINC AND ALLOYS CONTAINING THESE METALS AND WILL REACT WITH THESE METALS IN POWDER FORM. AVOID CONTACT WITH LEATHER, WOOL, ACIDS, ORGANIC HALOGEN COMPOUNDS, OR ORGANIC NITRO COMPOUNDS. HAZARDOUS CARBON MONOXIDE GAS CAN FORM UPON CONTACT WITH REDUCING SUGARS, FOOD AND BEVERAGE PRODUCTS IN ENCLOSED SPACES AND CAN CAUSE DEATH. FOLLOW APPROPRIATE TANK ENTRY PROCEDURES.

SEE HANDLING AND STORAGE (SECTION 7).

HAZARDOUS DECOMPOSITION PRODUCTS:
NONE.

1. TOXICOLOGICAL INFORMATION

1310-58-3 POTASSIUM HYDROXIDE (KOH)

ACUTE ORAL LD50 :	(RAT)	365 MG/KG
PRIMARY SKIN IRRITATION :	(RABBIT, 24HR)	SEVERE
PRIMARY EYE IRRITATION :	(RABBIT, 24HR)	SEVERE

HUMAN DERMAL EXPOSURE: REGARDLESS OF CONCENTRATION, THE SEVERITY OF DAMAGE AND EXTENT OF ITS IRREVERSIBILITY INCREASES WITH LENGTH OF CONTACT TIME. PROLONGED CONTACT WITH EVEN DILUTE POTASSIUM HYDROXIDE SOLUTION (>2.0%) CAN CAUSE A HIGH DEGREE OF TISSUE DESTRUCTION. THE

LATENT PERIOD, FOLLOWING SKIN CONTACT DURING WHICH NO SENSATION OF IRRITATION OCCURS ALSO VARIES WITH CONCENTRATION.

SECTION THAT FOLLOWS HAS BEEN REVISED

12. ECOLOGICAL INFORMATION

1310-58-3 POTASSIUM HYDROXIDE (KOH)

AQUATIC ECOTOX DATA

FISH:

LC50 (96 HR.)	(FATHEAD MINNOW)	179	MG/L*

INVERTEBRATE:

EC50 (48 HR.)	(WATER FLEA)	60	MG/L*

PLANT:

EC50 (96 HR.)	(GREEN ALGAE)	61	MG/L*

* DATA REPRESENTS 45.25 % KOH IN AQUEOUS SOLUTION

TERRESTRIAL ECOTOX DATA

NO DATA AVAILABLE

ENVIRONMENTAL FATE DATA

BIOTIC:

BIODEG. INORGANIC, NOT SUBJECT TO BIODEGRADATION

THIS MATERIAL HAS PRODUCED SLIGHT TOXICITY IN LABORATORY TESTS WITH AQUATIC ORGANISMS. THIS MATERIAL IS STRONGLY ALKALINE. IF RELEASED TO SURFACE WATER, THIS COMPOUND WILL CAUSE THE PH TO RISE DEPENDENT ON THE BUFFERING CAPACITY OF THE WATERBODY. AQUATIC ORGANISMS BECOME INCREASINGLY STRESSED AS PH EXCEEDS 9, WITH MANY AQUATIC SPECIES BEING INTOLERANT OF PH IN EXCESS OF 10. THIS COMPOUND DOES NOT BIOACCUMULATE IN ORGANISMS. DUE CAUTION SHOULD BE EXERCISED TO PREVENT THE ACCIDENTAL RELEASE OF THIS MATERIAL TO THE ENVIRONMENT.

13. DISPOSAL CONSIDERATIONS

RECOVERY AND REUSE, RATHER THAN DISPOSAL, SHOULD BE THE ULTIMATE GOAL OF HANDLING EFFORTS.

DISPOSE OF ALL WASTE AND CONTAMINATED EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL HEALTH AND ENVIRONMENTAL REGULATIONS.

ENSURE THAT ALL RESPONSIBLE FEDERAL, STATE, AND LOCAL AGENCIES RECEIVE PROPER NOTIFICATION OF SPILL AND DISPOSAL METHODS.

SHIPMENTS OF WASTE MATERIALS MAY BE SUBJECT TO MANIFESTING REQUIREMENTS PER APPLICABLE REGULATIONS. APPROPRIATE DISPOSAL WILL

DEPEND ON THE NATURE OF EACH WASTE MATERIAL AND SHOULD BE DONE BY A COMPETENT AND PROPERLY PERMITTED CONTRACTOR.

THE MATERIALS RESULTING FROM CLEAN-UP OPERATIONS MAY BE HAZARDOUS WASTES AND, THEREFORE, SUBJECT TO SPECIFIC REGULATIONS. PACKAGE, STORE, TRANSPORT, AND DISPOSE OF ALL (CLEAN-UP) MATERIALS AND ANY CONTAMINATED EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

4. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: POTASSIUM HYDROXIDE SOLUTION

DOT HAZARD CLASS: 8

DOT IDENTIFICATION NO: UN1814

DOT PACKING GROUP: II

DOT HAZARDOUS SUBSTANCE: RQ 1000 LBS (POTASSIUM HYDROXIDE)

DOT MARINE POLLUTANT(S): NOT APPLICABLE

ADDITIONAL DESCRIPTION REQUIREMENT: NOT APPLICABLE

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:
OSHA STANDARD 29 CFR 1910.1200 REQUIRES THAT INFORMATION BE PROVIDED TO EMPLOYEES REGARDING THE HAZARDS OF CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM INCLUDING LABELING, MATERIAL SAFETY DATA SHEETS, TRAINING AND ACCESS TO WRITTEN RECORDS. WE REQUEST THAT YOU, AND IT IS YOUR LEGAL DUTY TO, MAKE ALL INFORMATION IN THIS MATERIAL SAFETY DATA SHEET AVAILABLE TO YOUR EMPLOYEES.

TO AID OUR CUSTOMERS IN COMPLYING WITH REGULATORY REQUIREMENTS, SARA TITLE III HAZARD CATEGORIES FOR THIS PRODUCT ARE INDICATED BELOW. IF THE WORD "YES" APPEARS NEXT TO ANY CATEGORY, THIS PRODUCT MAY BE REPORTABLE BY YOU UNDER THE REQUIREMENTS OF 40.CFR.370. PLEASE CONSULT THOSE REGULATIONS FOR DETAILS.

TSCA:
ALL COMPONENTS OF THIS PRODUCT THAT ARE REQUIRED TO BE ON THE TSCA INVENTORY ARE LISTED ON THE INVENTORY.

SARA/TITLE III HAZARD CATEGORIES:

IMMEDIATE(ACUTE) HEALTH:	_YES_	REACTIVE HAZARD	_YES_
DELAYED(CHRONIC) HEALTH:	_NO__	SUDDEN RELEASE OF PRESSURE	_NO__

PRODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

FIRE HAZARD: NO

HMIS HAZARD RATINGS:
HEALTH HAZARD: 3 FIRE HAZARD: 0 REACTIVITY: 2

STATE REGULATIONS:
SEE SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS LIST LEGEND FOR APPLICABLE STATE REGULATION.

INTERNATIONAL REGULATIONS:
CONSULT THE REGULATIONS OF THE IMPORTING COUNTRY.

CANADA:
WHMIS HAZARD CLASS: D1B, E

16. OTHER INFORMATION

FOR ADDITIONAL NON-EMERGENCY HEALTH, SAFETY OR ENVIRONMENTAL INFORMATION TELEPHONE (972) 404-2076 OR WRITE TO:

OCCIDENTAL CHEMICAL CORPORATION
PRODUCT STEWARDSHIP DEPARTMENT
5005 LBJ FREEWAY
P.O. BOX 809050
DALLAS, TEXAS 75380

MSDS LEGEND:

ACGIH = AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

CAS = CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER

CEILING = CEILING LIMIT (15 MINUTES)

CEL = CORPORATE EXPOSURE LIMIT

OSHA = OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

PEL = PERMISSIBLE EXPOSURE LIMIT (OSHA)

STEL = SHORT TERM EXPOSURE LIMIT (15 MINUTES)

TDG = TRANSPORTATION OF DANGEROUS GOODS (CANADA)

TLV = THRESHOLD LIMIT VALUE (ACGIH)

TWA = TIME WEIGHTED AVERAGE (8 HOURS)

PRODUCT: CAUSTIC POTASH-LIQUID (ALL GRADES)

ORDER NO: 240734
PROD NO : 603900

WHMIS = WORKER HAZARDOUS MATERIALS INFORMATION SYSTEM (CANADA)

* = SEE SECTION 3 HAZARDS IDENTIFICATION - REPEATED EXPOSURE(CHRONIC) INFORMATION

IMPORTANT: THE INFORMATION PRESENTED HEREIN, WHILE NOT GUARANTEED, WAS PREPARED BY COMPETENT TECHNICAL PERSONNEL AND IS TRUE AND ACCURATE TO THE BEST OF OUR KNOWLEDGE. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, OR OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, STABILITY OR OTHERWISE. THIS INFORMATION IS NOT INTENDED TO BE ALL-INCLUSIVE AS TO THE MANNER AND CONDITIONS OF USE, HANDLING AND STORAGE. OTHER FACTORS MAY INVOLVE OTHER OR ADDITIONAL SAFETY OR PERFORMANCE CONSIDERATIONS. WHILE OUR TECHNICAL PERSONNEL WILL BE HAPPY TO RESPOND TO QUESTIONS REGARDING SAFE HANDLING AND USE PROCEDURES, SAFE HANDLING AND USE REMAINS THE RESPONSIBILITY OF THE CUSTOMER. NO SUGGESTIONS FOR USE ARE INTENDED AS, AND NOTHING HEREIN SHALL BE CONSTRUED AS A RECOMMENDATION TO INFRINGE ANY EXISTING PATENTS OR VIOLATE ANY FEDERAL, STATE OR LOCAL LAWS, RULES, REGULATIONS OR ORDINANCES.

THIS MATERIAL SAFETY DATA SHEET (MSDS) COVERS THE FOLLOWING MATERIALS:

- CAUSTIC POTASH-LIQUID (ALL GRADES)
- COMMERCIAL GRADE 50%
- POTASH 48%
- KOH LIQUID LOW SOD 50%
- KOH LIQUID LOW SOD 45%
- KOH LIQUID 48%
- KOH LIQUID 50%
- KOH LIQUID 45% MEMBRANE
- 50% CAUSTIC POTASH WC
- 50% CAUSTIC POTASH-LOW SODIUM
- 45% CAUSTIC POTASH-LOW SODIUM
- 50% CAUSTIC POTASH LOW SODIUM
- 45% CAUSTIC POTASH-COMMERCIAL GRADE
- 45% CAUSTIC POTASH-LOW CHLORIDE
- 50% CAUSTIC POTASH-COMMERCIAL GRADE
- 50% CAUSTIC POTASH-LOW CHLORIDE
- 47% CAUSTIC POTASH LOW SODIUM

- 48% CAUSTIC POTASH
- 45% CAUSTIC POTASH COMMERCIAL
- 45% CAUSTIC POTASH LOW CHLORIDE
- 50% CAUSTIC POTASH COMMERCIAL GRADE
- 47.5% CAUSTIC POTASH LOW SODIUM
- CAUSTIC POTASH LIQUID (10-40% SOLUTION)
- 40% LIQUID CAUSTIC POTASH

- 45% CAUSTIC POTASH-MEMBRANE
- 50% CAUSTIC POTASH-MEMBRANE
- CAUSTIC POTASH MEMBRANE-DILUTE SOLUTION
- 30% CAUSTIC POTASH COMMERCIAL GRADE
- 10% CAUSTIC POTASH COMMERCIAL GRADE
- 45% CAUSTIC PATASH MEMBRANE
- 50% CAUSTIC POTASH MEMBRANE
- 25% LIQUID CAUSTIC POTASH-COMMERCIAL GRADE

7. WARNING LABEL INFORMATION

SIGNAL WORD:
DANGER

HAZARD WARNINGS:
MAY CAUSE BURNS TO THE EYES, SKIN, AND MUCOUS MEMBRANES.

MAY CAUSE PERMANENT EYE DAMAGE.

INHALATION OF DUST, MIST, OR SPRAY CAN CAUSE SEVERE LUNG DAMAGE.

CAN REACT VIOLENTLY WITH WATER, ACIDS AND OTHER SUBSTANCES.

PRECAUTIONS:
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

AVOID BREATHING DUST, VAPORS OR MIST.

DO NOT SWALLOW.

USE WITH ADEQUATE VENTILATION AND WEAR RESPIRATORY PROTECTION WHEN EXPOSURE TO DUST, MIST, OR SPRAY IS POSSIBLE.

WEAR SAFETY GLASSES WITH SIDE SHIELDS OR CHEMICAL SPLASH GOGGLES, PROTECTIVE CLOTHING AND CHEMICAL RESISTANT GLOVES.

WASH THOROUGHLY AFTER HANDLING; EXPOSURE CAN CAUSE BURNS WHICH ARE NOT IMMEDIATELY PAINFUL OR VISIBLE.

KEEP CONTAINER TIGHTLY CLOSED AND PROPERLY LABELED.

PRODUCT CAN REACT VIOLENTLY WITH WATER, ACIDS AND OTHER SUBSTANCES. SEE HANDLING AND STORAGE (SECTION 7) OF THE MSDS FOR INSTRUCTIONS BEFORE USING.

AVOID CONTACT WITH ALUMINUM, TIN, ZINC, AND ALLOYS CONTAINING THESE METALS. AVOID CONTACT WITH LEATHER, WOOL, ACIDS, ORGANIC HALOGEN COMPOUNDS AND ORGANIC NITRO COMPOUNDS.

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HAZARDOUS CARBON MONOXIDE GAS CAN FORM UPON CONTACT WITH FOOD AND BEVERAGE PRODUCTS IN ENCLOSED SPACES AND CAN CAUSE DEATH. FOLLOW APPROPRIATE TANK ENTRY PROCEDURES (ANSI Z117.1).

FIRST AID

EYES:
IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER FOR AT LEAST 15 MINUTES, FORCIBLY HOLDING EYELIDS APART TO ENSURE COMPLETE IRRIGATION OF ALL EYE AND LID TISSUE. WASHING EYES WITHIN SEVERAL SECONDS IS ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN:
FLUSH THOROUGHLY WITH COOL WATER UNDER SHOWER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. DISCARD NON-RUBBER SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

INHALATION:
REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, HAVE TRAINED PERSON ADMINISTER OXYGEN. IF RESPIRATION STOPS, HAVE A TRAINED PERSON ADMINISTER ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. (IF AVAILABLE, GIVE SEVERAL GLASSES OF MILK.) IF VOMITING OCCURS SPONTANEOUSLY, KEEP AIRWAY CLEAR AND GIVE MORE WATER. GET MEDICAL ATTENTION IMMEDIATELY.

IN CASE OF SPILL OR LEAK:
LEAKS SHOULD BE STOPPED.

CAUTION: THIS PRODUCT MAY REACT STRONGLY WITH ACIDS AND WATER.

SCOOP OR SWEEP UP ALL SPILLED PRODUCT AND OTHER CONTAMINATED MATERIAL AND PLACE IN MARKED DISPOSAL CONTAINERS

NEUTRALIZE RESIDUE WITH DILUTE ACID AND FLUSH SPILL AREA WITH WATER FOLLOWED BY A LIBERAL COVERING OF SODIUM CARBONATE.

DISPOSE OF WASH WATER AND SPILL BY-PRODUCTS ACCORDING TO FEDERAL, STATE AND LOCAL REGULATIONS.

SPILLS OF 1000 POUNDS OR MORE MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 1-800-424-8802.

STATE AND LOCAL REGULATIONS MAY HAVE ADDITIONAL REPORTING REQUIREMENTS, CHECK WITH THE PROPER STATE AND LOCAL AUTHORITIES.

WEAR NEOPRENE OR RUBBER GLOVES.

FIRE:

MATERIAL DOES NOT BURN.

USE EXTINGUISHING MEDIUM AS APPROPRIATE FOR SURROUNDING FIRE.

HANDLING AND STORAGE:

CONSIDERABLE HEAT IS GENERATED WHEN PRODUCT IS MIXED WITH WATER. THEREFORE, WHEN MAKING SOLUTIONS ALWAYS CAREFULLY FOLLOW THESE STEPS:

ALWAYS WEAR ALL PROTECTIVE CLOTHING DESCRIBED ABOVE. NEVER ADD WATER TO PRODUCT. ALWAYS ADD PRODUCT, WITH CONSTANT STIRRING, SLOWLY TO SURFACE OF LUKEWARM (80-100 F) WATER, TO ASSURE PRODUCT IS BEING COMPLETELY DISSOLVED AS IT IS ADDED.

PRODUCT CAN REACT EXPLOSIVELY WITH ACIDS, ALDEHYDES, AND MANY OTHER ORGANIC CHEMICALS, ADD PRODUCT VERY GRADUALLY, WHILE STIRRING CONSTANTLY. IF PRODUCT IS ADDED TOO RAPIDLY, OR WITHOUT STIRRING, AND BECOMES CONCENTRATED AT BOTTOM OF MIXING VESSEL, EXCESSIVE HEAT MAY BE GENERATED, RESULTING IN DANGEROUS BOILING AND SPATTERING, AND A POSSIBLE IMMEDIATE AND VIOLENT ERUPTION OF HIGHLY CAUSTIC SOLUTION.

ALWAYS EMPTY AND CLEAN CONTAINERS OF ALL RESIDUES BEFORE ADDING PRODUCT, TO AVOID POSSIBLE EXPLOSIVE REACTION BETWEEN PRODUCT AND UNKNOWN RESIDUE.

RETURNABLE CONTAINERS SHOULD BE SHIPPED IN ACCORDANCE WITH SUPPLIER'S RECOMMENDATIONS. RETURN SHIPMENTS SHOULD COMPLY WITH ALL FEDERAL, STATE, AND DOT REGULATIONS. ALL RESIDUE SHOULD BE REMOVED FROM CONTAINERS PRIOR TO DISPOSAL.

CONTAINERS THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPOR AND SHOULD BE HANDLED AS IF THEY WERE FULL.

DISPOSAL:

A SPILL OR RELEASE OF THIS MATERIAL MAY TRIGGER THE EMERGENCY RELEASE REPORTING REQUIREMENTS UNDER SARA, TITLE III (40 CFR, PART 355) AND/OR CERCLA (40 CFR, PART 300). STATE OR LOCAL REPORTING REQUIREMENTS MAY DIFFER FROM FEDERAL REQUIREMENTS. CONSULT COUNSEL FOR FURTHER GUIDANCE ON YOUR RESPONSIBILITIES UNDER THESE LAWS.

MATERIAL THAT CANNOT BE REUSED OR CHEMICALLY REPROCESSED SHOULD BE DISPOSED OF IN A MANNER MEETING GOVERNMENT REGULATIONS.

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ALWAYS PACKAGE,STORE, TRANSPORT AND DISPOSE OF ALL WASTE AND CONTAMINATED EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL HEALTH AND ENVIRONMENTAL REGULATIONS.

APPROPRIATE DISPOSAL WILL DEPEND ON THE NATURE OF EACH WASTE MATERIAL AND SHOULD BE DONE BY A COMPETENT AND PROPERLY PERMITTED CONTRACTOR.

INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:
THIS PRODUCT CONTAINS:

CAS#	NAME
7732-18-5	WATER
1310-58-3	POTASSIUM HYDROXIDE (KOH)

HMIS RATING: HEALTH 3 FLAMMABILITY 0 REACTIVITY 2

LABEL NUMBER: 0198M31866

FOR INDUSTRIAL USE ONLY

NEW YORK BULK STORAGE SUPPLEMENT TO MSDS

EQUIPMENT RECOMMENDATIONS FOR PRODUCT STORAGE

STORAGE TANKS

STORAGE FACILITIES FOR LIQUID CAUSTIC POTASH MUST HAVE THE CAPACITY TO ACCOMMODATE THE SHIPMENTS TO BE RECEIVED. PROVISIONS MUST BE MADE FOR A RESERVE SUPPLY BETWEEN SHIPMENTS. IN THE CASE OF 16,000 GALLON TANK-CAR SHIPMENTS, IT IS SUGGESTED THAT TOTAL STORAGE CAPACITY BE AT LEAST DOUBLE THE TANK CAR CAPACITY (32,000 GALLONS). IF TANK TRUCKS OF 4000 GALLONS ARE TO BE RECEIVED, IT IS SUGGESTED THAT STORAGE SPACE OF AT LEAST 6000 GALLONS BE AVAILABLE. A LARGER TANK WILL BE NECESSARY IF DILUTION OF THE CAUSTIC POTASH IS PLANNED.

SPECIFICATIONS FOR FABRICATION SHOULD ADHERE TO API 650 SPECIFICATION FOR NON-PRESSURIZED VESSELS. THE PIPE CONNECTION FOR WITHDRAWING THE LIQUOR FROM STORAGE SHOULD BE LOCATED AT LEAST FOUR INCHES ABOVE THE BOTTOM OF THE TANK. A DRAIN CONNECTION AT THE LOWEST POINT OF THE TANK ALSO SHOULD BE INCLUDED TO FACILITATE DRAINING DURING PERIODIC CLEANING OF THE TANK.

CAUSTIC POTASH SOLUTIONS IN THE RANGE OF 23-45% REQUIRE NO HEATING EQUIPMENT BECAUSE THE FREEZING POINTS IN THIS RANGE ARE BELOW -20 F. SOLUTIONS OUT OF THIS RANGE MAY REQUIRE HEATING EQUIPMENT AND/OR INSULATION DEPENDING ON THE ENVIRONMENT. FOR EXAMPLE, SOLUTIONS OF 46%, 48%, AND 50% FREEZE AT APPROXIMATELY 0 F, 20 F, AND 40 F RESPECTIVELY. IF INSULATION IS NECESSARY, A TWO-INCH LAYER OF

POLYURETHANE FOAM OR EQUIVALENT IS NORMALLY ADEQUATE. IF HEATING IS NECESSARY TO MAINTAIN PROPER STORAGE TEMPERATURE, LOW PRESSURE STEAM THROUGH A NICKEL OR STAINLESS STEEL HEATING COIL IN THE STORAGE TANK IS THE MOST COMMON WAY TO ACHIEVE IT. IF STEAM IS NOT AVAILABLE, AN ELECTRICAL IMMERSION HEATER CAN BE SUBSTITUTED.

STORAGE TANK LINERS ARE OFTEN EMPLOYED WITH CAUSTIC POTASH SOLUTIONS TO MAINTAIN PRODUCT QUALITY. PREFERRED LININGS ARE BAKED-ON PHENOLIC RESINS SUCH AS:

AMERCOAT NO.	75
CHEMPON NO.	2310
GLIDDEN NO.	301
FARBOCOTE NO.	47
PLASITE	7122

PIPELINES

PIPELINES SHOULD BE AT LEAST TWO INCHES IN DIAMETER (WITH THREE-INCH LINES ON THE SUCTION SIDES OF PUMPS) AND SHOULD BE CONSTRUCTED OF SCHEDULE 40 BLACK IRON OR MILD STEEL WITH WELDED OR FLANGED JOINTS. WHERE DISCONNECTS ARE NECESSARY, WELDED FLANGED JOINTS ARE PREFERRED TO FACILITATE MAINTENANCE. WHERE SCREWED CONNECTIONS ARE NECESSARY, TEFLON4 TAPE SHOULD BE USED. PIPELINE SHOULD BE PITCHED (A MINIMUM OF 6 INCHES PER 100 FT) IN ORDER TO PERMIT COMPLETE DRAINING. LOOPS AND POCKETS SHOULD BE AVOIDED. LINES SHOULD ALSO BE FITTED WITH STEAM OR AIR CONNECTIONS TO PERMIT BLOWING OUT AFTER USE. OUTDOOR LINES USED FOR SOLUTIONS OUT OF THE 23-45% RANGE SHOULD BE HEAT TRACED AND INSULATED.

VALVES

GENERALLY, TEFLON4-LINED QUARTER-TURN PLUG OR BALL VALVES ARE RECOMMENDED FOR CAUSTIC POTASH SERVICE. VARIOUS OTHER TYPES OF VALVES CAN ALSO BE USED. HOWEVER, IN CAUSTIC POTASH SYSTEMS, SIMPLE FITTINGS ARE THE MOST SATISFACTORY.

PUMPS

AN OPEN IMPELLER CENTRIFUGAL PUMP OF ALL IRON OR ALLOY 20 CONSTRUCTION, WITH EITHER MECHANICAL SEALS OR A DEEP PACKING GLAND, IS RECOMMENDED. ROTARY POSITIVE-DISPLACEMENT OR PISTON-TYPE PUMPS ARE ALSO SATISFACTORY. PACKING MATERIAL SHOULD BE GRAPHITE BRAIDED ASBESTOS OR EQUIVALENT.

PUMP LOCATION SHOULD RECEIVE CAREFUL CONSIDERATION. FOR EASE OF OPERATION, THE SUCTION LINE MUST BE AS SHORT AS POSSIBLE. INSTALLATION SHOULD INCLUDE A BY-PASS OR RECIRCULATING LINE. THIS REDUCES WEAR ON THE PUMP AND, IN MANY CASES, CAN BE USED AS A MEANS FOR CONTROLLING RATE OF FLOW.

METERS

CAUSTIC POTASH SOLUTIONS OF UP TO 20% CONCENTRATION AND AT LESS THAN 100 F CAN BE METERED THROUGH STANDARD ROTAMETERS HAVING GLASS TUBES AND NICKEL OR STAINLESS STEEL FLOATS. MAGNETIC OR ORIFICE-TYPE METERS ARE PREFERRED FOR HIGHER CONCENTRATION SOLUTIONS AND SHOULD BE OF IRON OR NICKEL CONSTRUCTION.

RECOMMENDED STORAGE CONDITIONS

THE IDEAL STORAGE TEMPERATURE FOR LIQUID CAUSTIC POTASH IS 60-80 F. STORAGE TEMPERATURES ABOVE 130 F IN UNLINED STEEL TANKS SHOULD BE AVOIDED DUE TO ACCELERATED CORROSION RATES AND SUBSEQUENT IRON PICKUP. LINED TANKS AVOID THIS CORROSION AND IRON PICKUP. THE TEMPERATURE LIMITATIONS OF ANY LINERS SHOULD BE CONSIDERED BEFORE INSTALLATION.

COMPATIBLE MATERIALS OF CONSTRUCTION

IRON AND STEEL ARE THE TWO MOST COMMON STRUCTURAL MATERIALS FOR HANDLING AND STORING CAUSTIC POTASH SOLUTIONS. THESE MATERIALS MILDLY ARE ATTACKED BY CAUSTIC POTASH SOLUTIONS UP TO ABOUT 120 F. AT TEMPERATURES ABOVE 130 F THE ATTACK IS ACCELERATED. STEEL SHOULD NOT BE USED AT TEMPERATURES ABOVE 130 F IF IRON PICKUP BY THE PRODUCT IS UNDESIRABLE.

STAINLESS STEEL, NICKEL AND NICKEL ALLOYS ARE MUCH MORE RESISTANT TO ATTACK THAN IS STEEL.

PLASTIC AND RUBBER CAN BE USED FOR LINING CAUSTIC POTASH STORAGE TANKS TO HELP MAINTAIN PRODUCT QUALITY. RUBBER DOES NOT WITHSTAND HIGH TEMPERATURES.

ALUMINUM, ZINC, BRASS, BRONZE, AND COPPER ARE READILY ATTACKED AND THEREFORE SHOULD NEVER BE USED IN CAUSTIC POTASH SERVICE.

RECOMMENDED INSPECTION AND MAINTENANCE PROCEDURES

STORAGE TANKS SHOULD BE CLEANED ON A ROUTINE SCHEDULE OF APPROXIMATELY EVERY FIVE YEARS. ASSOCIATED PIPING SHOULD BE INSPECTED AND CLEANED ON A YEARLY BASIS.

STORAGE TANK WALL THICKNESS READINGS SHOULD ALSO BE TAKEN EVERY THREE YEARS WITH AN ULTRASONIC TESTER TO ASSURE THAT THE WALL THICKNESS IS ACCEPTABLE. MAKE A COMPLETE INTERNAL INSPECTION AT LEAST EVERY FIVE YEARS.

HANDLING AND UNLOADING BULK DELIVERIES

ONLY RESPONSIBLE AND WELL-SUPERVISED EMPLOYEES SHOULD BE ENTRUSTED WITH THE UNLOADING OF LIQUID CAUSTIC POTASH. A WORKER SHOULD BE

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PRESENT DURING THE ENTIRE TIME THAT THIS PRODUCT IS BEING UNLOADED.

SINCE SERIOUS BURNS CAN RESULT FROM CONTACT OF CAUSTIC POTASH WITH THE SKIN, WORKMEN SHOULD BE WELL-PROTECTED AND CAUTIONED TO EXERCISE CARE. CHEMICAL SPLASH GOGGLES, RUBBER BOOTS, AND RUBBER OR RUBBER-COVERED GLOVES SHOULD BE WORN AT ALL TIMES. ALSO, WORKMEN SHOULD BE AS COMPLETELY COVERED AS POSSIBLE WITH LONG-SLEEVED SHIRTS BUTTONED UP AT THE NECKS, AND HARD HATS. WHERE RUBBER IS NOT SUITABLE FOR CLOTHING, COTTON IS PREFERRED OVER WOOL.

CAUSTIC POTASH SHOULD BE UNLOADED ONLY IN THE DAYTIME OR WHEN ADEQUATE LIGHTING IS AVAILABLE.

BEFORE UNLOADING, MAKE CERTAIN THAT THE STORAGE TANK IS VENTED AND HAS SUFFICIENT CAPACITY.

UNLOADING LINES FOR SOLUTIONS OUT OF THE RANGE OF 23-45% SHOULD BE COVERED WITH SUITABLE INSULATION AND HEATED JUST PRIOR TO TRANSFER OF LIQUID CAUSTIC POTASH TO STORAGE DURING COLD WEATHER. HEATING CAN BE PROVIDED BY A STEAM LINE RUNNING ALONG SIDE THE LINE AND UNDER THE INSULATION OR BY RUNNING STEAM THROUGH THE UNLOADING LINE. THESE PRECAUTIONS WILL PREVENT FREEZING OF THE CAUSTIC POTASH.

IF COMPRESSED AIR IS USED IN UNLOADING OPERATIONS, IT IS IMPORTANT THAT ALL FITTINGS BE INSPECTED FOR LEAKS OR OTHER DEFECTS BEFORE UNLOADING. IF LEAKS ARE FOUND, UNLOADING OPERATIONS SHOULD BE SUSPENDED UNTIL THEY ARE CORRECTED.

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FOR ADDITIONAL INFORMATION

CONTACT: MSDS COORDINATOR VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

08/30/00 15:48 PRODUCT: 603900 CUST NO: 250628 ORDER NO: 240734

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* * * E N D O F M S D S * * *

SUMMARY OF RESEARCH AND COORESPONDANCE RELATING TO AMENDING THE PROHIBITION AGAINST CAUSTIC POTASH FOR PEELING ORGANIC PEACHES

Certificate of Compliance

Certified Organic

NUMBER 99575-B

CERTIFIED ENTITY	J.R. Wood, Inc. 7916 W. Bellevue Road Atwater, CA 95301	
CERTIFIED PRODUCTS	Per Attached Schedule	
IDENTIFICATION MARKS	Per Attached Schedule	Received by OMRI MAR 15 2001
PRODUCT ORIGIN	Certified Entity's Facility	
EFFECTIVE	March 9, 2000 To March 8, 2001	

Quality Assurance International, upon providing this certification, states that it has received the Certified Entity's application, reviewed its records, inspected its fields and/or facilities; and has determined that the products identified above are organically grown and/or processed and/or handled in accordance with applicable standards and statutes. In its acceptance of this certification, the Certified Entity warrants, that it is in, and will remain in, full compliance with the Terms and Conditions of the Certification Agent; and in accordance with the general guidelines established by the Federal Organic Foods Production Act of 1990 (OFPA); and the specific statutes of the California Organic Foods Act of 1990.

Marian W Cavagga
AUTHORIZED SIGNATURE

QUALITY ASSURANCE INTERNATIONAL
12526 High Bluff Drive, Suite 300 • San Diego California, U.S.A. • (858) 792-3531 • Fax: (858) 792-8665

A100-98178

CERTIFIED PRODUCTS AND IDENTIFICATION MARKS FOR J.R. WOOD, INC.
(CERTIFICATE NO. 99575-B)

IQF
Apricot, Blackberry, Blueberry, Boysenberry, Carrot, Kabocha, Pasta, Peach, Potato, Strawberry, Squash, Sweet Potato, Turnip.

PUREE/CONCENTRATES
Apple, Apricot, Blackberry, Blueberry, Boysenberry, Carrot, Kabocha, Peach, Pear, Plum, Prune, Pumpkin, Nectarine, Strawberry, Squash, Sweet Potato.

CLEAR JUICE CONCENTRATE
Apple

REPACK
Apricot, Asparagus, Basil Powder, Beans (black, kidney, pinto, white), Bell Pepper, Blackberry, Blueberry, Boysenberry, Broccoli, Cantaloupe, Carrot, Cauliflower, Celery, Corn, Grape, Green Bean, Honeydew, Kabocha, Mango, Onion, Pasta, Peach, Peas, Potato, Spinach, Squash, Strawberry Sweet Potato, Tomato, Turnip, Zucchini.

Retail Labels
Nichirei
Nichiryu
Well Flag

Big Valley Master Case Industrial Food Service
Amy's Kitchen
Earth's Best
Knudsen & Sons/Smucker's
Organic Ingredients/Spectrum
Purepak, Inc.
S International

Marian W Cassayre
Authorized Signature

Quality Assurance International

Certificate of Compliance

Certified Organic

NUMBER 98726-C

CERTIFIED ENTITY	J.R. Wood, Inc. 7916 W. Bellevue Road Atwater, CA 95301
CERTIFIED PRODUCTS	Per Attached Schedule
IDENTIFICATION MARKS	Per Attached Schedule
PRODUCT ORIGIN	Certified Entity's Facility
EFFECTIVE	March 9, 1999 To March 8, 2000

Quality Assurance International, upon providing this certification, states that it has received the Certified Entity's application, reviewed its records, inspected its fields and/or facilities; and has determined that the products identified above are organically grown and/or processed and/or handled in accordance with applicable standards and statutes. In its acceptance of this certification, the Certified Entity warrants, that it is in, and will remain in, full compliance with the Terms and Conditions of the Certification Agent; and in accordance with the general guidelines established by the Federal Organic Foods Production Act of 1990 (OFPA); and the specific statutes of the California Organic Foods Act of 1990. Any QAI certified product that is exported to the European Union has been evaluated to be equivalent to EEC 2092/91.

AUTHORIZED SIGNATURE

QUALITY ASSURANCE INTERNATIONAL
12526 High Bluff Drive, Suite 300 • San Diego California, U.S.A. • (858) 792-3531 • Fax: (858) 792-8665

CERTIFIED PRODUCTS AND IDENTIFICATION MARKS FOR J.R. WOOD, INC.

(CERTIFICATE NO. 98726-C)

Products

Apple, Apricot, Asparagus, Banana, Barley Flour, Basil Powder, Beans (black, kidney, pinto, white), Blackberry, Blueberry, Boysenberry, Broccoli, Cantaloupe, Carrot, Cauliflower, Celery, Corn, Corn on the Cob, Grape, Green Beans, Honeydew, IQF Bell Pepper, IQF Broccoli, IQF Cauliflower, IQF Melons, IQF Peaches, IQF Strawberries, Lentil Flour, Macaroni Flour, Mango, Nectarine, Oat Flour, Onion, Parsnips, Pasta, Peaches, Pears, Peas, Peppers, Plum, Potatoes, Prunes, Pumpkin, Rice Flour, Spinach, Squash, Strawberry, Sweet Potatoes, Tomato, Turnips, Zucchini.

Baby Food

Apples & Apricots, Apples & Bananas, Apples & Blueberries, Apples & Mangoes, Apples & Plums, Applesauce, Carrots, Green Beans & Rice, Peaches, Peaches & Rice & Bananas, Pears, Pears & Strawberries, Peas, Peas & Rice, Plums & Banana Oat, Rice & Lentils, Spinach & Carrots, Summer Vegetables, Sweet Potatoes, Vegetables & Pasta, Winter Squash.

Retail Labels

Cascadian Farms
Mom's Organic Choice
Nichirei
Nichiryu
Organic Baby
Vegetarian Café

Big Valley master case

Amy's Kitchen
C.F. Fresh
Ceres Organic
Heinz/Earth's Best
Knudsen & Sons/Smucker's
Made In Nature
Organic Ingredients
Purepak, Inc.

Authorized Signature

Quality Assurance International

Received by OM
MAR 15 2001

Certificate of Compliance

Certified Organic

NUMBER 98009

CERTIFIED ENTITY J.R. Wood, Inc.
7916 W. Bellevue Road
Atwater, CA 95301

CERTIFIED PRODUCTS Per Attached Schedule

IDENTIFICATION MARKS Per Attached Schedule

PRODUCT ORIGIN Certified Entity's Facility

EFFECTIVE 03/09/98 To 03/08/99

Quality Assurance International, upon providing this certification, states that it has received the Certified Entity's application, reviewed its records, inspected its fields and/or facilities; and has determined that the products identified above are organically grown and/or processed and/or handled in accordance with applicable standards and statutes.

In its acceptance of this certification, the Certified Entity warrants, that it is in, and will remain in, full compliance with the Terms and Conditions of the Certification Agent; and all applicable standards and statutes.

AUTHORIZED SIGNATURE

QUALITY ASSURANCE INTERNATIONAL
12526 High Bluff Drive • Suite 300 • San Diego, California 92130 USA • (619) 792-3531 • Fax: (619) 792-8665

CERTIFIED PRODUCTS AND IDENTIFICATION MARKS FOR J.R WOOD, INC

(CERTIFICATE NO. 98009)

PRODUCTS

Apple, Apple Juice, Apricot, Banana, Blueberry, Broccoli, Carrot, Cauliflower, Celery, Corn, Curry Sauce, Curry Vegetables, Grapes, Grape Juice, Green Beans, Nectarines, Oat Flour, Parsnips, Pasta, IQF Peaches, Peach Puree, Pears, Peas, Peppers, Plums, Potatoes, Primavera Sauce, Primavera Vegetables, Prunes, Rice Flour, Spinach, Squash, Strawberry, Sweet Potatoes, Turnips, Zucchini, Onions, Mango, Tomato, Barley Flour, Lentil Flour, Macaroni Flour, Basil Powder, Honeydew, Cantaloupe.

Baby Food - Apples & Blueberries, Apples & Mangoes, Apples & Plums, Applesauce, Carrots, Green Beans & Rice, Pears, Spinach Carrots, Summer Vegetables, Sweet Potatoes, Winter Squash, Peas, Peaches, Rice & Bananas, Pears & Strawberries, Plums, Bananas & Oatmeal, Apples & Bananas, Apples & Apricots, Vegetables & Pasta, Rice & Lentils, Peas & Rice.

Retail Labels
Nichirei
Nichiryu
Cascadian Farms
Vegetarian Cafe
Organic Baby
Mom's Organic Choice

Big Valley master case
Heinz / Earth's Best
Amy's Kitchen
Organic Ingredients
S. International
Purepak, Inc.
Ceres Organic
C.F. Fresh
Knudsen & Sons / Smucker's
Made In Nature

Authorized Signature

Quality Assurance International

DEPARTMENT OF HEALTH SERVICES
2151 BERKELEY WAY
BERKELEY, CA 94704-1011
(510)540-2800

April 10, 1996

Dajing Ji
J. R. Wood, Inc.
Pesticide Laboratory
P.O. Box 545
Atwater, CA 95301

Certificate No.: 1673

Dear Mr. Ji:

This is to advise you that the laboratory named above has been certified as an environmental testing laboratory pursuant to the provisions of the California Environmental Laboratory Improvement Act of 1988 (Health and Safety Code, Division 1, Part 2, Chapter 7.5, commencing with Section 1010).

The fields of testing for which this laboratory has been certified under this Act are indicated in the enclosed "List of Approved Fields of Testing and Analytes." Certification shall remain in effect until November 30, 1997 unless revoked. This certificate is subject to an annual fee as prescribed by Section 1017(a), Health and Safety Code, on the anniversary date of the certificate.

Please note that your laboratory is required to notify the Environmental Laboratory Accreditation Program of any major changes in the laboratory such as the transfer of ownership, change of laboratory director, change in location, or structural alterations which may affect adversely the quality of analyses (Section 1014(b), California Health & Safety Code).

Please note that the new regulations pertaining to environmental laboratories were adopted on December 5, 1994 and may be found in the California Code of Regulations, Title 22, Division 4, Chapter 19, Sections 64801 through 64827.

Your continued cooperation is essential in order to establish a reputation for the high quality of the data produced by environmental laboratories certified by the State of California.

If you have additional questions, please contact Amanda Vidal at (510) 540-2800.

Sincerely,

George C. Kulasingam

George C. Kulasingam, Ph.D., Manager
Environmental Laboratory
Accreditation Program

Enclosure

Oregon Tilth Certified Organic

11535 S.W. Durham Road, Suite C-1, Tigard, Oregon 97224
Voice (503) 620-2829, Fax (503) 624-1386

Certification Acknowledgement

This is to certify that

J.R. WOOD, INC.
7916 West Bellevue Road, Atwater, California 95301

has been certified organic by the Oregon Tilth Certification Program,

CLASS OP
Organic Food Processor/ Co-Packer

Certification Number CA-OTCO-CO-93-00023

J. R. Wood, Inc. has complied with the above Standards and Guidelines Class OP. The following organic product or products processed & sold during the stated year are:

Apples, Apple Juice, Apricots, Bananas, Blueberries, Broccoli, Carrots, Cauliflower, Celery, Corn, Grapes, Grape Juice, Green Beans, Nectarines, Oat Flour, Parsnips, Pasta, Peaches, Pears, Peas, Plums, Potatoes, Prunes, Rice Flour, Spinach, Squash, Strawberries, Sweet Potatoes, Turnips, Zucchini.

This plant has been inspected during the production year by an agent of the OTCO program to verify that to the best of our knowledge the standards and guidelines have been met.

Issued: January 4, 1997
Expires: January 3, 1998

Yvonne Frost
Certification Director

CALIFORNIA CERTIFIED ORGANIC FARMERS

hereby certifies that

MALLARD BEND FARMS
1581 Laurel Ave.
Atwater, CA 95301
managed by
Alan, Daniel, & John Pryor

meets the standards established for
ORGANICALLY GROWN
by CCOF and the provisions of the CALIFORNIA ORGANIC FOOD ACT OF 1990, during the period
April 1, 1997 - April 30, 1998
for the following operations:

1 Location: **7420 N. Central Ave, Winton, Northwest parcel**
Certified Since: **12/10/92** Acres: **9**
1997 Crops: **peaches**

2 Location: **7420 N. Central Ave, Winton; Northeast & parcel**
Certified Since: **12/10/92** Acres: **7**
1997 Crops: **fallow**

3 Location: **7420 Central, Winton, southwest parcel**
Certified Since: **7/27/95** Acres: **7**
1997 Crops: **almonds**

Date Issued: 5/1/97

CERTIFICATION PROGRAM COORDINATOR

Certificate Number
bv041
Page 1

CERTIFICATION STANDARDS COMMITTEE CHAIR

California Certified Organic Farmers CCOF ™

Standards and documentation available from the CCOF Statewide Office:
1115 Mission St. Santa Cruz CA 95060 (408) 423-2263

RECEIVING STATION COPY

WEIGHMASTER CERTIFICATE

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

WEIGHED AT:

☒ J.R. WOOD, INC. P.O. BOX 545 • 7916 W. BELLEVUE ROAD • ATWATER, CA 95301 • PHONE (209) 358-5643

☐ P.O. BOX 850 • 1117-K STREET • SANGER, CA 93657 • PHONE (209) 875-3354

☐ _____

Received by OMRI MAR 15 2001

RECEIVED FROM (GROWER) John Pryor DATE 7-5-97

ADDRESS _____ TIME 5:00 PM

PRODUCT Organic Lodel HAULER _____ TIME _____

DELIVER TO Diamond Fruit

VEH. LIC. 4L82112 TRAILER LIC. _____ TRAILER LIC. _____ DRIVER John

TOTAL FULL BINS	WT. IN LBS.		TOTAL LBS. CONTAINER TARE WEIGHT
BINS 8	CT 13	JRW B1 =	1048
BINS _____	CT _____	JRW B2 =	
BINS _____	CT _____	JRW B3 =	
BINS _____	CT _____	JRW B4 =	
PALLETS _____	CT _____	CODE =	
BOXES _____	CT _____	CODE =	
NO. EMPTY BINS _____		BOX PALLET-BIN TOTAL TARE	1048

J.R. Wood, Inc.
WEIGHMASTER

WT. IN LBS.

GROSS WEIGHT 15140 by _____ DEPUTY

VEHICLE TARE 5400 by _____ DEPUTY

TOTAL WEIGHT FRUIT & CONTAINERS 9740

BOX-PALLET-BIN TOTAL TARE 1048

TOTAL WEIGHT OF FRUIT 8692

DOCKAGE —

NET PAY WEIGHT OF FRUIT 8692

SAMPLE SIZE _____ SAMPLE POUNDS GRADED 50

OFF GRADE

	POUNDS	PERCENT
1 DECAY & WORMS	1 1/2	3
2 CULLS GENERAL		
3 GREEN		
4 OVER RIPE		
5 SMALL		
6 OTHER (SPECIFY) _____		
TOTAL		3

PERCENT OF DOCKAGE —

GROWER NO. _____

VARIETY NO. _____

PRICE CODE 1

TICKET NUMBER 489240

PRODUCE RECEIVING AND GRADING REPORT

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301. 209 358-3643

J.R. WOOD LABORATORY JULY 16,1997
CERTIFICATE OF ANALYSIS

Sample Description: PEACHES

Date : 7-11-97

Lot No: na
Code: na TIME: 7:05 AM
Sample Description: ORGANIC FRESH PEACHES

	POTASSIUM LEVEL
WHOLE, RAW UN-PEELED	1053.0 ppm
PEELED HALVES TRIM LINE	891.0 ppm
SLICED, BLANCH	630.0 ppm
FINISHED IQF PEACHES	628.0 ppm

Sample Description: NON ORGANIC FRESH PEACHES

Lot No: na
Code: na

WHOLE, RAW UN-PEELED	1167.0 ppm
PEELED HALVES TRIM LINE	985.0 ppm
SLICED, BLANCHED	1153.0 ppm
FINISHED IQF PEACHES	1110.0 ppm

Tested Method: AOAC(14th edition) 22.031
Perkin-Elmer ANALYSIS OF FOODSTUFFS (FP-1)

Signature Lab Manager: 7-11-97

J.R. WOOD INCORPORATED
P.O. Box 545
Atwater, CA 95301

F A X C O V E R S H E E T

DATE:	June 26, 1997	TIME:	2:30 PM
TO:	Yvonne Frost Oregon Tilth	PHONE: FAX:	(503) 620-2829 (503) 624-1386
FROM:	Danny Galatro DG J.R. Wood, Inc.	PHONE: FAX:	(209) 358-5643 x227 (209) 358-9701
RE:	Organic IQF Peaches		
CC:			

Number of pages including cover sheet: 7

Message Research 1994 - 1997

1) Steam Peeling

In August of 1989, J.R. Wood used an atmospheric steam cooker / peeler on conventional peaches, in an effort to peel without the lye solution. J.R. Wood uses the steam peeler for vegetables such as carrots and potatoes. The peaches were washed and sorted as usual. Peaches by-passed the lye tank and were diverted in batches into a batch cooker. The batch cooker uses steam under pressure to heat the exterior of the product. J.R. Wood adjusted the dwell time from 30 seconds to 60 seconds, to 75 seconds and finally 90 seconds. After cooking for the designated period, the peaches were emptied onto the screw conveyor which feeds a Magnusson scrubber. The Magnusson scrubber removes the peel using fresh water and bristle brushes.

Results:

30 seconds	Peel still on 75%
60 seconds	Some peel still on 35%
75 seconds	Some peel still on, flesh significantly damaged
90 seconds	Little peel evident, much flesh destroyed

After 75 seconds, the peaches weighed approximately 60% of their starting weight. This weight still included the pit. Normally, IQF peaches weigh 65% of starting weight, after peeling and pitting.

Experiment was halted due to poor recovery and excessive damage to flesh. Note there was some peel remaining at 90 seconds. Bristle brushes cause too much damage to flesh while removing skin. Skin does not come readily free until peach is well cooked. Over cooking may contribute to flesh damage.

2) Steam Peeling II

In the summer of 1990, J.R. Wood conducted another steam peeling experiment using different brushes in a different Magnusson scrubber. These brushes are much finer and are the usual brushes used to peel lye treated peaches. The experiment was conducted with conventional peaches. The peaches were sorted and washed in the usual manner. Peaches were collected in batches and put into the batch steam peeler. Dwell time started at 60 seconds with progression up to 120 seconds. Peaches were collected in buckets as they emerged from steam peeler. Buckets were hand carried to the Magnusson scrubber (with fine brushes). Peaches were dumped into Magnusson scubber.

Results:

60 seconds	Peel still on Peach
75 seconds	Peel still on Peach
90 seconds	Peel still on Peach Peach becoming soft
120 + seconds	Peel coming off 55% Peach becoming soft and dripping

Experiment halted due to texture breakdown. The fine brushes were unable to remove peel until peach was extremely over cooked.

3) Slip Skinning

In the summer of 1991, an organic yogurt company from Europe began working with an organic peach grower George Noroian of Dinuba, CA. The yogurt company wanted an IQF 3/8" diced organic peach for use in it's yogurt. George Noroian operates a small scale canning operation, in addition to growing organic peaches. Noroian uses an old hand peeling method known as slip skinning. Noroian grows two old varieties of peaches (White Nectar and the regular Elberta) that work especially well with slip skinning. The slip skinning process works as follows:

Peaches are left on trees until overripe (by freezing standards). Peaches are picked in small picking boxes (30 lbs. each), instead of normal fruit bins which hold 1,000 lbs. Small boxes are used because the overripe peaches will bruise and crush in larger quantities. Boxes are taken to cannery, which is located at the edge of the orchard. Boxes of peaches are dumped on a conveyor. Peaches travel on a conveyor to a cutting and pitting station. Workers pick up each peach, cut it in half and scoop out pit and pit fragments. The halves are placed with pit cavity down on a conveyor. The conveyor passes the peaches through a small steam tunnel. The steam tunnel cooks the skin with live steam. When the peaches emerge from the tunnel, workers wearing gloves pinch a portion of the skin and pull it away from the flesh. In most cases, the entire peel comes off. Peaches with some peel remaining, are hand peeled with a small knife.

This process works best with older varieties of peaches, when they have matured to overripe.

In July of 1991, George Noroian ran Elberta peaches through the slip skinning process at his cannery in Dinuba. The peeled halves were collected in plastic buckets with a chilled Vitamin C and water solution. The Vitamin C solution was used to prevent oxidizing until the peaches could be transported to the J.R. Wood plant. The peaches were transported in a refrigerated van to the J.R. Wood plant. The peach halves were dumped on a de-watering conveyor and fed to an urschell dicer. The dicer was set to make 3/8" dices. The diced peaches went into a soak tank for chilling and further Vitamin C treatment. The peaches emerged from the soak tank on a stainless steel chain conveyor and passed under knife blowers. The knife blowers force high volumes of air across the peaches removing excess moisture. The diced peaches then enter an IQF tunnel for freezing.

Results:

Stage I (dicer)	Peaches too ripe Irregular dicing, shredded peaches
Stage II (IQF Tunnel)	Peaches too ripe, dices froze together in single mass in tunnel

Experiment halted to prevent damage to IQF equipment. no diced peaches were produced that met USDA IQF Standards.

Experiment conclusion: In order for slip skinning to work raw peaches must be overripe (by freezer standards). Unfortunately, overripe peaches break down in dicing and slicing equipment. Overripe peaches have flesh that is too moist and stringy. This flesh condition prevents dicers from making uniform cuts. It also makes freezing pieces individually in a tunnel impossible.

After this experiment, J.R. Wood began searching for alternative equipment at various dealers and shows. As of February 1997, J.R. Wood has not found any potential processing equipment that may peel peaches without lye.

In 1995, J.R. Wood was contacted by the USDA regarding an ingredient list and processing aid list compiled by the NOSB, for submission to USDA. Ted Rodgers, of the USDA, was briefed about the peeling problem with peaches. J.R. Wood was advised that it was too late to add Potassium Hydroxide to the initial processing aid list. Mr. Rodgers expressed the opinion that if an industry leader such as J.R. Wood could not find an alternative means of peeling peaches, then the USDA would probably look very favorably upon including Potassium Hydroxide as a processing aid in the future.

In the summer of 1995, J.R. Wood conducted some tests to further bolster the prospects for including Potassium Hydroxide as a processing aid. Conventional peaches were gathered from the processing line prior to the lye tank. Peaches were ground up in a blender. A solution was prepared and the peaches were tested for N, P and K content. Specifically the Potassium content was recorded and this value was used as a control sample.

Conventional peaches were then gathered after the Potassium Hydroxide treatment and Magnusson scubber. The peeled peaches were ground up in a blender and a solution was prepared for testing. The Potassium content was recorded and compared to the control.

Results:

Potassium levels were identical in control sample and peeled peaches.

Conclusion: Test results would indicate that peeled peaches did not contain any residual of Potassium Hydroxide. As expected, Potassium Hydroxide is removed when the skin is removed. Potassium Hydroxide is further diluted with fresh water sprays in Magnusson scrubber.

*Note: 1) Sampled peaches used were conventional and my have had a foilar nutrient spray prior to harvest. this spray may have resulted in a higher level of K in the peach than in an organic peach.

2) Testing for K is a simplistic method for determining residue of Potassium Hydroxide. More expensive and precise testing would confirm results.

In the summer of 1997, J.R. Wood will repeat K tests on organic Cling peaches. Results should be available in late August.

CLOSING NOTES

J.R. Wood conducted all tests at it's own expense. J.R. Wood does not grow organic peaches. Until 1997, J.R. Wood did not buy or sell organic materials. J.R. Wood has worked strictly as a co-packer of organic products until 1997.

Since 1994, J.R. Wood has been advising organic peach growers not to plant additional organic acreage, as the organic peach puree market is saturated. Several organic growers have asked whether to continue with the orchards. The proceeds from

fresh marketing and puree contracts are not enough to keep the operations viable. None of these growers have varieties that will work at Noroian's cannery.

If there is no significant progress made with classifying Potassium Hydroxide as a processing aid specifically for producing IQF organic peaches in the next few months, J.R. Wood will be ethically bound to recommend that growers of organic peaches push the orchards out. Fresh returns without secondary income for processing, do not sustain conventional orchards or organic operations. California's organic peach growers need another value added outlet for their product. That outlet is IQF. IQF is not possible without Potassium Hydroxide.

Please contact Ron O'Bara for more information at: J.R. Wood, Inc.
P.O. BOX 545
Atwater, CA 95301
Phone - (209) 358-5643 ext. 216
Fax - (209) 358-9701

J.R. WOOD INCORPORATED
P.O. Box 545
Atwater, CA 95301

FAX COVER SHEET

DATE:	June 26, 1997	TIME:	2:30 PM
TO:	Yvonne Frost Oregon Tilth	PHONE: FAX:	(503) 620-2829 (503) 624-1386
FROM:	Danny Galatro DG J.R. Wood, Inc.	PHONE: FAX:	(209) 358-5643 x227 (209) 358-9701
RE:	Organic IQF Peaches		

CC:

Number of pages including cover sheet: 7

Message

Ron O'Bara thought that you should receive a copy of this letter for your reference. It has been sent to Jack Bojorques and Ojai Organics.

Also, I am in the process of sending you baby food labels for Organic Baby and Mom's Organic Choice. Be expecting them in the mail early next week.

FAXED
6-26-97

J·R·WOOD INC.

April 24, 2000

Mr. John Donahue
Director, Inspection Services
California Dept. of Food & Agriculture
1220 N Street]
Suite A 414
Sacramento, CA 95814

Dear Mr. Donahue,

The attached documents are submitted as additional evidence to my April 14, 2000 testimony in Visalia, CA regarding Potassium Hydroxide and the freezing of Organic Peaches. Please include this material in the comments that CDFA is forwarding it to USDA.

I will restate some of the key points of my testimony and cite the documents which support the statements.

1. The proposed rule allows the use of Potassium Hydroxide as a processing aid for everything "except the peeling of fruits and vegetables". As of this moment there is no alternative in existence that will allow the peeling of peaches in a firm ripe state. The firm ripe maturity is required for the production of IQF (individually quick frozen) sliced and diced peaches. Alternatives have been developed for apples and tomatoes. I propose the rule be more specific and exempt those fruits and vegetables for which alternatives exist today. Those without alternatives should be evaluated every 5 years by the USDA to determine if an alternative has been developed and that actual work is being done to develop an alternative. (See exhibit B on alternative peeling experiments).

2. Who uses IQF Organic Peaches? Bakeries, Ice Cream and Yogurt manufacturers all require firm fruit that will stand up to additional processing. They also require the fruit be available year round not just when it is available fresh. Several retail labels also require firm fruit that will not discolor and turn to mush when presented in a ready to eat fashion to the consumer (fruit salads, etc). (See customer list on page 2 exhibit A)

7916 WEST BELLEVUE ROAD • P.O. BOX 545 • ATWATER, CALIFORNIA 95301 • 209-358-5643
FAX: ADMINISTRATION 209-358-4197 FAX: PURCHASING 209-358-8497 FAX: TRAFFIC 209-358-3266

3. Peach growers need multiple uses and markets for their crops in order to survive and expand acreages. Organic Peaches from the U.S. are available in fresh form in the summer months only. Frozen and canned peaches are consumed year round. Without these other markets Organic Peach acreage will decrease. Certain growers are producing "processing" varieties only. These varieties are primarily Clingstone and are not consumed in fresh markets. Some organic baby food companies will buy peaches with a puree or juice stock maturity, but they only pay juice stock prices. You can not farm on juice stock returns. Without the freezing, alternative, organic clingstone peach growers will have no viable markets. Most organic freestone growers will also be negatively impacted.

4. Potassium Hydroxide is a true processing aid. It does not become part of the finished product. It is removed mechanically and placed into the waste stream. At J.R. Wood it is actually helping restore the PH of the waste water which becomes acidic after coming in contact with so many high acid fruit products such as peaches. It is important to note that the amount of Potassium Hydroxide used in no way is enough to counter act the acidity of the waste stream. Additional chemicals must be added to fully restore the water to its original PH. Potassium Hydroxide reduces the amount of the other chemicals used. (See Exhibit G)

5. Rules and Regulations regarding Organic Foods should encourage the production of Organic Foods not put roadblocks in the way. We want more sustainable agriculture to be practiced, therefore we need to make more of the markets that use the produce available.

6. What were the justifications for allowing Potassium Hydroxide in other organic products? What standards did they meet? No alternative? No residue? The current rule sets the bar higher for Organic Peach growers that for anyone else. Why? Let the rule be consistent.

Thank you for the opportunity to comment and submit data. If you have any questions regarding my testimony or please contact me at (209) 358-5643 ext. 216. Additional Exhibits have been attached showing the history of this issue at various levels.

Sincerely,

Ron O'Bara
Director, Organic Food Division

March 31, 2000

To: Mr. Bill Lyons
California Secretary of Agriculture
USDA

From: Roger Wood
Vice President
J.R. Wood, Inc.

Re: Effect of those standards on organic California cling peaches

The proposed rules for the USDA National Organic Program are currently open for public comment. The rules as written unfairly penalize California organic peach growers by denying them access to the Individually Quick Frozen (IQF) markets.

Specifically, the section dealing with the "National List" discriminates against California organic peach growers by prohibiting the use of potassium hydroxide to peel the skin of the peaches during processing.

The exception was created in 1991 in an effort to protect the interest of organic tomato growers and processors. Certain varieties of organic tomatoes can be steam peeled during processing. Steam peeling does not use synthetic chemicals and therefore was adopted as the methodology for organic processing for tomatoes. There was no data presented regarding the peeling of other fruits at the time. The rule was written exempting "fruits" instead of tomatoes.

Since the initial rule was adopted by the NOSB, a wide range of experiments were conducted by J.R. Wood in an attempt to find an alternative to potassium hydroxide. At this time there is NO method that peels peaches and results in a product that is useable for the typical IQF applications such as ice cream, baking, fruit salads, etc. Steam peeling, "slip skinning", enzyme peeling have all been tried at J.R. Wood and all have failed. The results of these tests have been submitted to various certifying organizations and government regulating bodies.

At this time the State of California allows potassium hydroxide and a significant market has been created. This will all end with the adoption of the current rule regarding potassium hydroxide.

The vast majority of organic peaches are grown in the San Joaquin Valley in California. The only alternative use for those peaches is puree if the IQF option is removed. The puree market is saturated and hundreds of thousands of pounds exist in current inventory. The fresh market takes freestone peaches only so cling growers do not have this organic marketing option.

We have offered to test alternative peeling methods every summer but have only been able to test options developed by J.R. Wood staff. There have been no other submissions. We continue to search for an alternative method and welcome other participants. The fact remains that there is no alternative for producing IQF sliced and diced organic peaches today.

It is crucial that we make a concerned effort to amend the exemption now. J.R. Wood, Inc. has been advised that growers and customer comments will not be enough to sway the officials in charge. We will need the participation of California and congressional officials to succeed.

Growers affected by rule
Pryor (clings)
Bukabs (clings)
Olson Brothers
Masamoto
Norian
Quinn

Customers affected by rule
Stonyfield Ice Cream
Cascadian Farms
Heritage Foods
Spectrum
Krofters
Pacific Fruit Processors
MJ Uren & Sons (Export)

Please contact Ron O'Bara at (209) 358-5643 ext. 216, who is our Director of Organic Processing for further information.

Research Int.

J.R. WOOD, INC.

FAXED
JUL 2 3 1998

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Kathleen Downey	Ron O'Bara
COMPANY:	DATE:
OMRI	07/08/98
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
(541) 343-8971	3
RE:	C.C.:
Calcium Hydroxide	Yvonne Frost, Joe Smiley, Rod Crossley

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Please forward this letter to Dr. Baker and distribute to all other OMRI members in the review process.

Thank you for your assistance.

Received by OMRI
MAR 15 2001

P.O. BOX 545, 7916 W. BELLEVUE ROAD
ATWATER, CA 95301
PHONE: (209) 358-5643, FAX: (209) 358-9701

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301, 209 358-5643

July 8, 1998

To: Dr. Brian Baker
c/o OMRI

From: Ron O'Bara
J.R. Wood Inc.

Re.: Organic Peach Peeling Alternative

Dr. Baker:

During the recent Gilroy meeting, you spoke with Trudy Finn, a representative of our Organic Foods Division. During that discussion, you inquired if we had tried Calcium Hydroxide as a peeling agent for peaches. Until this week, our food scientists had not tried Calcium Hydroxide because it is not regarded as fully soluble in water. We did conduct an experiment on Tuesday, July 7, 1998 using Calcium Hydroxide.

The experiment went as follows:

1. 6 lbs. of Organic Loadel Cling Peaches (John Pryor-grower) were picked and brought to the lab.
2. A solution consisting of 4% Calcium Hydroxide and 96% water was prepared and filled into a dump tray. The water was heated prior to filling.
3. The peaches were immersed into the solution for several minutes. This simulated the dwell time in our lye system at 195 F.
4. The peaches were removed from the tray and placed under running hot water.
5. The skin was massaged, by hand, to simulate the Magnusson rubber disc scrubbing action.

Results:

1. Some skin peeled, but not enough to continue to slicing and dicing.
2. The Calcium Hydroxide began to separate out of the solution during the immersion period.

Notes:

1. A 4% solution was used instead of the typical 3% Potassium Hydroxide because the Calcium Hydroxide is considered a weaker agent.
2. Normally we use 3% on Clings and up to 8% on Freestone.
3. The immersion in the tray is a more thorough exposure to the solution than the cascading and showering effect that actually occurs in our lye peeling process.

Conclusion:

1. Calcium Hydroxide is not fully soluble in water. If it can become suspended, it will require a larger solution to work. We estimate 10+%.
2. As long as it continues to separate, we will be unable to use it in our current misting system because the sediment will plug nozzles.
3. We have contacted our industrial supplier in an effort to determine if there are any other forms of Calcium Hydroxide that may be more soluble in water. As of the writing of this note, the supplier has not been able to locate any other form that might suit our needs.

Please contact me with any questions.

Sincerely,

Ron O'Bara
Director of Organic Operations

Organic Cling Peach Run

Tuesday, July 21, 1998

Pack 3/8" Diced Only J.R. Wood A Grade

3% Lye Solution

Virgin Soak Solution

*Note: Clings will be on the small side.

Need to pull samples for certification experiment.

Sampling Method as follows:

1. Record the amount of time it takes from when the first bin is dumped until the first peaches arrive at the trim line. Use that time as the interval to wait between pulling samples at the bin dump and then the same peaches when they reach the trim line.

   Example: Suppose we determine it takes 5 minutes for the first peach to make it from the bin dump to the trim line. Then we will wait to time of sampling as follows:

Bin #3 John Pryor Clings	Weight Tag # 555555	Picked July 8, 1998
Time of Dump	7:05 am	10 peaches pulled
Trim Line Sampled	7:10 am	2 lbs. pulled
Bin #6 John Pryor Clings	Weight Tag # 666666	Picked July 12, 1998
Time of Dump	7:13 am	10 peaches pulled
Trim Line Sampled	7:18 am	2 lbs. pulled

2. Pull 10 peaches from every 3rd bin as it is dumped. Write bin #, grower, grower weight tag number and pick date, time of sampling and number of peaches pulled on a blank bin tag and the master worksheet. Place Clings in plastic bag with the newly filled out bin tag. Deliver bags to Terri Hoff at R&D Lab.

3. After determining the length of time it takes peaches to reach trim line, pull 2 lbs. of peaches at the matching interval with the raw bins sample. Record bin #, weight tag, time and lbs. pulled on a blank bin tag. Place peaches and new tag in bag. Deliver bags to Terri Hoff at R&D Lab.

4. After peaches go through blancher, pull 2 lbs. of peaches at the matching interval. Record bin #, weight tag, time and lbs. pulled on a blank bin tag. Place peaches and new tag in bag. Deliver bags to Terri Hoff at R&D Lab.

5. Every 30 minutes pull 2 lb. sample of IQF Clings. Label time and lbs. of sample on a blank bin tag. Deliver bags to Terri Hoff at R&D Lab.

Lab Procedures:

10 peach samples of raw fruit must be divided in half. Do not combine sample times. Each time must be tested individually.

5 of the 10 sample peaches are to be tested for their potassium content.

The remaining 5 are to be peeled by hand w/o chemicals and then tested for their potassium content.

The samples from the trim line and IQF are to be tested for Potassium content. Do not combine samples. Composites will not be accepted.

LIST OF SUPPLIES NEEDED

1. 35 5 lb. bags
2. 70 2 lb. bags
3. 100 blank bin tags (see below)
   Bin #:_____
   Grower:_____
   Weight Tag: _____
   Picking Date:_____ _____
   Time of Dump:_____
   Peaches pulled:__ _____
4. 100 blank bin tags (see below)
   Bin #:_____
   Weight Tag: _____ _____
   Time of Trim Line Sample:_____
   LBS. pulled:_____
5. 100 blank bin tags (see below)
   Bin #:_____
   Weight Tag: _____
   Time of Blancher Sample:_____
   LBS. pulled:_____
6. 100 blank bin tags (see below)
   Time of IQF Sample:_____
   LBS. pulled:_____
7. 4 sets Rubber Gloves

Interval Between
First Dump and Trim Line: 10 min.

Interval Btwn Trim and Blancher: 4 min.

ORGANIC CLING PEACH RUN

TUESDAY, JULY 21, 1998

MASTER WORKSHEET

Bin #	Grower	Weight Tag	Picking Date	Time of Dump	Size of Sample (10 peaches)	Time of Trim Line Sample	Size of Sample (2#)	Time of Sample (after blancher)	Size of Sample (2#)
3	Pryor	513303	07/18/98	8:04	10	8:14	2#	8:14	2#
6	Pryor	512407	07/08/98	8:15	10	8:25	2#	8:29	2#
9	Pryor	512850	07/13/98	8:27	10	8:37	2#	8:41	2#
12	Pryor	512407	07/08/98	8:41	10	8:51	2#	8:55	2#
15	Pryor	513303	07/18/98	8:55	10	9:05	2#	9:09	2#
18	Pryor	512407	07/08/98	9:12	10	9:22	2#	9:26	2#
21	Pryor	512850	07/13/98	9:23	10	9:33	2#	9:37	2#
24	Pryor	512407	07/08/98	9:28	10	9:38	2#	9:42	2#
27	Pryor	513218	07/17/98	9:34	10	9:44	2#	9:48	2#
30	Pryor	512964	07/14/98	9:47	10	9:57	2#	10:01	2#
33	Pryor	512765	07/12/98	9:56	10	10:14	2#	10:18	2#
36	Pryor	512964	07/14/98	10:15	10	10:25	2#	10:29	2#
Break									
39	Pryor	512850	07/13/98	10:56	10	10:06	2#	11:10	2#
42	Pryor	512850	07/13/98	11:08	10	11:18	2#	11:22	2#
45	Pryor	512850	07/13/98	11:15	10	11:25	2#	11:29	2#
48	Pryor	512959	07/14/98	11:23	10	11:33	2#	11:37	2#
51	Pryor	512959	07/14/98	11:31	10	11:41	2#	11:45	2#
54	Pryor	512959	07/14/98	11:41	10	11:51	2#	11:55	2#
57	Pryor	512959	07/14/98	11:50	10	12:00	2#	12:04	2#
60	Pryor	512959	07/14/98	11:55	10	12:05	2#	12:09	2#
63	Pryor	512850	07/13/98	12:03	10	12:13	2#	12:17	2#
66	Pryor	512407	07/08/98	12:10	10	12:20	2#	12:24	2#
69	Pryor	512850	07/13/98	12:20	10	12:30	2#	12:34	2#
72	Pryor	512765	07/12/98	12:28	10	12:38	2	12:42	2#
75	Pryor	512756 *	07/12/98	12:37	10	12:47	2#	12:51	2#
78	Pryor	512407 *	07/08/98	12:42	10	12:52	2#	12:56	2#
30 bins total (minus 1 redump)									
2 bins may have been missed at time of break									

Interval Between
First Dump and Trim Line: 10 min

Interval Btwn Trim and Blancher: 4 min

ORGANIC CLING PEACH RUN

TUESDAY, JULY 21, 1998

MASTER WORKSHEET

8:00

Bin.#	Grower	Weight Tag	Picking Date	Time of Dump	Size of Sample (10 peaches)	Time of Trim Line Sample	Size of Sample (2#)	Time of Sample (after blancher)	Size of Sample (2#)
~~3~~	~~Pryor~~	~~512765~~	~~7-12-98~~	~~8:04~~	10				
3	Pryor	513303	7-18-98	8:04	10				
6	"	512407	7-8	8:15	10				
9	"	512850	7-13	8:27	10				
12	"	512407	7-8	8:41	10				
15	"	513303	7-18	8:55	10				
18	"	512407	7-8	9:12	10				
21	"	512850	7-13	9:23	10				
24	"	512407	7-8	9:28	10				
~~27~~	~~"~~	~~512756~~	~~7-12~~		~~10~~				
27	"	513218	7-17	9:34	10				
30	"	512964	7-14	9:47	10				
33	"	512765	7-12	9:58	10				
36	"	512964	7-14	10:15	10				
39	"	512850	7-13-98	10:56	10				
42	"	512850	7-13	11:08	10				
45	"	512858	7-13	11:15	10				
~~48~~	~~"~~	~~512850~~	~~7-13~~		~~10~~				
48	"	512959	7-14	11:23	10				
51	"	512959	7-14	11:31	10				
54	"	512951	7-14	11:41	10				
57	"	512959	7-14	11:50	10				
60	"	512957	7-14	11:58	10				
63	"	512856	7-13	12:03	10				
66	"	512407	7-8	12:10	10				
69	"	512850	7-13	12:20	10				
72	"	512765	7-12	12:28	10				
75	"			12:37	10				
78	"			12:42	10				

(190) total

Received by OMRI
MAR 15 2001

not counting sample

Org Cling Run Wrksht

Interval Between
First Dump and Trim Line: 10 min

Interval Btwn Trim and Blancher: 4 min

ORGANIC CLING PEACH RUN

MASTER WORKSHEET

TUESDAY, JULY 21, 1998

Bin #	Grower	Weight Tag	Picking Date	Time of Dump	Size of Sample (10 peaches)	Time of Trim Line Sample	Size of Sample (2#)	Time of Sample (after blancher)	Size of Sample (2#)
3				8:04		8:14	✓		
6				8:13		8:25	✓		
9				8:27		8:37	✓		
12				8:41		8:51	✓		
15				8:55		9:05	✓		
18				9:13		9:23	✓		
21				9:23		9:33	✓		
24				9:28		9:38	✓		
27				9:34		9:44	✓		
30				9:47		9:57	✓		
33				9:56		10:06	- down - start up 10:14		
36			Restart -	10:15		10:25	✓		
39			Break	10:56	Restart	11:06	✓		
42				11:08		11:18	✓		
45				11:15		11:25	✓		
48				11:23		11:33	✓		
51				11:37		11:47	✓		
54				11:41		11:51	✓		
57				11:50		12:00	✓		
60				11:55		12:05	✓		
63				12:03		12:13	✓		
66				12:10		12:20	✓		
69				12:20		12:30	✓		
72				12:28		12:38	✓		
75				12:31		12:47	✓		
78				12:42		12:52	✓		
81									

Received by OMRI
MAR 15 2001

Interval Between
First Dump and Trim Line: 10 Mins 8:14

Interval Btwn Trim and Blancher: 4 Mins Y.R

ORGANIC CLING PEACH RUN

TUESDAY, JULY 21, 1998

MASTER WORKSHEET

Bin #	Grower	Weight Tag	Picking Date	Time of Dump	Size of Sample (10 peaches)	Time of Trim Line Sample	Size of Sample (2#)	Time of Sample (after blancher)	Size of Sample (2#)
3				8.04		8.14		8.18	
6				8.15		8.25		8.29	
9				8.27		8.37		8.41	
12				8.41		8.51		8.55	
15				8.55		9:05		9.09	
18				9.12		9.22		9.26	
21				9.23		9.32		9.37	
24				9.28		9.38		9.42	
27				9.34		9.44		9.48	
30				9.47		9:57		10:01	
33				9:52	Break down	10:14		10:18	
36		Break		10.15		10.25		10.29	
39				10:56		11:06		11:10	
42				11:08		11:18		11:22	
45				11:15		11:25		11.29	
48				11.23		11.33		11:37	
51				11.31		11:41		11:45	
54				11:41		11:51		11:55	
57				11:50		12:00		12:04	
60				11:55		12:05		12:09	
63				12:03		12:13		12.17	
66				12:10		12:20		12.24	
69				12:20		12:30		12.34	
72				12.28		12:38		12.42	
75				12:37		12:47		12:51	
78				12:42		12:52		12:56	

ATTN: Trudy

#1's (69) or Juice (23)

Bins

~~4~~ ~~513218~~

~~6~~ ~~512964~~

~~12 9 10~~ ~~512765~~ ~~32~~

~~13 10 13~~ ~~512407~~ ~~3~~

~~27 15+12~~ ~~512850~~ ~~12~~

~~15 15~~ ~~512959~~ ~~15~~

33

~~6~~ ~~513303~~

83 TOTAL

ORG. Peach Planting Rum

BIN #:_____

WEIGHT TAG:_____

TIME OF TRIM LINE SAMPLE:_____

LBS. PULLED:_____

BIN #:_____

WEIGHT TAG:_____

TIME OF TRIM LINE SAMPLE:_____

LBS. PULLED:_____

BIN #:_____

WEIGHT TAG:_____

TIME OF TRIM LINE SAMPLE:_____

LBS. PULLED:_____

ORGANIC CLING PEACH RUN 7-21-1998

GROWER	BIN NUMBER	PICK DATE	TAG NUMBER	TIME	UN PEELED PPM	Potassium HAND PEELED PPM	TIME	TRIM LINE PPM	TIME	BLANCHER PPM	TIME	IQF PPM
PRYOR	3	7/18/98	513303	8:04	411	630	8:14	616	8:18	431		
	6	7/8/98	512407	8:15	626	803	8:25	698	8:29	287	8:45	305
	9	7/13/98	512856	8:27	421	584	8:37	787	8:41	328		
	12	7/8/98	512407	8:41	564	998	8:51	613	8:55	357	9:20	299
	15	7/18/98	513303	8:55	774	687	9:05	695	9:09	368	9:50	350
	18	7/8/98	512407	9:12	580	802	9:22	775	9:26	485		
	21	7/13/98	512850	9:23	799	645	9:33	771	9:37	646		
	24	7/8/98	512407	9:28	661	530	9:38	819	9:42	385	10:20	321
	27	7/17/98	513218	9:34	598	664	9:44	609	9:48	352		
	30	7/14/98	51296	9:47	581	529	9:57	733	10:01	370		
	33	7/12/98	512765	9:56	733	765	10:06	578	10:18	594	10:42	482
	36	7/14/98	512964	10:15	747	615	10:25	630	10:29	304		
	39	7/13/98	512850	10:56	753	740	11:06	586	11:10	389	11:25	448
	42	7/13/98	512850	11:08	543	530	11:18	774	11:22	402		
	45	7/13/98	512805	11:12	596	657	11:25	704	11:29	392		
	48	7/14/98	512959	11:23	845	756	11:33	674	11:37	485	11:55	346
	51	7/14/98	512959	11:31	796	865	11:41	657	11:45	438		
	54	7/14/98	512959	11:41	606	636	11:51	529	11:55	415		
	57	7/14/98	512959	11:50	596	497	12:00	674	12:04	338	12:25	318
	63	7/13/98	512850	12:03	450	389	12:05	593	12:17	535		
	66	7/8/98	512907	12:10	711	673	12:20	679	12:24	459	12:42	367
	69	7/13/98	512850	12:20	579	590	12:30	541	12:34	424	12:51	377
	72	7/12/98	512765	12:28	585	685	12:38	596				
	75			12:37	560	804	12:47	701				
	78			12:42	766	714	12:52	490	12:56	512		
				average	635	665		661		422		361

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301, 209 358-5643

May 28, 1998

Kathleen Downey
OMRI Executive Director
Box 11558
Eugene, OR 97440-3758

Dear Ms. Downey:

Thank you for the update on OMRI's direction with Potassium Hydroxide. I have included information regarding Potassium Hydroxide and our waste treatment system. Several questions relating to the handling of the waste from the peach peeling process surfaced at the recent COFAB meeting. Hopefully this documentation will provide assurance to your committee with regards to our ability to handle our wastewater. Also attached is a fax copy from Cascadian Farms correcting some misinformation presented at the COFAB meeting.

While reviewing the documents, please note the following points:

J.R. Wood Inc. treats all of its processing wastewater. We do not let it go down the drain and become the City of Atwater's problem. Our plant is not connected to the city sewer system.

1. Our process includes an anaerobic digester/bio-mass system, which produces electricity in addition to treating the water.

2. The amount of potassium hydroxide we use each year is not enough to compensate for the volume of fruit solids and resulting high acidity of the waste water. We must supplement the potassium hydroxide with ammonia in order to restore the wastewater pH to neutral. Environmental disasters such as Lindsey Olive had just the opposite problem (i.e. too much salt and a pH in the non-acidic range).

3. In 1996, the State Water Resources Board approved a large expansion of our treatment process. This expansion requires 6 monitoring wells be in place in order to look for the slightest changes if any to our local groundwater. Limits were set on the amount of treated water we could irrigate our cropland with. The limits were designed to approximate dairy use. The amount of treated water allowed under these guidelines will not sustain the current crops, so we must irrigate with additional water from surface and/or ground sources.

4. Ray Green, with COFAB, made several calls to corroborate these documents. He addressed the COFAB meeting on May 20, 1998 and shared his corroborative information. Please contact him to verify his research or obtain a copy of the minutes.

5. Our system produces clean electricity, recharges the local aquifers and reduces the use of ditch and well water in our farming operations.

I would like to make a presentation to your review committee, summarizing our testing. I can also have our technical people available to answer questions on the material. Please contact me with any questions.

Sincerely,

Ron O'Bara
Director of Organic Operations

cc: Yvonne Frost, Oregon Tilth
Griff McLellan, QAI
Rod Crossley, COFAB

Mailed 5-28-98

J.R. WOOD, INC.

FAXED 5/18/98

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Mr. Ray Green	Ron O'Bara
COMPANY:	DATE:
CDFA	05/18/98
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
(916) 654-0666	12
RE:	C.C.:
Organic Peaches	

☑ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Attached is a memo with two "Exhibits" that I would like COFAB members to have. I realize this is last minute, but I believe it will make an impact on those who take the time to read it. As I mentioned in the memo, David Hoff, VP and myself, will attend Wednesday morning and make ourselves available for all questions. Please distribute as best you can.

I also need the address and directions to the meeting. Please send the information to me at (209) 358-9701.

Thank you for your assistance.

P.O. BOX 545, 7916 W. BELLEVUE ROAD
ATWATER, CA 95301
PHONE: (209) 358-5643, FAX: (209) 358-9701

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301, 209 358-5643

May 18, 1998

To: California Organic Food Advisory Board
C/O Ray Green

From: Ron O'Bara
J.R. Wood Inc.

Dear Board Members:

Recently I received a copy of a memo from Zea Sonnabend (Exhibit 1) regarding J.R. Wood, Inc. and its petition to use Potassium Hydroxide. After reading the memo, I concluded that the author and some of the quoted sources did not have some crucial information that J.R. Wood, Inc. has developed over the past eight years. Although most of the issues raised in the memo have been addressed previously, I am including more detailed information for the Board's review.

I. First, a history of the review process.

A) When the NOSB has reviewed Potassium Hydroxide on previous occasions, it has done so without any data from J.R. Wood Inc. During previous reviews, J.R. Wood Inc. was conducting experiments using steam peeling for peaches. The hot commodity, with regards to Potassium Hydroxide, has usually been tomato.

Attached (Exhibit 2) is a memo from Richard Theuer inquiring as to whether criticism the NOSB Processing, Handling and Labeling Committee received for not consulting the industry was valid. J.R. Wood Inc. replied via telephone and confirmed that we had not been consulted or contacted about any organic processing issues. Since we were packing the entire Earth's Best strained product line at that time, as well as processing several million lbs. of frozen ingredients for other organic industry leaders, we felt the NOSB reviews were incomplete without input from J.R. Wood Inc. However, our customers were happy that the process was moving forward, so J.R. Wood Inc. did not pursue the matter. The important point is that the original NOSB reviews were not as thorough as they should have been and therefore their opinions should not always be taken as gospel, especially with the amount of time that has passed since the reviews.

Subsequent to our confirmation to Richard Theuer about lack of contact, J.R. Wood Inc. was contacted by Ted Rogers at USDA and Rod Crossley of the NOSB to discuss processing matters. J.R. Wood Inc. participated in some conference calls during the period when USDA was preparing the Organic Rule for publishing. During this period (1995-1996), I updated various contacts with our test results (failures). Towards the end of 1996, I began suggesting that Potassium Hydroxide may need to be reconsidered for use in producing organic frozen peaches, since the alternative methods were proving incapable of producing usable product.

In January of 1997, J.R. Wood Inc. began requiring it's organic customers to commit in advance for processing time for the coming year. J.R. Wood Inc. requires the commitment by the end of March in that same year. In early April 1997, after reviewing our customer commitments, J.R. Wood Inc. recognized that a permanent oversupply of Organic Peach Puree would occur during the summer of 1997. An alternative use needed to be found for these peaches.

I contacted Rod Crossley at NOSB and informed him that the organic peach peeling issue was about to become critical. I asked what the proper procedure would be to get Potassium Hydroxide reviewed, given that all other peeling alternatives had been exhausted. I also asked that a target date coinciding with Expo East 1997 be set for the process to be complete. There needed to be adequate marketing and development time prior to 1998 harvest. Rod suggested that J.R. Wood Inc. conduct an additional test with neutral observers present before submitting our petition. This experiment was conducted during the summer of 1997 and the results, along with background material, were presented to the NOSB Processing, Handling and Labeling Committee. The committee voted 4-2 to submit the reconsideration to the full NOSB. The committee also sent additional questions to J.R. Wood Inc., which were promptly responded to. The Board has all of this information in the J.R. Wood Inc. packet.

A short time after the committee voted, the Fed published its proposed rules for organics and submitted them for public comment. I believe everyone is familiar with the industry's disappointment and subsequent mobilization to get the proposal amended or withdrawn. NOSB made the Fed rules it's priority and informed me that it would not take any action on my petition prior to Expo East 1997. I tried to get a commitment by Expo West 1998, but was unsuccessful.

In late January 1998, with Expo West rapidly approaching, I again inquired about NOSB action. NOSB priority remained with the Fed rules and no action was contemplated prior to Expo West 1998. At this point, I decided that NOSB was unlikely to do anything in time to help the growers for the 1998 crop year.

Just prior to the Natural Show in Anaheim, I contacted several industry leaders asking for input. It was suggested that since the majority, if not all of the organic processing peaches are grown in California, that maybe the State of California would be more responsive to the needs of it's own. I was pointed in the direction of the COFAB materials sub-committee. I was also advised to submit my material to OMRI as well. The COFAB Materials sub-committee has forwarded the materials to you, the full state wide Board. I have provided

additional material to Ray Green, which has also been forwarded to you. I have not heard from OMRI since they received our materials.

II. Responses to Zea Sonnabend's memo and the negative criticism.

A) Bob Durst was cited as claiming that there were non-chemical alternatives and that suitable varieties could be found to support these alternatives.

I think J.R. Wood Inc. has proven that this claim is not true in the case of IQF organic peaches. Remember that ultimately we must manufacture a product that can be used by the pie maker, ice cream manufacturer, yogurt producer or retail customer. These customers all have standards with regards to texture, fruit identity, color, etc. If the standards cannot be met, they cannot make the product. In our steam peeling trials and later in the hand peeling trial, J.R. Wood Inc. produced 0 lbs. of acceptable fruit under USDA standards for frozen peaches. It is not a question of cost or recovery; it is a question of producing a usable product. I remind the board that we used two varieties that have been proven as suitable for hand peeling and they failed miserably. J.R. Wood Inc. handles over 50 varieties of peaches each summer. J.R. Wood Inc. works closely with 3 different nurseries in the development of new peach varieties. There are no varieties on the horizon that will lend themselves any better to non-chemical peeling. Most nurseries are breeding for fresh shipping characteristics. Fresh characteristics particularly durability in storage, work against non-chemical peeling.

B) Disposal of Lye can be dangerous.

The Board has copies of the J.R. Wood Inc. wastewater treatment program, as certified by the State Water Resources Board. Note this packet includes the Boards blessing to expand our system in 1996. A close reading of the documents shows that the amount of Potassium Hydroxide we use is insufficient to counteract the acidity that occurs in the wastewater due to fruit solid content. J.R. Wood Inc. must add ammonia to bring the pH back to acceptable levels. The sheer number of gallons of water treated combined with the tight restrictions for using this treated water for irrigation required J.R. Wood Inc. to include hundreds of acres of its crop land in the wastewater project. By requiring J.R. Wood Inc. to distribute the treated water in restricted quantities over such a large area, the State has made our system conform to the standards that a dairy operates under. The J.R. Wood Inc. system fits organic processing quite well. Not only do we produce electricity with this system, but we also recharge local aquifiers and reduce our own use of ground and surface water.

C) NOSB Issues

"Does allowing Potassium Hydroxide for lye peeling of peaches, open the door to more and more situations where non approved synthetic ingredients could be justified to be used where the technology of alternatives applications does not currently exist?"

In my opinion, that door was opened when Potassium Hydroxide was approved for manufacturing organic pretzels. The pretzel people demonstrated that pretzels could not be

produced without Potassium Hydroxide. The pretzel people demonstrated that there was no trace of Potassium Hydroxide in the finished product.

The peach people have demonstrated the same points. In addition, the peach people have shown that hydroxide does not come in contact with the finished peach product.

If the Board were to deny the petition for peaches, would it be guilty of not applying the same standards that were used with pretzels? In the event of litigation would it be a defensible position?

There have been concerns raised about a bias that may exist with the materials presented by J.R. Wood, Inc. I thought the presence of neutral observers during the final testing would alleviate that concern. Apparently it has not convinced everyone. J.R. Wood Inc. believes that all Committee and Board members who review our data are capable of judging the facts and filtering out any unintentional bias. However, since the subject of bias has been raised, I would be negligent if I did not remind the Board of perceived cases of bias that previous national reviews appeared to contain. J.R. Wood, Inc. does not have any employees sitting on any board or committee in the organic industry. We have no vote. We have no extraordinary access to those who do vote. The same could not be said of an organic processor who had a vested interest in excluding chemical peeling for all fruits and vegetables, especially tomatoes during the initial review of Potassium Hydroxide years ago. I believe that bias still exists today. I also believe the board is capable of filtering it out as well.

D) Enzymes or cellulose processes.

J.R. Wood Inc. has conducted lab tests with the "NOVO" brand enzyme. This macerating enzyme is approved for use in producing organic apple juice concentrate. When used in conjunction with peeling conventional peaches, the lab results were so poor that plant trials were not conducted.

This test and others like it were not submitted with previous data because they disproved themselves at such an early stage and confirmed what the vendors of these potential alternatives have already said. "There is not an enzyme that will successfully peel peaches." More importantly, this test illustrates that the industry is testing alternatives, even when conventional wisdom says it cannot be done. In short, J.R. Wood Inc. is doing its homework.

E) Statements from Craig Weakly

1. "Residue"
   J.R. Wood Inc. is not proposing a residue standard for processing. Our testing demonstrated that Potassium Hydroxide did not "bleed through" the skin and come in contact with the finished peach flesh. The skin was treated with a diluted chemical and then removed mechanically. Adding Potassium Hydroxide to an item in its entirety (such as a sauce) and claiming it's organic because a residue could not be detected, is not what J.R. Wood Inc. is advocating. J.R. Wood Inc. is proposing that you can treat a part of fruit, which is not a part of the finished product and can be separated mechanically

without contaminating the final product. J.R. Wood Inc. advocates this position in the absence of non-chemical alternatives.

2. "Waste"
The Board has materials showing that our waste system is more than adequate to deal with any potential adverse consequences. J.R. Wood Inc. has processed peaches since 1967. There have been no waste disposal problems related to Potassium Hydroxide during that entire period.

3. "Alternatives to Lye"
Del Monte is a cannery, not a freezer. They have entirely different specs for their end users. J.R. Wood and Del Monte have bought and sold peaches from each other for years. While we can use the same varieties of peaches, we cannot harvest them the same way. We do not make the same finished product not do we serve the same end users. J.R. Wood Inc. cannot speak for what canneries can and cannot do. I have reported on Mr. Noroian's cannery and have used his fruit and peeling methods. They did not work for freezing.
J.R. Wood Inc. is asking for a very specific exemption when it comes to Potassium Hydroxide. We wish it to be allowed for the production of <u>frozen</u> organic peaches <u>only</u>. J.R. Wood Inc. would oppose its use in the peeling of apples, pears or tomatoes, regardless of its end use. J.R. Wood Inc. would also oppose its use for the production of canned organic peach halves. I ask the board to remember the following during their deliberations.

    1. Canning and freezing are two entirely different operations.

    2. Peaches and Tomatoes are two entirely different products.

III. Closing Comments

David Hoff, Vice President of J.R. Wood Inc., and myself will be attending the COFAB meeting on May 20, 1998. We will make ourselves available to the Board and public, in order to answer questions regarding our petition. I will also bring samples of canned organic peaches and IQF Peaches. The Board will be able to see first hand the differences. I have also received confirmation that some organic peach growers will attend and confirm inventory and contract status of their crops. I urge the Board to take decisive action. I urge you to support California Organic Peach Growers and the California Organic industry.

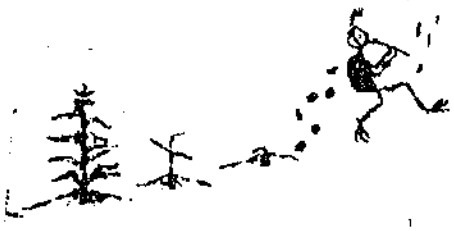
Please contact me with any questions or suggestions at (209) 358-5643 ext. 216 (phone) or (209) 358-9701 (fax).

Sincerely,

Ron O'Bara
Director of Organic Operations

Exhibit 1

pgs. 3



Zea Sonnabend
47 Linden Rd.
Watsonville, CA 95076
(408) 761-3213
fax (408) 761-8988
email: zea@well.com

FAX COVER SHEET

KOD

TO:

DATE: April 27, 1998

OF PAGES (incl. this one). 3

FAX NUMBER:

RE: Potassium Hydroxide regulation

Memo To: CA Organic Food Advisory Board
Organic Materials Review Community

From: Zea Sonnabend, gadfly

I understand that COFAB will be asked to consider a change to the Materials List for Handling which would allow Potassium Hydroxide (also known as lye) for peeling of peaches. This memo is designed to make decision-makers on this matter aware of as many issues as possible about this subject.

The NOSB reviewed this material at its regularly scheduled meeting in 1995 in Austin. There were three Technical Advisory Panel members submitting reviews for the material: Joe Mentecalvo, Rich Theuer and Bob Durst. All of them recommended that it be allowed as a pH contol agent (alkali) but not for peeling of fruits and vegetables. The NOSB adopted this unanimous recommendation and voted to add it to the National List as an alkali but prohibit it as a peeling aid

On July 31, 1997 it was brought back up to the Processing, Handling and Labeling Committee of the NOSB on a conference call. It was the only petition moved forward at that time even though others may have been submitted in the year or more since any such petitions were looked at. Information in favor of removing the prohibition to allow it to be used for peach peeling was submitted by J.R. Wood, the company which is interested in using it and which has been conducting tests to look at alternatives. On that call the committee voted 4 to 2 to submit it to the full NOSB for reconsideration. The minutes from the call bring up a number of concerns which should have been addressed by the time it reaches the board.

In early March of 1998 it was brought before the COFAB Materials Subcommittee. They also saw the information from the petitioner and agreed to forward it on the the full statewide board. Subsequently, the NOSB did not take up the issue and it remains prohibited by them.

Members of the CA Organic Foods Advisory Board must be responsible about how they conduct their materials review process to add anything to the state materials list. While there is not the same mandate as there is for the NOSB under the Organic Food Production Act (OFPA), there is the need for a defensible and consistent process on each material reviewed. This is even more critical if you wish to take a position which is different from the NOSB at this particular time, when the organic industry throughout the country is trying to promote using the NOSB recommendations as they currently stand.

Here are the basics of responsible materials review.
1). Give the same process to all petitioned items.

2). Use accepted criteria on which to base the review. There are some good ones in OFPA for a start.
3). Obtain information from expert sources but also from unbiased sources. While the petitioner has some good information and some interesting experiences looking for alternatives, they stand to gain from the use of the material and should not be the only information source. Use the equivalent of the Technical Advisory Panel to the NOSB to get information and opinions from people knowledgeable both about the actual material and about organic principles and practices.
4). Give sufficient public notice for all concerned parties to express their views. In this case, make sure this controversial item is noticed on your agenda for your next meeting.

Below is a summary of some of the concerns raised and negative opinions offered by various parties on potassium hydroxide. These should be weighed against the information presented in favor of the material and more detail sought on the unanswered questions brought out. These are presented more or less chronologically.

A). From the TAP review of Bob Durst, a food scientist at the Oregon State University, concerning restrictions or limitations that should be placed on the material:
"Should not be allowed for lye peeling; if this gets unrestricted approval, while expensive compared to sodium hydroxide, it would allow manufacturers to lye peel fruit. While there are non-chemical alternatives that can be used instead, these are either very labor intensive (expensive) or require a suitable fruit variety to work well. By encouraging the planting of suitable varieties and understanding that the organic product is going to cost more due to the added labor costs, there is no reason that the same range of non-organic products can't be produced organically."

B). Other points raised in the TAP reviews of Theuer, Durst and Monticalvo:
The substance is, "extremely corrosive, ingestion can cause hematemesis, collapse, stricture of esophagus, violent pain in throat and epigastrium."(Monticalvo, 1995)
"Disposal of spent lye can be disasterous environmentally"(Theuer, 1995).
"There is some concern about any alkali treatment of food products that are high in protein regarding the formation of lysinoalanine. Lysinoalanine ... lowers the protein availability of the essential amino acid (lysine), which can markedly reduce the nutritional value of the food" (Durst, 1995).

C). Issues raised on the NOSB processing committee call of July 31, 1997 (quoted from the minutes of the call):
"Does allowing potassium hydroxide for lye peeling of peaches open the door to more and more situations where non-approved synthetic ingredients could be justified to be used where the technology for alternative applications does not currently exist?"
"There should be alternatives to steam peeling, perhaps using enzymes or cellulase processes. Have these been explored yet as alternatives? Has the peach industry done enough homework?"

D). Statements from Craig Weakley, former NOSB member and now working for Cascadian Farm. Craig has extensive experience with processing fruits and vegetables.
"I think my position on lye peeling is clear. I am totally against it. It is chemical processing. Prohibition of chemical processing is one of the few distinctions between organic food processing and conventional food processing. I am against any compromise on this.
I don't buy any of the IR Wood arguments:
1. No residue on peaches - organic is not a residue standard, it is a production standard. We don't allow chemical processing in organic. We don't let growers spray pesticides and then call their crop organic if no residue is detected at harvest. Why should we allow a processor to use chemical processing and then claim the product is organic just because there is no residue?
2. NOSB allowed a variance for lye in pretzels - this variance is for the use of a synthetic material that is added to the food in minute quantities as a processing aid. Lye peeling uses large quantities of the synthetic material and such use has historically caused waste disposal problems. When used for peeling, lye is a chemical processing agent, not a processing aid that's used in very small quantities.

3. No waste disposal problem - I haven't seen JR Woods' proposal but have heard that they are claiming that they have a waste disposal system that has no environmental impact. I don't believe it. But obviously I need to see their proposal. They may be containing the lye waste on their property, but I doubt there is no environmental impact of the disposal. What other chemicals are they using to neutralize the caustic lye?

4. No alternative to lye - actually, there are two alternatives: 1) steam peeling - I know that Del Monte tried steam peeling of peaches years ago and then converted back to lye because recoveries were too low with steam peeling; 2) hand peeling which is practiced by the one guy in Fresno area (can't recall his name). JR Woods' argument here is really an economic argument - steam peeling and hand peeling are too expensive. We don't give growers a variance to use herbicides because hand hoeing is too expensive. There is no compromise (variance) on pesticide use by organic growers and there should be no compromise (variance) on chemical processing by organic processors. I would rather not have organic IQF peaches than allow chemical processing on organic processing standards.

In conclusion, I think allowing a variance for chemical processing of peaches with lye (or any other type of chemical processing) would set a very dangerous precedent for organic processing standards."

B). A few Concerns raised by OMRI

Is it wise to go against the position of the NOSB and the opinions of all of their Technical Advisors on this issue?

What is considered "ripe" for IQF peaches, and what is the nutritional value of such fruit compared to tree ripened fruit?

How much potassium hydroxide solution ends up as waste and what happens to that waste?

Exhibit 2

pgs. 3

Date: July 15, 1993

To: David Hoff - J. R. Wood
William Knutsen - Knutsen & Sons
William Knutsen - Earth's Best
Brice Lundberg - Lundberg Family Farm
Mark Retzloff - Natural Horizons
Boyd Foster - Arrowhead Mills
Paul Shaw - Walnut Acres
Andy Berliner - Amy's Kitchen
George Kalogridis - Ojai Organics
Myron Cooper - Westbrae

From: Richard Theuer - Beech-Nut

Copy: Craig Weakley - Muir Glen
Gene Kahn - Cascadian Farms

At the recent NOSB meeting in Cottage Grove, Oregon, Rod Crossley, speaking at the public input session, publicly castigated the NOSB Processing, Handling and Labeling Committee for not making personal contact with you, asking you for your points of view or otherwise consulting with you or soliciting your input. A copy of his statement is enclosed. Note that he purported to represent you, both directly by mentioning some of your companies and indirectly, by referring to "no one that I know of in industry".

I find this intensely frustrating and totally confusing.

It is frustrating to have spent scores of personal hours reading public comments, revising documents, and then making copies and stuffing envelopes to send to you for your input, and then to get this response. Over the past year I personally mailed surveys and documents to each of you, talked by telephone with a number of you and asked George as OFPANA MPPL Chair to relay faxes to you as well. Craig Weakley and Gene Kahn have done similar things, including holding a processing review session at Asilomar in January. We also scheduled our Committee meeting in Baltimore last September to coincide with EXPO-EAST, in order to make it easy for the organic industry to provide input.

It is confusing as well. The fact of the matter is that the Committee received excellent and timely comments from Mark, Andy and Paul on the Labeling Recommendation. These were discussed by the Committee in Oregon. [For your information, we agreed to reverse our position, and to advise that a front panel declaration of the percentage organic be prohibited.] Moreover, some of the substances ridiculed by Rod were taken directly from industry input.

I have two questions for you. Does Rod's statement <u>in its entirety</u> truly represent the industry position? Do you have suggestions to help us get more effective input.

Rich Theuer

Richard C. Theuer

HEALTH VALLEY FOODS
16100 FOOTHILL BLVD., IRWINDALE, CA 91706-7011 • (818) 334-3241

Address to NOSB Board July 8, 1993

Good day. My name is Rod Crossley and I am Director of Organic Operations for Health Valley Foods, Irwindale, California. We are a multi-line, multi-ingredient manufacturer of both conventional and organic foods. Our Company mission statement is "we only prepare good tasting healthy food that benefits people and our planet". You will note that we are concerned about both our customer and the environment. This concern is why we have made a commitment to convert our entire product line to organic as soon as possible. At the present time, the majority of our over 300 different products contains better than 50% organic ingredients.

During the 1993 production year, it is estimated that Health Valley will purchase around 75 million pounds of organic ingredients. This is up from the some 55 million purchased during 1992. The ingredients come primarily from the United States with wheat, oats and beans being imported from Canada. We have, however, in the past purchased organic ingredients from overseas and will do so in the future if the American and Canadian farmers can't meet out needs. These ingredients are certified by over 26 different state and private certification organizations. The total acreage involved is impossible to calculate, but it is the thousands of acres. Examples of the program may help you to understand it better. Our present fresh year-round organic vegetable program will demand over 4 million pounds of product broken down into over 3.0 million pounds of carrots; 800,000 pounds of celery; and over 200,000 pounds of potatoes. We are presently working with our growers on a fresh organic onion program which will add another million pounds to the total. The vegetable program is produced on a little over 4,000 acres of land throughout California and earns the 6 farmers and the intermediate processor involved a nice income. Our demand for wheat and oats is around 15 million pounds per year. At the present time, we are purchasing a majority of the organic soft pastry flour grown in the U.S.A. So you can see by the above that Health Valley is a major purchaser of the United States organic food crops. It is our plan to work more closely with our present growers and find new ones so that we can expand our organic program to ever greater volumes.

However, this expansion, indeed Health Valley's whole organic program, is threatened by this Board. As one of the major organic manufacturers in the industry Health Valley had expected to contribute our experience to the Board so that the final NOSB proposals would meet the needs of the industry and the organic community. This has not happened, the organic leaders Knudsen & Sons, Earth Best, Health Valley, Westbrae, Edan Foods, etc., and intermittent processors such as Grain Millers, J.R. Wood, etc., have had no personal contact with the Processor Sub-Committee. When asked about this, we have been told that you can comment on the draft proposal. This lack of interest on the industry input by the processor Sub-committee seems strange in light of the fact that the other Sub-committees have talked extensively to their industry prior to issuing of their draft proposal. During the past year, no one that I know of in the industry has had one phone call from the Committee asking about our opinion or view prior to draft proposals being released. Yet during that time the Committee has worked on the material list, labels and processor plans. It seems strange that the Committee which contains only 3 processors knows all there is to know about making bread, soup, cookies, cereal, juice, etc. Examples of the Sub-Committee's lack of input from the industry can be found in their label program. The majority of the Committee feels that those people with less than 50% of organic ingredients in their product must be fully certified

yet can only show the organic content of the product on the ingredients panel. How does this help the industry to grow when most manufacturers cannot justify the expense of full certification vs. the return on the product they are producing. There are ways to certify a manufacturer up to the time ingredients are mixed without a full certification. If the Committee had asked the industry they would have found how this could have been done.

This lack of concern for industry input is shown in the latest material draft dated June 14, 1993. There are items that appear in the synthetic list that are necessary to the industry, i.e. ammonia. While on the natural list are items that Health Valley, as a natural food company, cannot use due to the need for chemicals in their processing, i.e. corn sugar and whey protein isolate. In addition, some of the natural sources that you want us to use are so expensive and in such short supply that their cost will be prohibitive. If you restrict the type of ingredients that a manufacturer may use, one of two things will happen. The price of the product will be more than the customer will pay--or the processor will replace organic with conventional ingredients defeating what you are trying to do.

There is also concern within the industry that this Board will set processing standards that are impossible for manufacturing to comply with or that will prevent us from meeting FDA GMP standards. An example of this concern can be found in the movement within the Board to ban pythemims in area of pest control. This is the only thing that we can use in a water base solution for crack and crevice treatment.

We have been told by the Committee that they desire only written comments on draft proposals, which raises another area of concern. The industry has communicated as requested on each proposal as they are issued. However, there is no feedback from the Committee on our proposals. When the next draft is issued, there is the item you commented on in it's original form. This leaves one to feel that no one is reading your comments--let alone acting on them.

This Board is changed by the organic law and as outlined in the notes from the United States Senate to help establish and promote the United States organic industry. This seems to be done in most areas. However, in the area of processing this program does not seem to be going forward. Today is a very good example with both boards meeting at the same time. Health Valley requests that the NOSB instruct its processor Sub-Committee to work more closely with the industry. If they can't, then the industry may have laws that will not allow it to manufacture a product economically. If this should happen, what effect does NOSB feel this would have on the organic farmers of the United States and foreign countries.

Please, I ask you, talk to the industry. We have a vast array of knowledge and experience that can help the NOSB make suggestions to the secretary that are fair to the entire organic community. We want to work with you now, not fight with the secretary later.

Thank you.

Cascadian Farm
719 Metcalf Street
Sedro Woolley, WA 98284
Main (360) 855-0100 Fax (360) 855-0444

Direct to Steven Harper, Ph.D., Director of R & D and QA (360) 855-2724

Facsimile Message/Cover Sheet

To: Diane Goodman Date: 5/22/98
Attn:
Re: Potassium Hydroxide Processing of IQF Peaches

This is page 1 of 1 (Please call if you do not receive all pages transmitted).

Dear Diane,

As discussed in our telephone conversation last evening, 5/22/98, I feel that I my views were represented at the California Organic Foods Advisory Board Meeting on 5/20/98. Please amend the minutes of the meeting accordingly. Diane, the following three points reflect my position as discussed in our conversation on May 19.

1) I am neutral on the issue of the use of KOH for the processing of IQF peaches. This means that I am open to considering its use if no other ways of processing can be demonstrated and if environmental concerns are adequately addressed. I am opposed to the use of lye if an effective way of processing is demonstrated which does not require use of KOH.
2) I do not know of any other way of presently processing IQF peaches other than lye peeling.
3) I speculated that there may be varieties which are not grown in California which may have potential to be processed in an alternative way. However, I have no knowledge of any of these varieties at the present time and Cascadian Farm is not conducting any research in this area.

I hope that the misrepresentation of my views did not have a drastic influence on the final vote of this body. I am sending copies of this clarification to Rod Crossley, Ron O'Bara, Ray Green and Bryce Lundberg. Please give me a call if you have any questions.

Sincerely,

Steven Harper

Cc Rod Crossley Ron O'Bara
Ray Green Bryce Lundberg

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301, 209 358-5643

April 6, 1996

Mr. Ray Green
California Department of Food and Agriculture
California Organic Program
1220 N Street
Room A-447
Sacramento, CA 95814

Dear Mr. Green:

I am contacting you at the suggestion of several people in the organic industry. J.R. Wood Inc. has been working diligently for the past seven years to find additional outlets for organic peaches. The most promising outlet is IQF frozen peaches. IQF peaches could be used in ice cream, yogurts and mixed fruit. Unfortunately, after seven years of trying, the only way to produce a frozen organic peach (sliced or diced) is to peel the peach with lye (Potassium Hydroxide).

Currently, Potassium Hydroxide is a restricted material and not approved for peeling organic fruits and vegetables in general. The attached documents summarize the work that J.R. Wood, Inc. has been doing in order to manufacture an organic IQF peach. J.R. Wood believes that an exemption or variance should be made for the manufacture of organic IQF sliced and diced peaches. I want to emphasize that the variance is for frozen peaches only. Potassium Hydroxide should be allowed as a "processing aid" for the manufacture of organic IQF peaches.

As you can see from the attached documents, I have been trying to get some movement from various organizations, NOSB, OMRI, etc. I am a novice when is comes to politics, but I know our factory operates in California and CDFA should be involved. I also know that it is the California organic peach growers who will suffer the most without this relief. Some knowledgeable people in the industry think you are a critical element in this process. Please look over the enclosed information. I will be in touch shortly. I would appreciate any suggestions or help you could provide in this matter. If you have any questions, please contact me at (209) 358-5643 ext. 216.

Sincerely,

Ron O'Bara
Director of Organic Food Division

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301, 209 358-5643

April 6, 1998

Kathleen Downey
Executive Director
OMRI
Box 11558
Eugene, OR 97440-3758

Dear Ms. Downey:

Thank you for answering my questions about OMRI at the Anaheim Natural show tabletop. Per Bill Wolf's suggestion, I am sending you the background materials I have accumulated regarding peeling peaches with Potassium Hydroxide and subsequently freezing them. J.R. Wood Inc. strongly believes that Potassium Hydroxide should be allowed as a processing aid (specifically a peeling agent) for IQF Organic Sliced and Diced Peaches. Bill Wolf indicated that I should get these supporting materials to you so that OMRI could formulate a definitive position regarding the issue.

First a little background on J.R. Wood Inc. J.R. Wood Inc. is the largest freezer of peaches in the world. It is a privately held family corporation. J.R. Wood Inc. farms approximately 4,000 acres in the Central Valley of California. Most of the acreage is planted in peaches. None of the peaches are organically grown. J.R. Wood Inc. operates processing facilities in Atwater, CA, Sanger, CA and Guatemala. J.R. Wood Inc. has been processing organic products for various customers since 1988. Oregon Tilth and Quality Assurance International currently certify the facilities. Some of the organic items that J.R. Wood Inc. manufactures include: IQF vegetables, frozen fruit purees, baby food, pasta sauces, fruit juice concentrates and soups. Our customer list includes many of the leaders in the organic industry. That list includes: Amy's Kitchen, Cascadian Farms, Earth's Best baby food, Health Valley, Knudsen & Sons, Mountain Sun, Ojai Organics, Organic Food Products and Organic Ingredients. Organic processing has grown to account for nearly ten percent of the operations and sales at J.R. Wood Inc.

J.R. Wood is committed to producing the highest quality organic foods. We strive to fulfill our customers needs. We also value our growers and their concerns. It is precisely our concern for our growers and desire to serve our customers that has brought the

Mailed 4-6-98

Organic IQF Peach issue to the foreground. As you review the attached materials, please keep in mind the following items.

1. There is a great demand for Organic IQF Peaches.

2. Other than fresh shipping and puree, there is no other approved use for the current acreage of organic peaches.

3. There is a glut of organic peach puree inventory today. Cascadian Farms has puree on it's surplus list, Organic Ingredients has offered to relinquish it's current organic peach grower contracts, J.R. Wood Inc. has it's 1998/99 peach puree requirements for baby food on hand already and Earth's Best has peach puree for sale as well.

4. Organic peach growers are facing severe, if not ruinous, prospects for the summer 1998, if no home (market) can be found for this year's peaches. Puree is not an option.

5. J.R. Wood Inc. is proposing that the exemption be for IQF Peaches only.

6. J.R. Wood Inc. has shown that the use of Potassium Hydroxide in freezing peaches meets the same criteria that was used to justify it's use in the manufacturing of organic pretzels. Specifically, A) Edible IQF Peaches cannot be manufactured without it's use and B) The processing aid is removed before the completion of the finished product and no traces of the aid were absorbed in the finished product.

7. Finally, J.R. Wood Inc. proposed a rigid testing procedure for all organic IQF peaches that are produced. The test procedure would test finished product each hour code and verify no residual aid is present and / or absorbed.

Thank you for you consideration. Please contact me with any questions or suggestions.

Sincerely,

Ron O'Bara
Director of Organic Operations

c.c. Bill Wolf ✓
Ray Green ✓

Organic Materials Review Institute

Policy on Status of Generic Materials

OMRI Generic Materials Policy

The Organic Materials Review Institute Board of Directors voted unanimously at their January 25, 1998 Board meeting that:

> OMRI will use the strictest standards to resolve unresolved materials issues. If the National Organic Standards Board takes a position, then OMRI will defer to the NOSB recommendation. The OMRI Generic List will annotate those differences where the NOSB position was not the highest standard.

Status of Potassium Hydroxide

Regarding the recent question of the status of potassium hydroxide for use as a processing aid for IQF peaches, the processing materials section of the current OMRI generic materials list states:

> OMRI Status: Regulated
> OMRI Class: Processing Production Aid
> NOSB Syn/Non: Synthetic
> Name of Material: potassium hydroxide (lye)
> Annotation: May not be used in lye-peeling fruits or vegetables or where non-synthetic sodium carbonate is an acceptable substitute.
>
> NOSB: S, A. Prohibited for use in lye peeling of fruits and vegetables and where non-synthetic sodium bicarbonate is an acceptable substitute (Austin, 1995).
>
> The NOSB Processing Committee discussed the need for potassium hydroxide in the production of IQF peaches at their July 31, 1997 meeting and decided to submit "potassium hydroxide to the Board for reconsideration as an allowable synthetic material of lye peeling of peaches."

The recent NOSB meeting in March 1998 in Ontario, California did not address this material. Therefore, OMRI currently retains the NOSB's ruling from the Austin meeting.

OMRI's Action on Potassium Hydroxide

OMRI and its Advisory Council have not yet reviewed the new data related to the use of potassium hydroxide for peeling IQF peaches. However, one of OMRI's subscribing certifiers has requested that we review the material for this specific use.

Now that the comment period on the USDA's proposed rule is over, OMRI's 19-person Advisory Council is able to refocus its attention on the work of reviewing generic materials. OMRI's Advisory Council was chartered to receive requests for information about generic materials from subscribing certifiers, to research materials' physical and chemical properties, and to review materials for compatibility with organic systems. Due to the organic industry's current interest in potassium hydroxide, OMRI plans to expedite its own review of this product.

If OMRI's conclusion on this material differs from the NOSB's position from the 1995 Austin meeting, then OMRI will post this as an interim position. OMRI will then submit a petition to the NOSB asking for review of potassium hydroxide for peeling IQF peaches. OMRI will also submit technical information in support of its conclusion in order to assist the Technical Advisory Panel and the NOSB.

OMRI • Box 11558 • Eugene, OR 97440-3758 • 541-343-7600 • fax 541-343-8971 • omri@efn.org

(C)

orig

J.R. Wood Incorporated
P.O. Box 545
Atwater, CA 95301

Fax Cover Sheet

DATE:	August 12, 1997	TIME:	2:15 PM
TO:	Rod Crossley	PHONE: FAX:	(818) 248-8323 (818) 541-0976
FROM:	Danny Galatro J.R. Wood, Inc.	PHONE: FAX:	(209) 358-5643 x227 (209) 358-9701
RE:	Peach Processing		
CC:	Ron O'Bara		

Number of pages including cover sheet: 2

Message

In response to your recent fax regarding the lye peeling of peaches, I have spoken with our plant manager to answer your questions. I have attached the flow chart of the process for your review. The length of time the peach is in the lye solution is 1 1/2 minutes. It is a 5% solution checked hourly. Different varieties of peaches do not require different solutions. The lye solution is kept at 195 F.

These are all variables and will change to meet different conditions. The fruit temperature at time of processing, etc. will change the dwell time in the solution, the percentage of the solution, etc. if you require any other information or I did not completely cover the issues, please let me know. I will get a more detailed explanation to you.

Sincerely,

Danny Galatro

FAXED
8-12-97

5

Rene Marcos

August 11,1997

TO: ~~Ron O'Bara~~
FROM: Rod Crossley
SUBJECT: Peach Peeling

During an NOSB Processor Committee conference call on July 31,1997 your report on the peeling of organic peaches with Potassium Hydroxide was reviewed. The committee discussed the need to use this chemical in the peeling of peaches and the failure of earlier tests using steam peeling. It was also noted that Codex allows the use of both Potassium and Sodium Hydroxide under certain conditions. After the discussion the committee voted to send a report to the NOSB Board recommending the use of Potassium Hydroxide in the peeling of peaches. The federal law requires the NOSB to review their materials decision every five years which will give the industry time to explore other methods of peeling.

The committee wishes to expand its understanding of the subject so that we can make a stronger presentation to the entire board. Would you please answer the following questions?

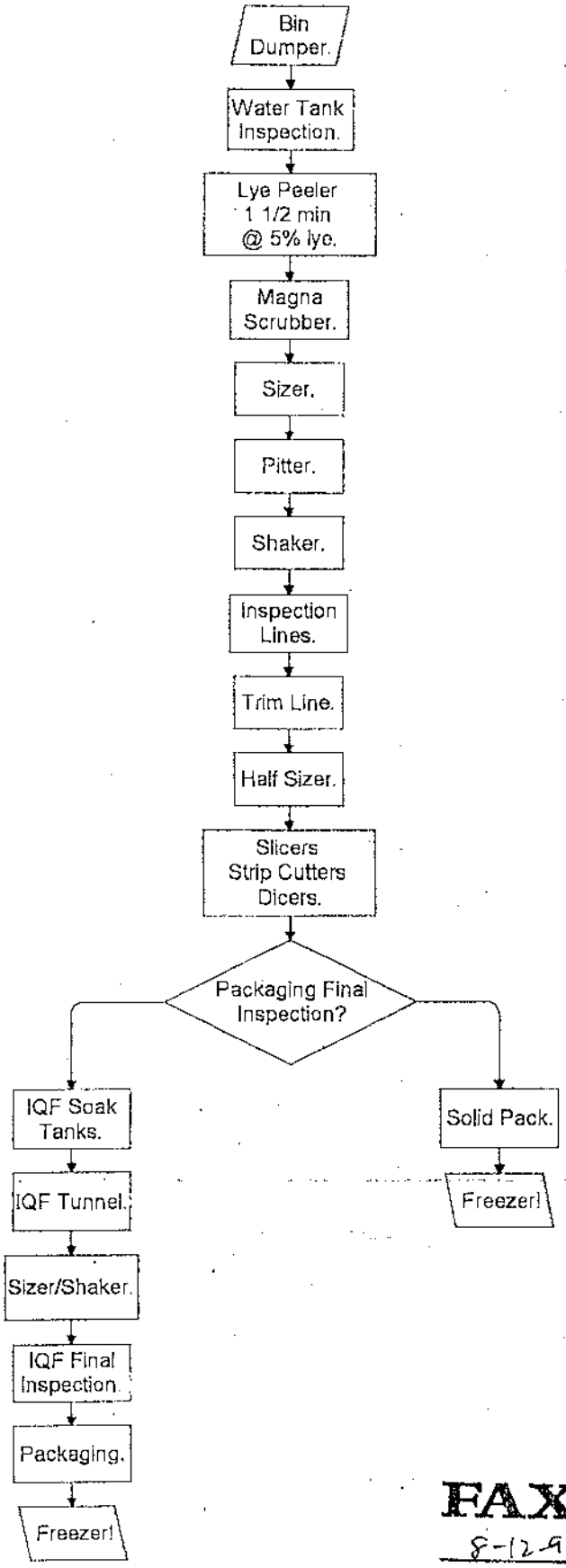
1. The length of time that the peaches are in the potassium hydroxide solution. - 1 to 2 min
2. The concentration of potassium hydroxide solution during the production run. How often is solution checked (½ hour) and when do you add more? Are different solutions used for different varieties of peaches? (5% lye)
3. A basic flow chart from the bin dump to the sizing operation, showing the basic time the peaches are in each stage and what is happening at each stage.
4. Explain the reason why the concentration of potassium hydroxide climbs following the pitting operation.

1) 1-3 min. Depending on lye Concentration, Fruit Temp & lye temp

2) Hourly to 2 Hours. Freestones 3-8% Depending on Peeling Characteristic No.

3)

Peach Processing



J·R·WOOD INC.

Org (3)

Date: July 16, 1997

To: George Kalogridis
Ojai Organics

From: Ron O'Bara
J.R. Wood, Inc.

George,

Attached are the J.R. Wood lab results for the Organic Peach peeling experiment conducted on Friday, July 11, 1997.

Summary of Experiment

John Pryor a certified Organic peach grower sold J.R. Wood, Inc. several tons of Organic Loadel Cling peaches. Certification and weight tags attached. J.R. Wood invited Rod Crossley of the NOSB to be present for the experiment. J.R. Wood had a USDA representative on site to officially draw the samples. USDA letter attached.

At shift start (7:00am) we dumped two organic bins onto the processing line. The USDA rep pulled the samples of raw peaches from the inspection line just after the rinse tank. No other peaches were dumped for five minutes to create a controlled gap.

The USDA rep went inside the processing plant to the trim line and waited for the organic peaches to go through the potassium process, Magnusson scrubber, sizer, pitter and the trim line. The USDA rep pulled samples from the trim line and then went to the next station. The peaches went through slicers and then a water blancher. More samples were collected after the blancher. The peaches went into a chill tank with Ascorbic acid and then into an IQF tunnel. The last sample was pulled after the peach was frozen.

The samples were taken to the J.R. Wood Analytical Lab where they were prepared for analysis. Rod Crossley suggested we repeat the process several hours into the shift to determine if any residue was building up in the plant. The experiment was repeated at 10:45am. This period was selected because it was 15 minutes prior to lunch break and the plant does some limited sanitizing and rinsing during lunch break. If there was any residue it should peak at this period.

The analytical lab prepared samples for in house testing and sent for an independent lab to confirm results. The in house results were fairly predictable. Sample 1 (the raw organic peach) had the highest potassium content. This is the naturally occurring potassium in the peach. After peeling the peaches with a potassium hydroxide solution the peaches actually had a lower potassium level. This indicated that there was no uptake of potassium hydroxide and that some of the naturally occurring potassium was removed with the peel. I will forward the independent results when they are available. Hopefully Friday or Monday.

7916 WEST BELLEVUE ROAD • P.O. BOX 545 • ATWATER, CALIFORNIA 95301 • 209-358-5643
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It appears we have a processing aid scenario similar to the pretzel exemption for potassium hydroxide . Remember we are talking about IQF and solid pack organic sliced and diced peaches only.

Feel free to share this information with whom you think is necessary.

Sincerely,

Ron O'Bara

USDA

United States Department of Agriculture

Marketing and Regulatory Programs

Agricultural Marketing Service

Fruit & Veg. Div.
Processed Prod. Br.
2202 Monterey St.
Suite 102-A
Fresno, CA
93721-3175

J.R. Wood, Inc.
7916 Belleview Rd
Atwater, CA

July 15, 1997

On July 11, 1997 the USDA drew eight samples at J.R. Wood, Inc.

At 7:05 AM 2 bins marked "John Pryor Organic Loaded 07-05-97 #489240" were dumped into the line. Four samples were drawn as follows:

Day Code 2192701

Sample 1	(Fresh Peaches)	10 pounds taken after dump tank
Sample 2	(Halves)	10 pounds taken after trim line
Sample 3	(Slices)	10 pounds taken after blanchers
Sample 4	(IQF)	20 pounds finished product

At 10:45 4 bins, each with separate markings, were dumped into the line. The bins were marked -

Bin 1 - "Yagi Carson Cling 07-10-97 #489378"
Bin 2 - "Nakashima Carson Cling 07-10-97 #489380"
Bin 3 - "John Pryor Organic Loaded 07-05-97 #489240"
Bin 4 - "Dairy Block 48 Stanislaus Cling 07-10-97 #489361"

Four Samples were drawn as follows:

Day Code 2192704

Sample 1	(Fresh Peaches)	10 pounds taken after dump tank
Sample 2	(Halves)	10 pounds taken after trim line
Sample 3	(Slices)	10 pounds taken after blanchers
Sample 4	(IQF)	20 pounds finished product

Samples were labeled and taken to research lab at the plant. The inspector watched the samples divided and a portion of each sample labeled and packaged for shipment to a private lab.

Tony Giannetta
Area Supervisor

CC: Y. Kagawa
R. Villaluz

USDA

"Petition Justification statement"

Caustic Potash should be allowed as a processing aid to peel peaches during the production of IQF (Individually Quick Frozen) organic peaches. There is simply no alternative, organic or otherwise that will produce finished product in accordance with well established industry specifications and consumer expectations.

Currently Caustic Potash (Potassium Hydroxide) is on the National list as a processing aid "except for the peeling of fruits and vegetables. " This prohibition against peeling on all fruits and vegetables is too broad and ignores the significant physical differences between commodities as well as their end use markets. We agree that most vegetables and tomatoes can be steam peeled. We also acknowledge that there are mechanical methods for peeling apples and pears. However there is no method for Organic peaches.

J.R. Wood, Inc. along with other interested parties have aggressively tested many different methods for peeling peaches since 1988. All have failed. J.R. Wood, Inc. has successfully lowered the percentage of Caustic Potash required in a hot water solution while maintaining an effective peeling process.

J.R. Wood, Inc. has also demonstrated that there is no residual in the finished product. In addition those fruit processors who treat their own wastewater instead of dumping to a municipal treatment system derive a benefit from the residual in the waste stream. Processors who treat their own wastewater are required by state government to restore the wastewater to its original EC and BOD ratings prior to returning for use. Fruit by its nature has a high acid content. Water used in processing fruit becomes acidic. The Caustic Potash present in the water helps lower the acidity. The Caustic Potash contributes a small counterbalance but it does reduce the need for other chemical treatment to restore the water to its original EC.

After twelve years of trying to find an alternative, it is time to amend the prohibition against peeling for IQF peaches. After reviewing the accompanying research I am confident you will act to amend prohibition on the materials list.

Respectfully submitted by J.R. Wood, Inc.

ADDENDUM #2

WASTEWATER TREATMENT, DISPOSAL, AND RECLAMATION

AT

J.R. WOOD FACILITY, ATWATER

April, 1996

ECO:LOGIC Engineering
2220 Douglas Blvd., Suite 220
Roseville, California 95661

Purpose of Addendum #2

The purpose of Addendum # 2 is to provide the Regional Board with specific information that it has requested in the course of preparing revised Waste Discharge Requirements (and related California Environmental Quality Act analyses) for the expanded J.R. Wood food processing water reclamation system.

Specific information requested to supplement and/or amend previous information submitted includes:

- More detailed analysis of salt application and crop uptake issues in the context of the Regional Board's "Dairy Guidelines."
- Revised reclamation areas, crops, and facilities based on reclamation system changes implemented by J.R. Wood in 1995.
- Revised projections of BOD loads applied to the reclamation areas based on continued use of the existing digester and aerated ponds.
- Revised water, salt, and BOD balances based on the foregoing analyses and revisions.

Salt Application and Uptake Issues

The Regional Board's "Dairy Guidelines" under the "Waste Load Balancing" section cites University of California guidelines as indicating that salt can be applied to land up to 2,000 lb/ac/yr in excess of the salt uptake of the harvested portion of the crop being grown without threatening the quality of the underlying groundwater.

The University of California, Davis, was contacted to get estimates of salt uptake and removal via harvesting of the specific crops grown on the J.R. Wood reclamation areas. The University salt numbers, references, and implications for the J.R. Wood facility are presented in Appendix A2-1. Using the lower crop yields (i.e., less salt removal by harvesting) to be conservative, the allowable waste salt loads to the reclamation areas are as presented in Table A2-1.

Revised Reclamation System Facilities

The present J.R. Wood food processing water reclamation system consists of the following elements:

- Influent pH adjustment facilities using ammonia to raise the pH of the food processing water, when necessary, to ensure stable, non-acidic (i.e., non-odorous) operation of the anaerobic digester.
- An anaerobic digester.
- Three aerated treatment ponds operated in series.

- Two aerated effluent storage ponds.
- Crop lands using the reclaimed water for irrigation and fertilizer needs.

Influent pH Adjustment. Reportedly, the J. R. Wood food processing water can have a pH below 7 (at times) because of the natural acids in food, e.g., citric acid. When this occurs, ammonia is added to the water prior to its entry into the anaerobic digester to prevent acid conditions in the digester. Acid conditions in the digester can result in odors when the digester effluent enters the aerated pond system.

Anaerobic Digester. The anaerobic digester has a theoretical liquid volume of about 3 million gallons (MG). Its effective liquid volume is estimated to be about 2 MG by J. R. Wood staff as a result of solids accumulation. Digester performance was modeled empirically based on the 1993 and 1994 J. R. Wood operating data. Using an effective volume of 2 MG, the first-order kinetic treatment rate, "k_d", for the digester during the critical June through October period ranged from 0.03/day to 0.47/day (see Appendix 2A-2). The average and median k_d values were 0.15/day and 0.11/day, respectively.

Based on the summer (and to a lesser extent non-summer) data, an appropriately conservative (i.e., roughly 90th percentile) kinetic treatment rate for the digester is estimated to be about 0.06/day. This treatment rate was used in estimating the future treatment performance of the digester. A temperature correction for summer versus winter conditions was not made because digester performance appears to be impacted much more greatly by influent wastewater characteristics than any effect that could be attributed to temperature. Additionally, the digester is covered and insulated by earth such that significant shifts in digester temperature should not occur.

The outputs of the digester are 1) partially treated water (which flows to the aerated treatment ponds), and 2) gas (which is flared). The flared gas contains carbon, nitrogen, and other elements. The nitrogen removal of this mechanism is not thought to be significant from a reclamation perspective. This is because the J. R. Wood staff reports that when checked, nitrogen concentrations entering and leaving the digester were not substantially different, i.e., nitrogen removed with the gas was roughly equivalent to the nitrogen added to the digester as ammonia for pH control.

Aerated Treatment Ponds. The aerated treatment pond system consists of three approximately equal volume aerated ponds operated in series, i.e., effluent from the digester flows through the first pond, then through the second pond, and then through the third pond. The total volume of the pond system averages out to approximately 1.35 MG per pond. The system has aeration equipment that is adjusted to maintain dissolved oxygen concentrations in the ponds at 1.0 mg/L, or more, per State requirements to control potential odor production in the ponds.

The aerated treatment pond system was modeled empirically based on the 1993 and 1994 J. R. Wood operating data. The first-order kinetic treatment rate, "k_p", for the pond system during the critical June through October period ranged from 0.028/day to 0.301/day (see Appendix 2A-3). The average and median k_p values were 0.10/day and 0.08/day, respectively. Based on the summer (and to a lesser extent non-summer)

data, an appropriately conservative (i.e., roughly 90th percentile) kinetic treatment rate for the pond system is estimated to be about 0.04/day under summer conditions.

Because the ponds are open to the atmosphere and are aerated via atmospheric oxygen transfer, the ponds will cool in winter. Based on a typical aerated pond temperature coefficient of 1.037, a 14°C (25°F) decrease in average pond system temperature from summer to winter translates into a 40 percent decrease in kinetic treatment rate from summer to winter; thus, a conservative summer k_p of 0.04/day would reduce to 0.024/day in mid-winter, i.e., January.

To model effluent BOD concentrations from the pond system, a summer value of 0.04/day was used and ramped down to 0.024/day for mid-winter and ramped back up to 0.04/day for the following summer.

Aerated Storage Ponds. Two aerated effluent storage ponds were added to the reclamation system in 1995: Pond 4 with 14.2 MG and Pond 5 with 32.3 MG. To obtain maximum effluent storage from these ponds and to have at least three feet of water in the pond to allow operation of the aerators (to control odor production potential by maintaining dissolved oxygen concentrations of 1.0 mg/L, or more), the operational strategy for the ponds is as follows:

- In August when the storage ponds first need to be operational (see Table A2-2), the lower three feet of Pond 4 will be filled with well water (about 2 MG) so that the aerators are operating when effluent from Pond 3 first enters Pond 4 for storage.

- In August, all of the reclaimed water not used immediately for irrigation will be stored under aerated, aerobic conditions in Pond 4. At the end of August, up to about 10 MG of water will be stored in Pond 4 above the minimum 3-foot deep pool necessary for aerator operation (i.e., about 12 MG of water, total).

- When Pond 4 contains about 10 MG of effluent (i.e., the volume above the minimum pool), roughly 7 MG will be transferred quickly to Pond 5 such that the Pond 5 aerators can be started essentially immediately in treated water that has been under aerated storage in Pond 4 for an average of about 2 weeks.

- After the foregoing water transfer is made from Pond 4 to Pond 5 and the aerators are operating in both ponds, effluent from Pond 3 can be placed in Pond 4, Pond 5, or Pond 5 via Pond 4.

- When the stored water is being reclaimed, it will be drawn from Pond 5, first, because of its greater depth and volume. When Pond 5 water levels are drawn down to where it is planned to take Pond 5 out of service, the water levels in Ponds 4 and 5 will be drawn down together until there is about 7 MG in Pond 5 and 3 MG in Pond 4 (above the minimum pool, i.e., 5 MG total). When this balance is reached, the Pond 5 water will be pumped to the reclamation areas and to Pond 4 such that Pond 5 is drained quickly to avoid protracted low water conditions that would risk odors and mosquito breeding.

- The water in Pond 4 will be reclaimed, as needed, down to the minimum pool depth. At this point, the reclamation areas will be dried out sufficiently to allow the 2 MG volume remaining in the minimum pool to be pumped quickly to the reclamation areas. This strategy avoids protracted low water conditions that would risk odors and mosquito breeding.

With this approach, the storage ponds have an effective effluent storage volume of approximately 38.9 MG based on the water use strategy presented in the detailed water balance for the reclamation system (see Table A2-2). The effluent storage need of the water balance is approximately 30.4 MG (see Table A2-2). The "surplus" storage capacity will give the J. R. Wood operations staff flexibility and a factor of safety in the day-to-day operation of the reclamation facility.

Crop Lands. The current and foreseeable acreages and crops that are part of the reclamation system are tabulated in Table A2-3 and are shown in Figure A2-1. The nitrogen needs of the reclamation system crops and acreages are presented in Table A2-4. These acreages and crops are used in the detailed water balance (see Table A2-2).

Revised BOD Load Projections

At the request of the Regional Board staff, the BOD concentrations in water used for reclamation have been reduced to reflect the substantial reduction in BOD accomplished by the digester and aerated pond system. The projected effluent BOD concentrations leaving the digester and aerated pond system under the proposed process flows and BOD concentrations are presented in Table 2A-5. These projections are based on the treatment kinetic rate estimates discussed earlier. These effluent BOD concentrations are used in the water balance (Table 2A-2) for analysis of compliance with the Regional Board guideline for BOD load to crop reclamation areas. That guideline is that BOD loads be kept below 100 lb/ac/day.

Revised Water, Salt, Nitrogen and BOD Balance

The detailed month-by-month assessment of wastewater flows, rainfall, crop irrigation and nutrient needs, salt applications and accumulations, and BOD loads is presented in Table A2-2.

What is shown in Table A2-2 is that the reclamation system can handle a total volume of the projected food processing water of about 144 million gallons. With this quantity and quality of water:

- Salt applications stay within "Dairy Guidelines" for the specific J.R. Wood reclamation crops based on minimum crop yields (see Table A2-1).

- Nitrogen applications are less than crop needs (thus, some supplemental fertilization of the reclamation areas will be necessary).

- BOD applications are well below the 100 lb/ac/day guideline recommended by the Regional Board.

- Crop water needs are substantially greater than the volume of reclaimed water available (thus, groundwater and/or surface water will be used to supplement the reclaimed water to meet crop water needs).

Table A2-1

ALLOWABLE WASTE SALTS LOAD PER THE "DAIRY GUIDELINES"

	J.R. WOOD SYSTEM DATA		CROP WATER CONTENT, %	ESTIMATED MINIMUM HARVEST, dry ton/ac•yr	UCD ESTIMATE OF SALT UPTAKE	ESTIMATED MINI SALT HARVES lb/ac•yr
	ACREAGE, ac	HARVEST, wet ton/ac•yr				
Peaches	135.16	25-30	~86	3.5	5.3% of dry harvest weight	371
Grapes	14.11	11-12	—	—	≥20.8 lb per wet ton harvested	229
Sudan Grass	141.28	30-32	~90	3.0	~300 lb/dry ton harvested	900
Winter Oats	141.28	10-12	~90	1.0	~300 lb/dry ton harvested	300
TOTAL						

* Estimated minimum salt removed via crop harvest plus 2,000 lb/ac•yr per the "Dairy Guidelines."

(a) Sudan grass and winter oats are grown on the same parcels: Sudan grass May to October, winter oats from November to April.

Table A2-2

DETAILED WATER BALANCE AND NITROGEN, SALT AND BOD LOAD ASSESSMENT

PARAMETER	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	TOTAL
AVG. RAIN, IN	0.0	0.0	0.2	0.5	1.3	1.7	2.1	1.9	1.7	1.2	0.3	0.1	11.0
1-25 YR RAIN, IN	0.0	0.0	0.3	0.9	2.5	3.2	4.1	3.7	3.2	2.3	0.6	0.2	21.0
WASTEWATER CHARACTERISTICS:													
VOLUME, MG	2.10	23.0	22.0	17.8	12.3	8.0	4.0	6.1	3.8	6.3	7.4	15.0	143.6
BOD_5, mg/L	2100	1000	3700	2000	1500	1700	500	1800	800	900	1500	1100	—
EFF BOD, mg/L (a)	1910	2189	2569	1318	837	548	162	476	152	512	541	652	—
NITROGEN, mg/L	23.9	61.0	75.5	99.2	53.7	11.2	0.9	0.7	0.8	5.4	1.0	10.5	—
NITROGEN, lb	4184	11,701	13,852	5252	5501	747	37	31	25	281	62	1314	43,578
TDFS, mg/L	461	830	917	793	469	539	427	298	573	540	768	935	—
TDFS, lb	80,794	159,211	168,191	84,451	48,117	35,962	17,458	10,190	18,160	28,573	47,318	58,418	781,452
PASTURE GRASS RECLAMATION AREAS (SUDAN GRASS & OATS, 141.28 AC)													
CROP WATER NEED, IN	7.8	6.6	4.8	3.3	1.5	0.7	0.9	1.7	3.2	4.5	6.5	7.5	
IRRIGATION NEED IN 1-25 YR, IN	7.8	6.6	4.5	2.4	0.0	0.0	0.0	0.0	0.0	2.2	5.9	7.3	
IRRIGATION NEED, MG	29.9	25.3	17.3	9.2	0.0	0.0	0.0	0.0	0.0	8.4	22.6	28.0	140.7
NITROGEN NEED, lb	8400	8400	8300	4000	1700	1700	1700	2000	2800	4100	8400	8400	
EFFLUENT APPLIED:													
• FROM PONDS, MG	14.0	9.0	8.0	9.7	3.0	0.0	4.9	4.1	0.0	0.0	0.0	0.0	82.3
• FROM STORAGE, MG	0.0	0.0	0.0	0.0	0.0	1.1	2.5	3.0	3.6	2.4	9.0	0.0	
EFF N APPLIED:													
• FROM PONDS, lb	2741	4579	5537	3580	1314	747	37	31	0.0	0.0	0.0	0.0	29,919
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	582	1323	1587	1905	1270	4761	0.0	
EFF BOD APPLIED, lb/ac/day (b)	57	118	40	24	5	8	2	4	<0	<0	<0	<0	
TDFS APPLIED:													
• FROM PONDS, lb	55,876	41,300	41,182	28,452	11,734	35,962	17,458	10,190	0.0	0.0	0.0	0.0	451,646
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	6868	16,440	18,732	22,978	14,986	56,196	0.0	
• PER ACRE, lb/ac	381	411	433	459	83	303	234	205	159	106	398	0.0	
• CUMULATIVE, lb/ac	381	822	1255	1709	1792	2095	2329	2534	2693	2799	3197	3197	
GRAPE RECLAMATION AREA (11.15 AC)													
CROP WATER NEED, IN	6.7	5.5	3.5	1.4	0.0	0.0	0.0	0.0	0.0	0.7	3.8	5.8	
IRRIGATION NEED IN 1-25 YR, IN	6.7	5.5	3.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	3.2	5.4	
IRRIGATION NEED, MG	2.4	2.1	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.1	
NITROGEN NEED, lb	300	300	200	100	0.0	0.0	0.0	0.0	0.0	200	300	300	
EFFLUENT APPLIED:													
• FROM PONDS, MG	0.0	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	3.1	1.5	0.0	5.7
• FROM STORAGE, MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EFF N APPLIED:													
• FROM PONDS, lb	0.0	305	189	82	0.0	0.0	0.0	0.0	0.0	140	13	0.0	729
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EFF BOD APPLIED lb/ac/day (b)	0.0	32	15	5	0.0	0.0	0.0	0.0	0.0	19	15	0.0	
TDFS APPLIED:													
• FROM PONDS, lb	0.0	4153	2294	1323	0.0	0.0	0.0	0.0	0.0	13,761	9609	0.0	31,339
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• PER ACRE, lb/ac	0.0	294	163	94	0.0	0.0	0.0	0.0	0.0	989	681	0.0	
• CUMULATIVE, lb/ac	0.0	294	457	551	551	551	551	551	551	1540	2221	2221	
PEACH RECLAMATION AREA (135.16 AC)													
CROP WATER NEED, IN	7.5	6.4	4.1	2.0	0.0	0.0	0.0	0.0	1.7	3.2	5.4	6.7	
IRRIGATION NEED IN 1-25 YR, IN	7.5	6.4	4.1	1.7	0.0	0.0	0.0	0.0	0.0	0.9	4.8	6.5	
IRRIGATION NEED, MG	27.5	23.5	15.0	6.2	0.0	0.0	0.0	0.0	0.0	3.3	17.6	23.9	
NITROGEN NEED, lb	2000	2000	2000	800	0.0	0.0	0.0	0.0	1000	1500	2000	2000	
EFFLUENT APPLIED:													
• FROM PONDS, MG	10.0	3.9	3.1	1.9	0.0	0.0	0.0	0.0	3.8	3.2	5.9	15.0	55.6
• FROM STORAGE, MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.5	3.6	4.3	
EFF. N APPLIED:													
• FROM PONDS, lb	1993	1189	1952	780	0.0	0.0	0.0	0.0	25	191	49	1314	17,995
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	741	1332	1905	687	
EFF BOD APPLIED lb/ac/day (b)	38	22	16	5	0.0	0.0	0.0	0.0	1	2	6	20	
TDFS APPLIED:													
• FROM PONDS, lb	39,107	16,447	23,238	12,566	0.0	0.0	0.0	0.0	10,190	14,812	37,318	58,418	201,495
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8742	15,760	21,078	8187	
• PER ACRE, lb/ac	289	206	172	93	0.0	0.0	0.0	0.0	129	221	436	494	
• CUMULATIVE, lb/ac	289	494	667	759	759	759	759	759	888	1109	1545	2039	2039
STORAGE RESERVOIRS (POND 4 & 5; USEFUL STORAGE VOLUME = 38.9 MG)													
EFFLUENT IN:													
• VOLUME, MG	0.0	9.5	10.6	1.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• NITROGEN, lb	0.0	4883	6675	410	4865	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• TDFS, lb	0.0	45,700	81,011	6614	34,377	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• BOD, lb/day (a)	0.0	7156	7672	377	2715	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EFFLUENT OUT:													
• VOLUME, MG	0.0	0.0	0.0	0.0	0.0	1.1	2.5	3.0	5.0	4.7	12.6	1.3	
• NITROGEN, lb	0.0	0.0	0.0	0.0	0.0	582	1323	1587	2646	1572	6666	687	
• TDFS, lb	0.0	0.0	0.0	0.0	0.0	6638	15,440	18,732	31,220	34,976	78,614	8187	
ACCUMULATION:													
• VOLUME, MG	0.0	9.5	20.1	21.1	30.4	29.3	26.8	23.8	18.8	13.9	1.3	0.0	
• NITROGEN, lb	0.0	4883	11,508	11,918	16,083	15,501	14,178	12,591	9945	7853	687	0.0	
• TDFS, lb	0.0	45,700	126,711	133,325	167,702	194,441	179,139	148,607	117,387	86,791	8187	0.0	

Table A2-3

REVISED RECLAMATION AREA ACREAGES AND CROPS (a)

BLOCK#	EFFECTIVE IRRIGABLE ACREAGE (b)	CROP (s)
09	12	WINTER OATS/SUMMER SUDAN GRASS
09	1.72	PEACHES
041	36.39	PEACHES
092, 044, 045	78.66	WINTER OATS/SUMMER SUDAN GRASS
042	17.29	PEACHES
043	22.54	PEACHES
046	21.25	PEACHES
047	10.9	PEACHES
048	11.6	PEACHES
049	13.47	PEACHES
050	14.11	GRAPES
091	13.52	WINTER OATS/SUMMER SUDAN GRASS
093	37.1	WINTER OATS/SUMMER SUDAN GRASS
TOTALS BY CROP	14.11	GRAPES
	141.28	WINTER OATS/SUMMER SUDAN GRASS
	135.16	PEACHES

(a) AS OF JANUARY, 1996. SOURCE: J.R. WOOD.

(b) ACTUAL ACREAGE GROWING CROPS AND UNDER IRRIGATION.

Table A2-4

RECLAMATION SYSTEM NITROGEN NEEDS

CROP	J.R. WOOD CROP ACREAGE	NITROGEN USE ESTIMATE (a)	NITROGEN NEED (a)
SUMMER SUDAN	141.28 ac	325 lb/ac/yr	45,916 lb/yr
WINTER OATS (b)	141.28 ac	80 lb/ac/yr	11,302 lb/yr
GRAPES	14.11 ac	125 lb/ac/yr	1,764 lb/yr
PEACHES	135.16 ac	95 lb/ac/yr	12,840 lb/yr
ESTIMATED CROP NITROGEN NEED			71, 822 lb/yr

(a) SOURCE: WESTERN FERTILIZER HANDBOOK. NITROGEN NEEDS OF THE HARVESTED PORTION OF THE CROP, I.E., THESE FIGURES DO NOT INCLUDE THE NITROGEN UPTAKE OF THE WOODY, NON-HARVESTED GROWTH OF PEACH TREES AND GRAPE VINES.

(b) WINTER OATS ARE ESTIMATED TO NEED ONLY 70% OF THE NITROTEN OF A CONVENTIONAL OAT CROP.

Table A2-5

PROJECTED J.R. WOOD RECLAMATION SYSTEM TREATMENT PERFORMANCE

Parameter	Value by Month												
	J	A	S	O	N	D	J	F	M	A	M	J	TOTAL
Flow, MG	24	23	22	12.8	12.3	8.0	4.9	4.1	3.8	6.3	7.4	15	143.6
BOD_{in}, mg/L	2,700	4,000	3,700	2,000	1,500	1,200	500	1,800	800	900	1,500	1,100	—
Digester:													
k_d, Day^{-1}	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	—
BOD_{out}, MG/l	2,338	3,443	3,180	1,906	1,160	819	284	989	404	573	998	887	—
Ponds:													
k_p, day^{-1}	0.040	0.040	0.040	0.040	0.035	0.030	0.024	0.030	0.035	0.035	0.040	0.040	—
BOD_{out}, mg/L	1,910	2,789	2,569	1,318	837	528	162	476	152	312	541	652	—

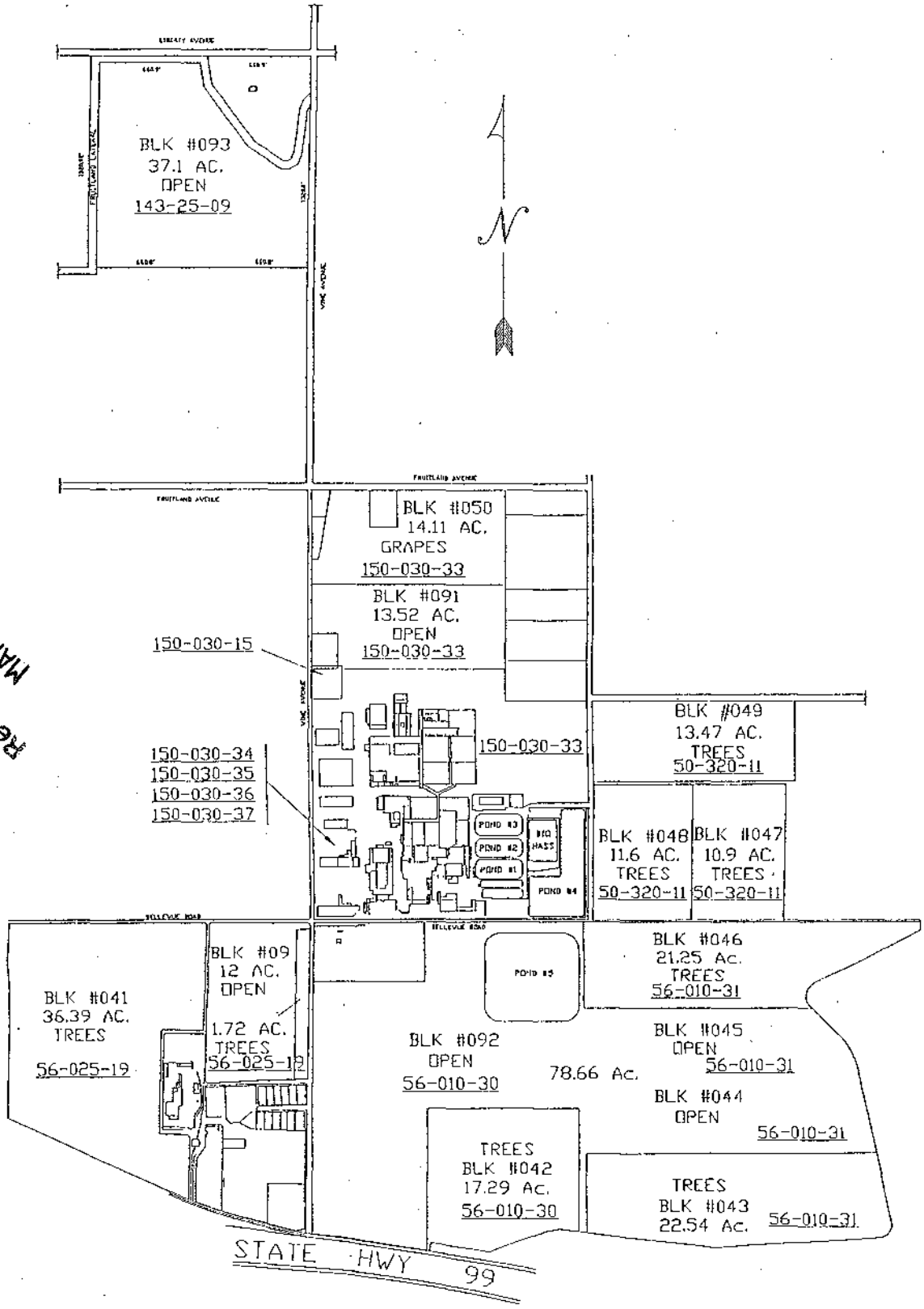


Figure A2-1
RECLAMATION AREA PARCELS AND ACREAGE

Appendix A2-1
Salt Data

ECO:LOGIC

PROJECT J. R. WOOD	JOB NO.	BY RES	DATE 3/19/96
SUBJECT SALT UPTAKE BY CROPS		CHECKED NO	PG 1 OF 2

AT THE REQUEST OF LARRY LOWE (REGIONAL BOARD, FRESNO OFFICE), I CONTACTED UCD TO GET THE INPUT OF UCD RESEARCHERS ON THE SUBJECT OF SALT UPTAKE BY CROPS. THE FOLLOWING INFORMATION IS THE RESULT OF THOSE CONTACTS:

CROP	SALT (MINERAL ASH) CONTENT	REFERENCE
PEACHES	5.3% OF DRY WEIGHT (PEACHES ARE 85-87% H_2O)	TED d'JUNG 752-0122 (POMOLOGY)
SUDAN GRASS, WINTER OATS	NO SPECIFIC VALUE FOR THESE SPECIFIC GRASSES, INFORMATION FOR BARLEY IS AVAILABLE AND IS THOUGHT TO BE REPRESENTATIVE: 300 lb SALT / TON DRY (GRASS IS ~90% H_2O)	BILL RAINS 752-1711 (AGRONOMY & RANGE SCIENCE)
GRAPES	20.4 lb / TON WET (SEE BELOW)	LARRY WILLIAMS 209-891-2500 KEARNEY AG. CENTER

GRAPES:

MINERAL NUTRIENT	NUTRIENT HARVESTED	SALT FORM OF NUTRIENT	SALT HARVESTED
N	1.46 kg/tonne	NO_3^-	6.47 kg/tonne
P	0.28 kg/tonne	PO_4^-	0.86 kg/tonne
K	2.47 kg/tonne	K^+	2.47 kg/tonne
Ca	0.50 kg/tonne	Ca^{++}	0.50 kg/tonne
Mg	0.10 kg/tonne	Mg^{++}	0.10 kg/tonne
NON-NUTRIENT MINERALS	NOT REPORTED	NON-NUTRIENT SALTS	NOT REPORTED

TOTAL SALT REMOVED BY HARVEST > 10.40 kg/tonne (WET)

$$\frac{10.40\ kg}{1000\ kg} = \frac{10.40\ lb}{1000\ lb} = \frac{20.8\ lb}{TON}$$

OF WHICH "N" IS:

$$\frac{1.46}{10.40}\left(20.8\ \frac{lb}{T}\right) = 2.92\ lb/TON$$

ECO:LOGIC

PROJECT	JOB NO.	BY	DATE 3/19/96
SUBJECT		CHECKED	PG 2 OF 2

CROP	J.R. WOOD REPORTED CROP YIELD	SALT UPTAKE THAT IS HARVESTED WITH CROP	% H_2O	TYPICAL CROP YIELD ON A DRY WT. BASIS	TYPICAL AMOUNT OF SALT HARVESTED
PEACHES	25-30 WET TON / AC·YR	5.3% OF DRY WT.	~86%	3.85 DRY TON / AC·YR	408 lb / AC·YR
GRAPES	11-12 WET TON / AC·YR	≥20.8 lb / WET TON	NA	NA	≥239 lb / AC·YR
SUDAN GRASS	30-32 WET TON / AC·YR	300 lb / DRY TON	~90%	4.20 DRY TON / AC·YR	1260 lb / AC·YR
WINTER OATS	10-12 WET TON / AC·YR				

ALLOWABLE SALT APPLICATION TO THE PARCELS AND TO THE RECLAMATION AREA AS A WHOLE UNDER THE "DAIRY GUIDELINES"

CROP	CROP ACREAGE	SALT HARVESTED PER ACRE	ALLOWABLE SALT APPLICATION PER ACRE*	ALLOWABLE SALT APPLICATION OF W/W ORIGINS
PEACHES	135.16 ac	408 lb/ac·yr	2408 lb/ac·yr	325,465 lb/yr
GRAPES	14.11 ac	≥239 lb/ac·yr	2239 lb/ac·yr	≥31,592 lb/yr
SUDAN GRASS & WINTER OATS	141.28 ac	1260 lb/ac·yr	3260 lb/ac·yr	460,573 lb/yr
TOTAL ALLOWABLE SALT APPLICATION				817,574 lb/yr

* BASED ON DIARY GUIDELINE THAT UP TO 2000 lb/ac·yr CAN BE APPLIED PER YEAR IN EXCESS OF CROP DEMANDS WITHOUT THREATENING GROUNDWATER QUALITY.

SUMMARY:

BASED ON CROP-SPECIFIC INPUT FROM UCD STAFF AND THE "DAIRY GUIDELINE", THE J.R. WOOD RECLAMATION AREA COULD RECEIVE ~818,000 lb/yr OF TDFS. THE J.R. WOOD FOOD PROCESSING WATER CONTAINS ABOUT 764,000 lb/yr OF TDFS; THUS, THERE SHOULD BE NO SIGNIFICANT TDFS PROBLEMS ASSOCIATED WITH THE PROPOSED RECLAMATION PROJECT.

THE UCD DATA INDICATE THAT THE SALT UPTAKE ESTIMATES FOR GRAPES WERE HIGH, PEACHES WERE LOW, AND FODDER CROPS WERE LOW. THE NET EFFECT IS 1) THE RECLAMATION AREA CAN RECEIVE MORE SALT THAN ORIGINALLY ESTIMATED, AND 2) SOME WATER CURRENTLY SHOWN GOING TO THE GRAPES SHOULD BE TRANSFERRED TO THE FODDER CROPS AND/OR PEACHES. THIS WILL BE DONE

Appendix A2-2
Digester Performance Analysis

ECO:LOGIC

PROJECT J.R. WOOD	JOB NO.	BY RES	DATE / /
SUBJECT ANAEROBIC DIGESTER / FILTER		CHECKED	PG 1 OF 3

- MODEL RESULTS OF ANAEROBIC DIGESTER / FILTER SO AS TO PREDICT FUTURE PERFORMANCE.

- 1ST ORDER KINETIC MODEL WITH EMPIRICALLY DERIVED K SHOULD BE ADEQUATE. FIRST, VERIFY THAT ANAEROBIC PROCESSES ARE CONSIDERED TO BE SIMILAR TO AEROBIC PROCESSES KNOWN TO FOLLOW SIMPLE 1ST ORDER KINETIC MODELS:

$$\theta = \frac{1}{\frac{Yk S^{eff}}{K_c + S^{eff}} - b}$$

DIGESTER
WEF MOP #8 p. 1274

$$\theta = \frac{1}{\frac{\mu_m S}{K_s + S} - k_d}$$

ACT SLUDGE
M&E p. 375

DETAILED ANALYTICAL EQUATIONS SIMILAR THEREFORE SIMPLE FIRST-ORDER KINETIC MODEL IS A VALID EMPIRICAL MODEL FOR EXTRAPOLATING RESULTS FROM A FIXED FILM PROCESS.

- FIRST-ORDER KINETIC MODEL

$$\frac{BOD_{OUT}}{BOD_{IN}} = \frac{1}{1 + k\theta_H}$$

θ_H — HYDRAULIC RESIDENCE TIME OF REACTOR, DAYS

k — KINETIC DECAY RATE, DAY^{-1}

SEE PAGE 2 & 3, FROM THESE PAGES A REASONABLE, CONSERVATIVE MODEL FOR THE DIGESTER IS:

$$\frac{BOD_{OUT}}{BOD_{IN}} \lesssim \frac{1}{1 + 0.06\,\theta_H}$$

DETERMINATION OF APPARENT "K" TERMS FOR 2 YEARS OF DATA

MONTH	BOD_{IN_D}	BOD_{OUT_D} / BOD_{IN_P}	BOD_{OUT_P}	Q MG.	DIGESTER(a) Θ_H	DIGESTER(a) k_D	DIGESTER(a) REMOVAL lb/day	3-POND SERIES REMOVAL lb/day	3-POND SERIES k_P
JAN 93	357	45	73	0.8	77.5	0.0895	67.2		
FEB	785	437*	110	3.2	17.5	0.0455	332		0.049
MAR	741	474*	132	2.5	24.8	0.0227	180		0.032
APR	1605	179	47	2.6	23.1	0.3449	1031		0.036
MAY	1698	800	115	5.0	12.4	0.0905	1208		0.1086
JUNE	4109	912	310	2.6	23.1	0.1518	2311	435	0.028
JULY	3539	920	223	6.1	10.2	0.2791	4298	1,144	0.0879
AUG	4661	3420	326	10.6	5.85	0.0620	3539	8,823	0.301
SEPT	5019	3942	1147	5.5	10.9	0.0251	1647	4,279	0.0691
OCT	3990	1884*	568	3.6	17.2	0.0650*	2040	1,275	0.0422
NOV	4536	1473	238	2.4	25.0	0.0832	2044		0.0495
DEC '93	2602	380	41	2.1	29.5	0.1982	1255		0.0551
JAN '94	508	108	15	2.9	21.4	0.1731	312		0.117
FEB	2761	330	167	2.1	26.7	0.2759	1520		0.0141
MAR	106	56	30	1.8	34.4	0.0260	24		—
APR	560	415*	35	3.8	15.8	0.0221	153		0.120
MAY	760	520*	15	4.4	14.1	0.0327	284		0.237
JUNE	757	620	228	9.3	6.45	0.0343	354	1013	0.091
JULY	2646	513	240	9.2	6.74	0.4685	5279	676	0,0633
AUG	3373	1578	323	10.0	6.20	0.1835	4829	3,376	0.166
SEPT	3824	2930*	1238	10.0	6.00	0.0509*	2485	4,704	0.082
OCT	2829	1059	473	6.3	9.84	0.1699	3000	993	0.046
NOV	2071	1173*	228	6.3	9.52	0.0804*	1573		0.113
DEC '94	855	275	8	4.0	15.5	0.1361	624		—

(a) LIQUID VOLUME IS ESTIMATED TO BE ~3 MG W/O ANY SLUDGE. THE CURRENT EFFECTIVE VOLUME IS PROBABLY ≤2MG BECAUSE OF SLUDGE. BECAUSE K WILL BE EXTRAPOLATED, AN ERROR IN ESTIMATING EFFECTIVE VOLUME SHOULD NOT BE SIGNIFICANT AS LONG AS NO SUBSEQUENT CLAIM IS MADE TO THE EFFECT THAT SUBSTANTIAL TREATMENT CAPACITY CAN BE GAINED BY CLEANING THE DIGESTER.

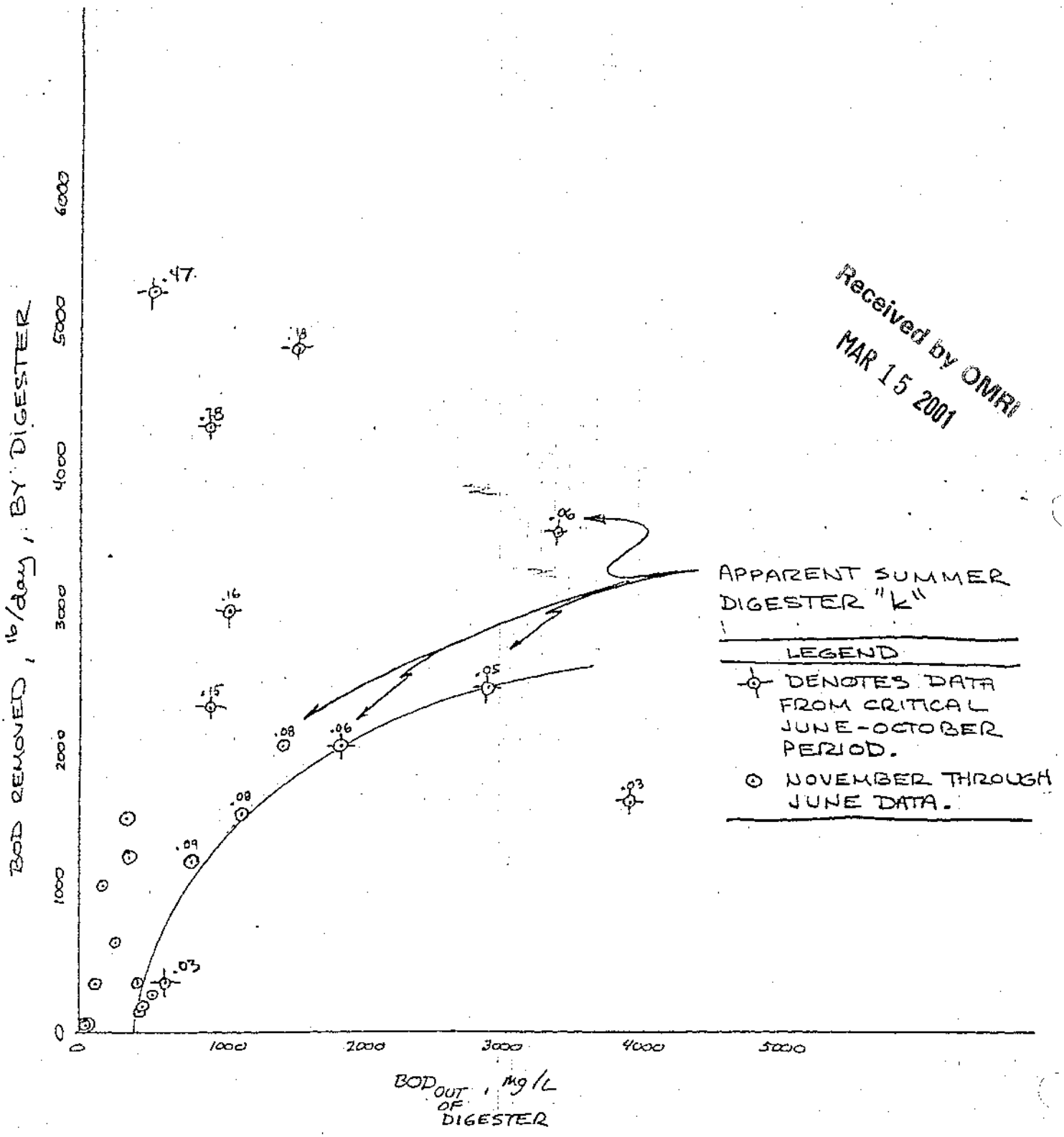
$\Theta_H \sim (2\,MG) / (Q \div \#\,DAY\ IN\ MONTH)$

$$K_D \sim \frac{\frac{BOD_{IN}}{BOD_{OUT}} - 1}{\Theta_H}$$

$$REMOVAL, lb/day = \frac{(BOD_{IN} - BOD_{OUT})(MG)(8.34)}{\#\,DAY\ IN\ MONTH}$$

ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
SUBJECT		CHECKED	PG 3 OF 3



Appendix A2-3
Treatment Pond Performance Analysis

ECO:LOGIC

PROJECT J.R. WOOD	JOB NO.	BY	DATE / /
SUBJECT AERATED POND SYSTEM		CHECKED	PG 1 OF 3

- MODEL PERFORMANCE OF EXISTING SYSTEM TO PREDICT FUTURE PERFORMANCE.

ACCEPTED MODEL FORM FOR AERATED PONDS:

$$\frac{BOD_{OUT}}{BOD_{IN}} = \frac{1}{1+k\Theta_H}$$

POND VOLUMES ARE REPORTED TO BE APPROXIMATELY
POND 1 ~ 1.6 MG
POND 2 ~ 1.1 MG
POND 3 ~ 1.35 MG

THE AVERAGE POND VOLUME IS 1.35 MG. IN SANGER ANALYSIS OF ATWATER DATA IT WAS SHOWN THAT USING THE AVERAGE VOLUME TO SIMPLIFY ANALYSIS DID NOT RESULT IN ANY SIGNIFICANT ERRORS WITHIN THE CONTEXT OF "ERROR" INTRODUCED FROM UNCONTROLLABLE VARIABLES RELATED TO SAMPLING, W/W CHARACTERISTICS, AND CLIMATIC FACTORS. (SEE 11/11/93 SANGER CALC P. 1/11 IN "DESIGN REPORTS")

MODEL BASED ON 3 - 1.35 MG PONDS:

$$\frac{BOD_{OUT\,POND\,3}}{BOD_{IN\,POND\,1}} = \left(\frac{1}{1+k\,\frac{1.35\,MG}{Q,\,MGD}}\right)^3$$

WORKING FORM FOR ANALYSIS OF 1993/94 DATA

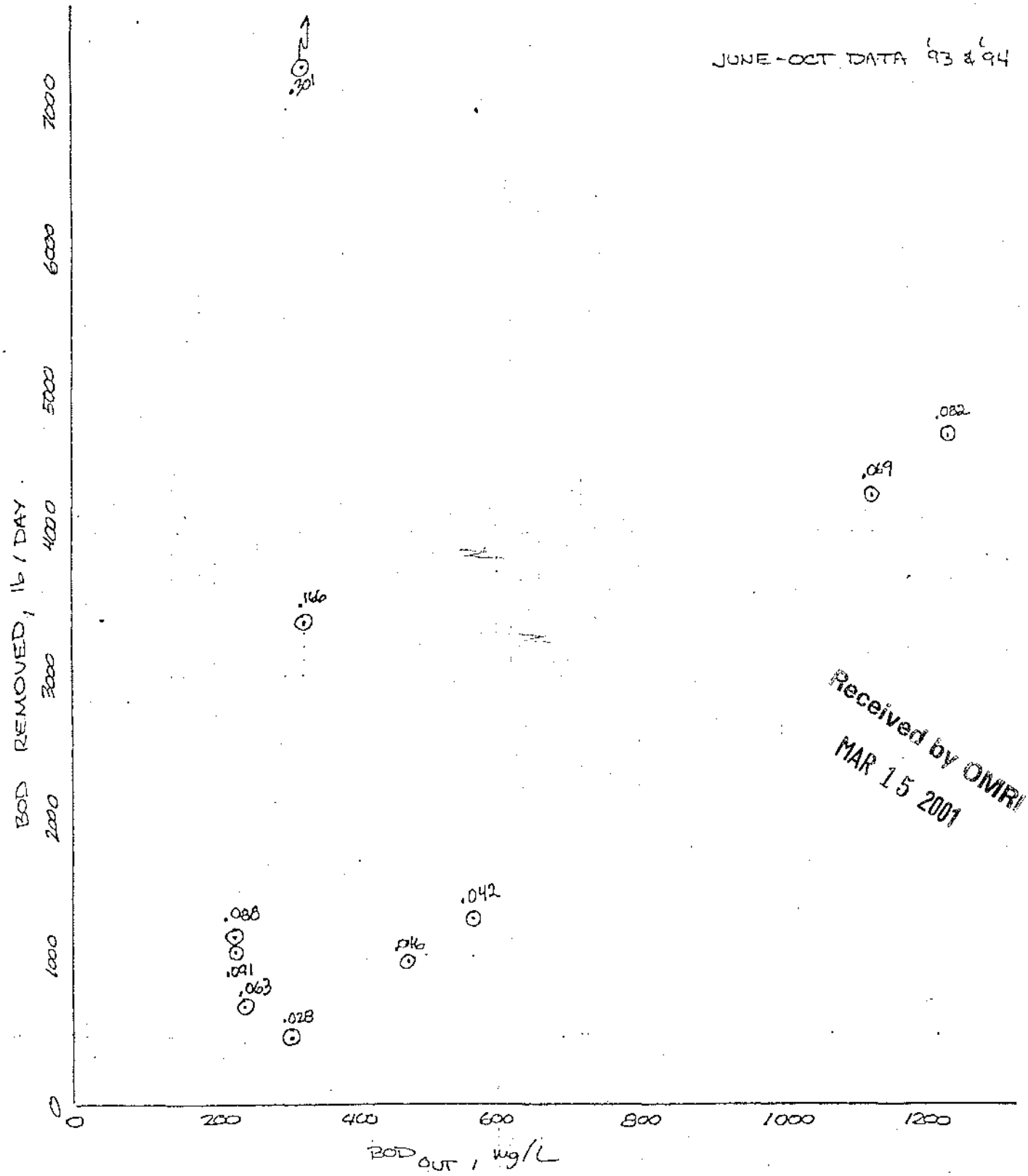
$$k = \frac{Q}{1.35}\left(\left[\frac{BOD_{IN}}{BOD_{OUT_3}}\right]^{.333} - 1\right)$$

FROM ANALYSIS, IT APPEARS THAT K UNDER CRITICAL SUMMER/LATE SUMMER CONDITIONS WILL HAVE A VALUE IN EXCESS OF 0.04/DAY AT SUMMER WATER TEMPS.

$$\frac{BOD_{OUT\,POND\,3}}{BOD_{IN\,POND\,1}} = \left[\frac{1}{1+.04\left(\frac{1.35\,MG}{Q}\right)}\right]^3$$

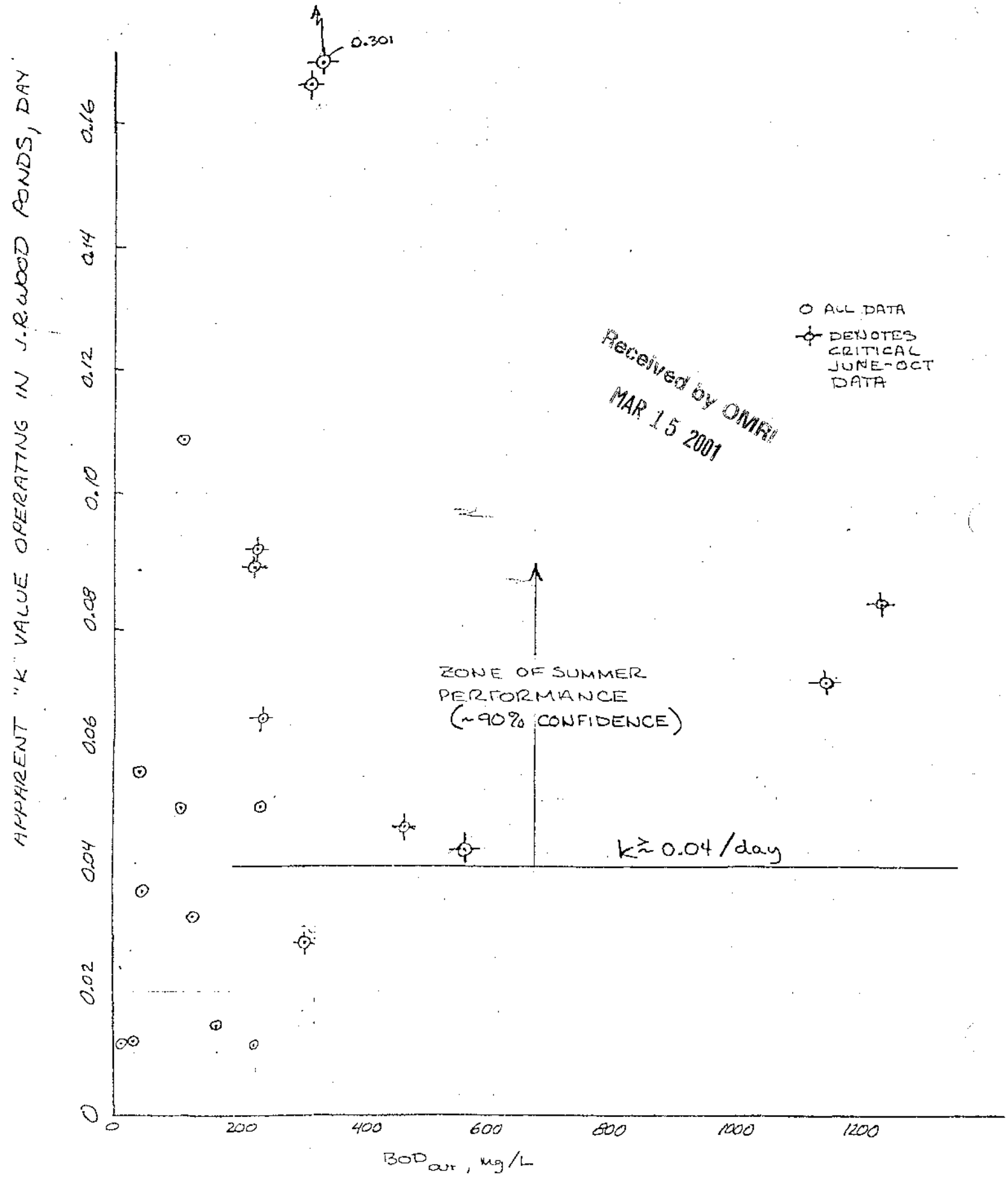
ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
SUBJECT		CHECKED	PG 2 OF 3



ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
SUBJECT		CHECKED	PG 3 OF 3



Appendix A2-4
General Data

Table 4-1

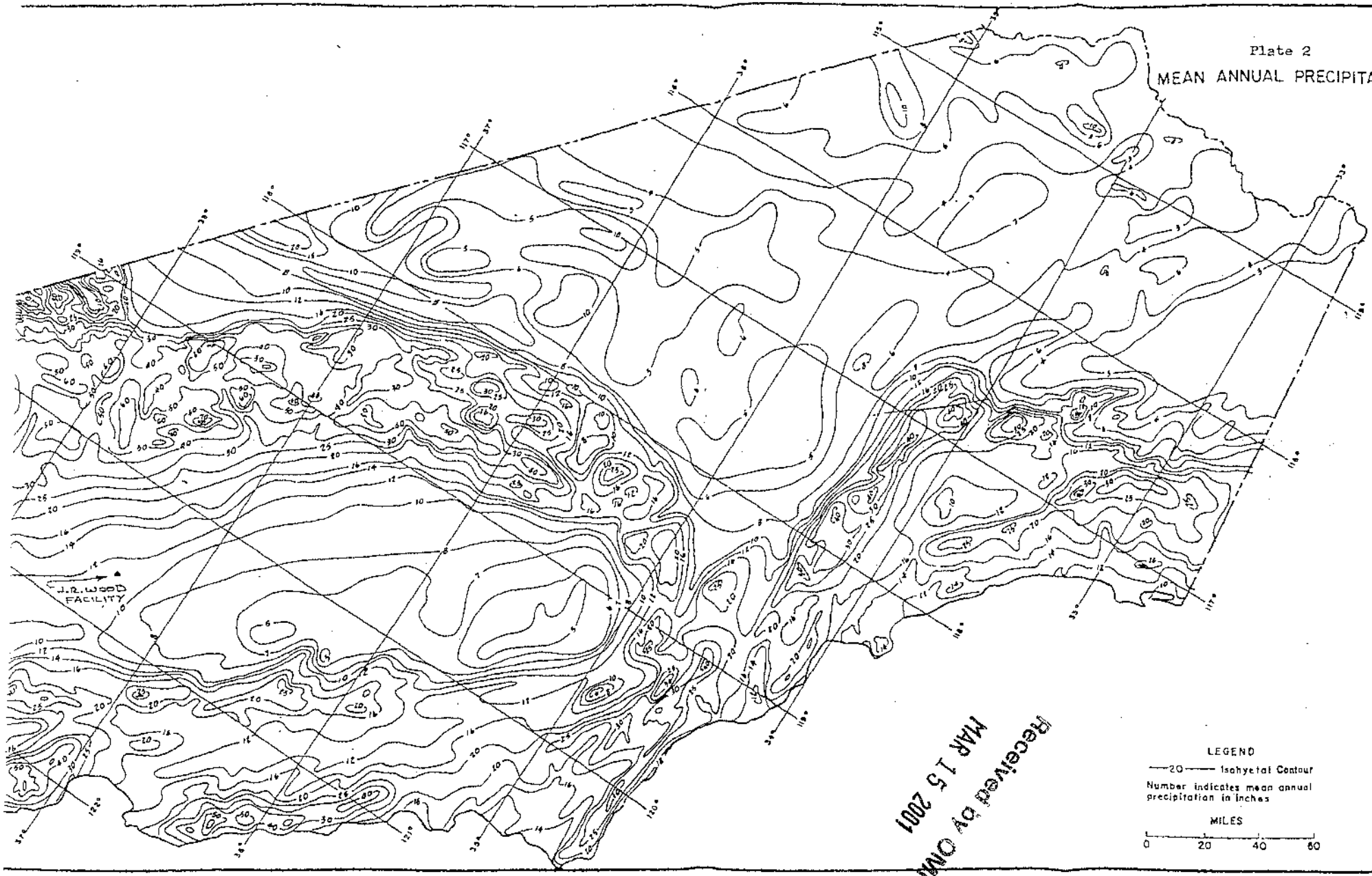
Plant Food Utilization by Various Crops[1]

Crop	Yield	Pounds per Acre N	P_2O_5	K_2O
Field crops				
Barley	2½ t. (104 bu.)	160	60	160
Corn (grain)	5 t. (179 bu.)	240	100	240
Corn (silage)	30 t.	250	105	250
Cotton (lint)	1,500 lbs.	180	65	125
Grain sorghum	4 t. (143 bu.)	250	90	200
Oats	3,200 lbs. (100 bu.)	115	40	145
Rice	7,000 lbs.	110	60	150
Safflower	4,000 lbs.	200	50	150
Soybeans	3,600 lbs. (60 bu.)	325	65	145
Sugar beets	30 t.	255	60	550
Wheat	3 t. (100 bu.)	175	70	200
Vegetable crops				
Asparagus	3,000 lbs.	95	50	120
Beans (snap)	10,000 lbs.	175	40	200
Broccoli	18,000 lbs.	80	30	75
Cabbage	35 t.	270	65	250
Celery	75 t.	280	165	750
Lettuce	20 t.	95	30	200
Potatoes (Irish)	500 cwt.	270	100	550
Squash	10 t.	85	20	120
Sweet potatoes	15 t.	155	70	315
Tomatoes	30 t.	180	50	340
Fruit and nut crops				
Almonds (in shell)	3,000 lbs.	200	75	250
Apples	15 t.	120	55	215
Cantaloupes	30 t.	220	70	400
Grapes	15 t.	125	45	195
Oranges	30 t.	265	55	330
Peaches	15 t.	95	40	120
Pears	15 t.	85	25	95
Prunes	15 t.	90	30	130
Forage crops				
Alfalfa	8 t.	480	95	480
Bromegrass	5 t.	220	65	315
Clovergrass	6 t.	300	90	360
Orchardgrass	6 t.	300	100	375
Sorghum-sudan	8 t.	325	125	475
Timothy	4 t.	150	55	250
Vetch	7 t.	390	105	320
Turf crops				
Bentgrass	2½ t.	260	65	145
Bermudagrass	4 t.	225	40	160

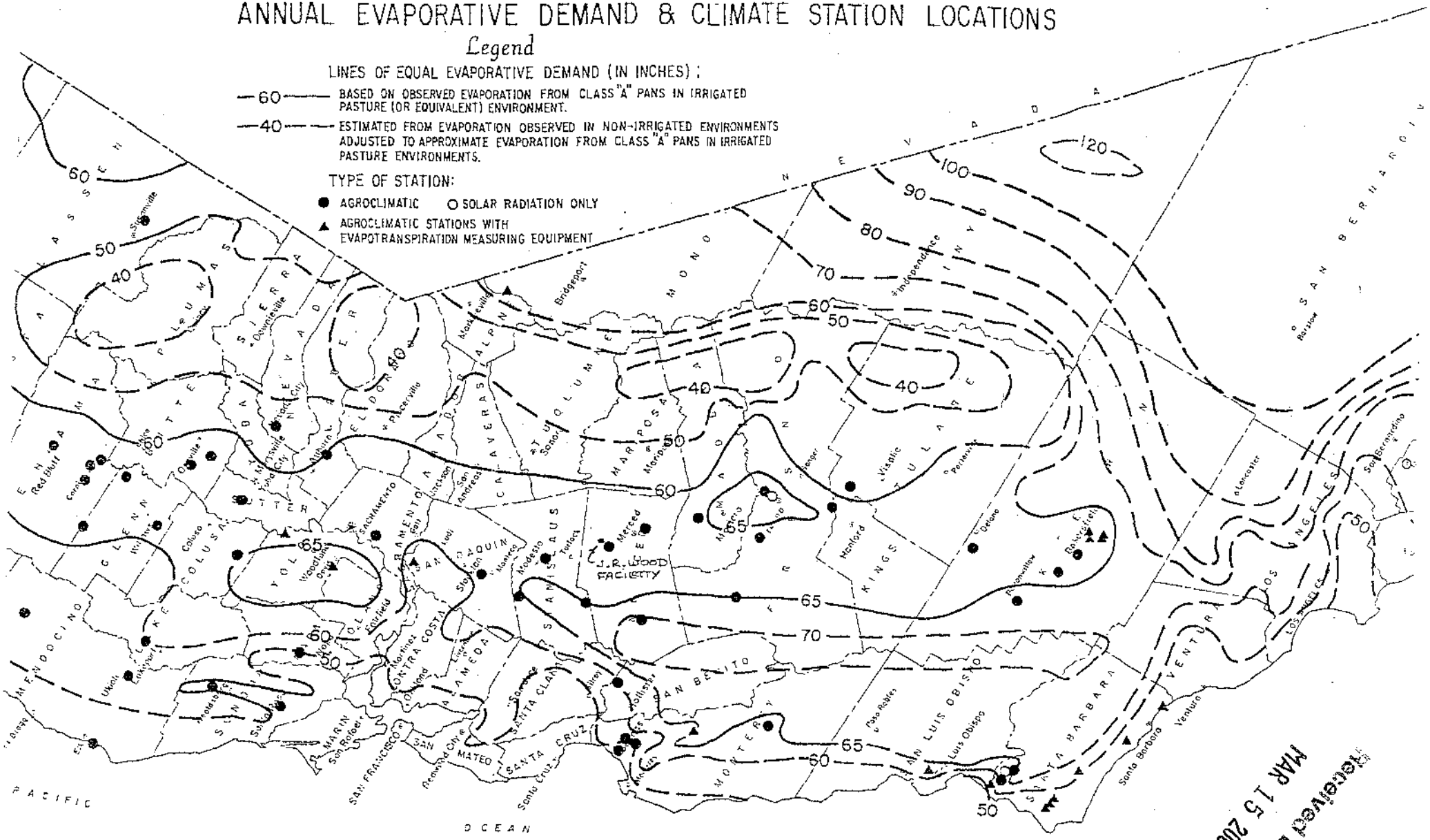
[1]Total uptake in harvested portion

Plate 2

MEAN ANNUAL PRECIPITATION



ANNUAL EVAPORATIVE DEMAND & CLIMATE STATION LOCATIONS



ECO:LOGIC

PROJECT J.R. WOOD	JOB NO.	BY	DATE 1 1
SUBJECT ESTIMATES OF EXISTING TREATMENT		CHECKED	PG 1 OF 3

ISSUE: IF EXISTING J.R. WOOD WASTEWATER TREATMENT SYSTEM REMAINS IN SERVICE (WITH ADDITIONAL AERATION AS NECESSARY), WHAT APPROXIMATE LEVEL OF AERATION WOULD BE NEEDED IN THE 35.8 MG AERATED STORAGE PONDS (4 & 5).

APPROXIMATION:

- USE ~90% CONFIDENCE LEVEL PERFORMANCE OF DIGESTER (I.E., DIGESTER PERFORMANCE IS POORER THAN EXPECTED ABOUT 1/10% OF THE TIME:

$$\frac{BOD_{OUT}}{BOD_{IN}} \leq \frac{1}{1+0.06\frac{\theta_H}{DAY}}$$

BASED ON EFFECTIVE DIGESTER VOLUME OF ~ 2MG

CRITICAL MONTH IS SEPTEMBER: Q ~ 21 MG/M = 0.7 MGD
BOD ~ 3700 mg/L

$$\frac{BOD_{OUT}}{3700\ mg/L} = \frac{1}{1+\frac{0.06}{DAY}\left(\frac{2\ MG}{0.7\ MGD}\right)}$$

$$BOD_{OUT} = 3159\ mg/L$$

Received by OMR
MAR 15 2001

- USE ~90% CONFIDENCE LEVEL PERFORMANCE OF 3 AERATED PONDS IN SERIES:

$$\frac{BOD_{OUT}}{BOD_{IN}} = \left[\frac{1}{1+\frac{.04}{DAY}\left(\frac{1.35\ MG}{0.7\ MGD}\right)}\right]^3$$

$BOD_{IN} \leq 3159\ mg/L$

$BOD_{OUT} \sim 2528\ mg/L$

- VOLUME OF WATER TO STORAGE $\approx \frac{14.3\ MG - 5.1\ MG}{30\ DAYS} \sim \frac{9.2\ MG}{30\ DAYS} \sim 0.31$ MGD ON 30 DAY BASIS!

30 DAY MAX 2 WEEK PERIOD IS ~ 0.5 MGD

- THE BOD REDUCTION CHARACTERISTICS OF THE AERATED STORAGE POND SHOULD BE SIMILAR TO THOSE OF THE AERATED TREATMENT POND EXCEPT THAT THE ~90% CONFIDENCE LEVEL IS BASED ON HOW HIGH THE TREATMENT RATE MAY GET TO TRY TO BE SURE THERE IS ENOUGH AERATION POTENTIAL, IF NEEDED.

FROM PAST DATA IT APPEARS THAT K COULD BE AS HIGH AS ~ 0.09/DAY.

POND 4: EFFECTIVE VOLUME = 10.3 MG. FROM WATER BALANCE, SEPT 1 STARTS WITH 5.1 MG IN STORAGE AND ENDS WITH 14.3 MG (WHICH IS > 10.3 MG VOLUME OF POND 4; THUS, A FLOW THROUGH CONDITION EXISTS). ~ 4 MONTHS

BASED ON FLOW THROUGH CONDITIONS & MODEL OF EXISTING AERATED POND PERFORMANCE:

POND 4: (POND 4 MAY BE LEAD STORAGE POND)

$$\frac{BOD_{out_4}}{2528\ mg/L} = \frac{1}{1+.09\left(\frac{\sim 12\ MG}{0.5\ MGD}\right)} \Rightarrow BOD_{out_4} \sim 800\ mg/L$$

(~ TOTAL LIQUID VOL EST.; ← MAX SUSTAINED TO STORAGE)

BOD REDUCTION ≈ $(2528 - 809\ \frac{mg}{L})(0.5\ MGD)(8.34) \sim 7206\ lb/d$

$$HP_{NEED} \approx \frac{7206\ lb/d}{1.2\ lb/hr \times 24\ hr/d} \sim 250\ HP \text{ BASED ON } BOD_5$$

(MINIMUM MIX OF DIRECTIONAL & CONVENTIONAL)

* LOW END HP: $\frac{BOD}{2528} = \frac{1}{1+.04\left(\frac{12}{.5}\right)} \Rightarrow 1290.$ ‖ $\frac{(2528-1290)(.5)(8.34)}{1.2 \times 24}$

180 HP for BOD_5

WHAT IF THE KINETICS ARE ACTUALLY 0^{th}-ORDER, I.E., BOD SATURATED FROM A MICROBIOLOGICAL KINETIC PERSPECTIVE:

- EMPIRICAL 1ST-ORDER MODEL FIT IMPLIED k WAS IN 0.04 TO 0.09/d RANGE (WHICH IS REASONABLE CONSIDERING BIOMASS & NUTRIENT POSSIBLE LIMITATIONS

BOD_{OUT} ESTIMATES: K=0.04 2528 mg/L (FROM PAGE 1/3)

K=0.09 $\frac{BOD_{OUT}}{3159} = \left[\frac{1}{1+.09\left(\frac{1.35}{.7}\right)}\right]^3 \Rightarrow BOD_{OUT} = 1954$

ΔBOD @ 0^{th} ORDER: $\frac{3159-2528}{3\left(\frac{1.35}{.7}\right)} = \frac{631\ mg/L}{5.79\ DAYS}\ (.8621) = \frac{109\ mg/L}{DAY}$

$$\frac{3159-1954}{3\left(\frac{1.35}{.7}\right)} = \frac{208\ mg/L}{DAY}$$

SO POND 4 AS A HYDRAULIC RESIDENCE TIME OF ≈ $\frac{12\ MG}{0.5\ MGD} \approx 24$ DAYS

0^{th} REDUCTION ESTIMATES:

$(24\ DAYS)(109\ mg/L/day) = 2616\ mg/L$

$(24\ DAYS)(208\ mg/L/day) = 4992\ mg/L$

→ MORE THAN PRESENT ∞ ≈ ALL WOULD BE GONE (BUT 1ST ORDER WOULD OCCUR & LIMIT TO SOME EXTENT!)

$(2528\ mg/L - 50\ mg/L)(0.5\ MGD)(8.34)/1.2 \times 24 \approx 360\ HP$ for BOD_5

(50 mg/L: GUESS AT LEFTOVER FROM 1ST ORDER)

IF BOD_5 IS ~67% OF BOD_{TOT} THEN CONVERTING TO BOD_L REQUIRES A 1.5 MULTIPLIER.

POND 4 SUMMARY: COULD NEED UP TO 540 HP IN WORST CASE, I.E., POND 4 IN LEAD USE & LOW POND KINETICS & HIGH STORAGE KINETICS. PLAN FOR ~540 HP WITH MINIMUM INSTALLATION BEING

ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
SUBJECT		CHECKED	PG 3 OF 3

POND 5:

OPTION #1: POND 5 CAN FUNCTION AS LEAD POND. IN THIS CASE IT COULD HOLD HIGH STRENGTH SEPT. WASTE UNTIL ITS BOD IS ~ DEPLETED AT HIGH Oth RATE:

$$\frac{2528\ mg/L}{\frac{208\ mg/L}{DAY}} = 12 \text{ DAYS TO DEPLETE}$$

< SEPT STORAGE IS GREATER THAN 12 DAYS IN PONDS

AERATOR NEED: ≤ 540 HP JUST LIKE POND 4.

OPTION #2: POND 5 COULD ~~ONLY~~ RECEIVE WATER FROM POND 4. [NOTE: POND 4 COULD BE USED TO PROVIDE THE THREE FEET OF OPERATIONAL WATER NEEDED FOR THE AERATORS; THUS, INCREASING THE TOTAL EFFECTIVE STORAGE VOLUME OF THE SYSTEM BY 3.1 MILLION GALLONS]. THE MAXIMUM ESTIMATED BOD_5 LOAD WOULD THEN BE:

- 2528 mg/L OUT OF POND 3.
- POND 4 AT LOW KINETIC RATE (1ST ORDER) FOR 0.5 MGD FLOW TO STORAGE.

$$\frac{BOD_{OUT}}{2528} = \frac{1}{1+(.04)\left(\frac{12}{.5}\right)} = 1290\ mg/L$$

- POND 5:

$$(1290\ mg/L)(0.5\ MGD)(8.34) = 5380\ lb/day$$

$$\frac{5380\ lb/day}{(1.2)(24)}(1.5) \sim 280\ HP$$

POND 5 SUMMARY: IF POND 5 CAN TAKE EFFLUENT DIRECTLY THEN IT NEEDS UP TO ~ 540HP. IF POND 5 TAKES EFFLUENT ONLY FROM POND 4 AT THE CRITICAL TIME OF YEAR, THEN ITS HP NEED (WORST CASE) IS PROBABLY ABOUT 280HP (MINIMUM INITIAL INSTALLATION PROBABLY ABOUT ≈ 100 HP.

BASED ON FLOW THROUGH CONDITIONS & MODEL OF EXISTING AERATED POND PERFORMANCE:

POND 4: (POND 4 MAY BE LEAD STORAGE POND)

$$\frac{BOD_{OUT_4}}{2528\ mg/L} = \frac{1}{1+.09\left(\frac{\sim 12\ MG}{0.5\ MGD}\right)} \Rightarrow BOD_{OUT_4} \sim 800\ mg/L$$

(~ TOTAL LIQUID VOL EST.; MAX SUSTAINED TO STORAGE)

BOD REDUCTION $\approx (2528 - 800\ \frac{mg}{L})(0.5\ MGD)(8.34) \sim 7206\ lb/d$

$$HP_{NEED} \approx \frac{7206\ lb/d}{1.2\ lb/hr \times 24\ hr/d} \sim \underline{250\ HP\ BASED\ ON\ BOD_5}$$

MINIMUM (MIX OF DIRECTIONAL & CONVENTIONAL)

* LOW END HP:

$$\frac{BOD}{2528} = \frac{1}{1+.04\left(\frac{12}{.5}\right)} \Rightarrow 1290.$$

$$\frac{(2528-1290)(.5)(8.34)}{1.2 \times 24} \quad 180\ HP\ for\ BOD_5$$

WHAT IF THE KINETICS ARE ACTUALLY 0^{th}-ORDER, I.E., BOD SATURATED FROM A MICROBIOLOGICAL KINETIC PERSPECTIVE:

- EMPIRICAL 1^{st}-ORDER MODEL FIT IMPLIED k WAS IN 0.04 TO 0.09/d RANGE (WHICH IS REASONABLE CONSIDERING BIOMASS & NUTRIENT POSSIBLE LIMITATIONS

BOD_{OUT} ESTIMATES: $k = 0.04$ $2528\ mg/L$ (FROM PAGE 1/3)

$k = 0.09$ $\frac{BOD_{OUT}}{3159} = \left[\frac{1}{1+.09\left(\frac{1.35}{.7}\right)}\right]^3 \Rightarrow BOD_{OUT} = 1954$

ΔBOD @ 0^{th}-ORDER: $\frac{3159-2528}{3\left(\frac{1.35}{.7}\right)} = \frac{631\ mg/L}{5.79\ DAYS} = \frac{109\ mg/L}{DAY}$ (.8521)

$$\frac{3159-1954}{3\left(\frac{1.35}{.7}\right)} = \frac{208\ mg/L}{DAY}$$

SO POND 4 AS A HYDRAULIC RESIDENCE TIME OF $\approx \frac{12\ MG}{0.5\ MGD} \approx 24$ DAYS

0^{th} REDUCTION ESTIMATES:

$(24\ DAYS)(109\ mg/L/day) = 2616\ mg/L$

$(24\ DAYS)(208\ mg/L day) = 4992\ mg/L$

→ MORE THAN PRESENT ∞ * ALL WOULD BE GONE (BUT 1^{st} ORDER WOULD OCCUR & LIMIT TO SOME EXTENT!)

$(2528\ mg/L - 50\ mg/L)(0.5\ MGD)(8.34)/1.2 \times 24 \approx 360\ HP$ for BOD_5

(50 mg/L: GUESS AT LEFTOVER FROM 1^{st} ORDER)

IF BOD_5 IS ~67% OF BOD_{TOT} THEN CONVERTING TO BOD_L REQUIRES A 1.5 MULTIPLIER.

POND 4 SUMMARY: COULD NEED UP TO 540HP IN WORST CASE, I.E., POND 4 IN LEAD USE & LOW POND KINETICS & HIGH STORAGE KINETICS. PLAN FOR ~540 HP WITH MINIMUM INSTALLATION BEING

EPA 625/1-79-011

PROCESS DESIGN MANUAL
FOR
SLUDGE TREATMENT AND DISPOSAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

Municipal Environmental Research Laboratory
Office of Research and Development

Center for Environmental Research Information
Technology Transfer

September 1979

The characteristics of sludge gas from several digester installations are shown in Table 6-9. A healthy digestion process produces a digester gas with about 65 to 70 percent methane, 30 to 35 percent carbon dioxide, and very low levels of nitrogen, hydrogen, and hydrogen sulfide. The carbon dioxide concentration of digester gas has been found to increase with the loading rate (60,88).

TABLE 6-9

CHARACTERISTICS OF SLUDGE GAS[a] (85)

Constituent	Values for various plants, percent by volume[b]							
Methane (CH_4)	42.5	61.0	62.0	67.0	70.0	73.7	75.0	73 - 75
Carbon dioxide (CO_2)	47.7	32.8	38.0	30.0	30.0	17.7	22.0	21 - 24
Hydrogen (H_2)	1.7	3.3	-[c]	-	-	2.1	0.2	1 - 2
Nitrogen (N_2)	8.1	2.9	-[c]	3.0	-	6.5	2.7	1 - 2
Hydrogen sulfide (H_2S)	-	-	0.15	-	0.01 - 0.02	0.06	0.1	1 - 1.5
Heat value, Btu/cu ft	459	667	660	624	728	791	716	739 - 750
Specific gravity (air = 1)	1.04	0.87	0.92	0.86	0.85	0.74	0.78	0.70 - 0.80

[a] Data from 1966 studies by Herpers and Herpers.

[b] Except as noted.

[c] Trace.

The hydrogen sulfide content of the gas is affected by the chemical composition of the sludge (84). Sulfur-bearing industrial wastes and saltwater infiltration tend to increase H_2S levels in sludge gas. However, metal wastes and metal ions added during chemical treatment or conditioning can reduce the amount of H_2S in the sludge by forming insoluble salts. H_2S, a major source of odors in digested sludge, can also be corrosive in the presence of moisture, by forming sulfuric acid.

Although the hydrogen content has some effect on the heat value, methane is the chief combustible constituent in digester gas. The high heat value for digester gas ranges between 500 to 700 Btu per cu ft (4.5 to 6.2 kg-kcal/m^3), with an average of about 640 Btu per cu ft (5.7 kg-kcal/m^3) (84). The high heat value is the heat released during combustion as measured in a calorimeter. However, gas engine efficiencies are usually based on the low heat value, which is the heat value of gas when none of the water vapor formed by combustion has been condensed. By way of comparison, sludge gas containing 70 percent methane and no other combustibles has a low heat value of 640 Btu per cu ft (5.7 kg-kcal/m^3) and a high heat value of 703 Btu per cu ft (6.26 kg-kcal/m^3) (84).

6.2.4.3 Supernatant Quality

Supernatant from an anaerobic digestion system can contain high concentrations of organic material, dissolved and suspended

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3[illegible] East Ashlan Ave.
[illegible]o, CA 93726
PHONE: (209) 445-5116
FAX: (209) 445-5910

10 September 1996

J.R. Wood, Inc.
P.O. Box 545
7916 West Bellevue Road
Atwater, CA 95301

CERTIFIED MAIL
P 846 404 467

TRANSMITTAL OF ADOPTED/AMENDED WASTE DISCHARGE REQUIREMENTS

Enclosed is an official copy of Order No. 96-213 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its last regular meeting.

LARRY W. BEATTY
Senior Engineer
RCE No. 15205

LML:fmc

Enclosures: Adopted Order
Standard Provisions

cc: Mr. John Youngerman, Division of Water Quality, State Water Resources Control Board, Sacramento
Department of Health Services, Office of Drinking Water, Fresno
Department of Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Merced County Environmental Health Department, Merced
Merced County Planning Department, Merced
Concerned Neighbors of J.R. Wood, Inc., Winton

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 96-213

WASTE DISCHARGE REQUIREMENTS
FOR
J. R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. J. R. Wood, Inc., (hereafter Discharger), a California corporation, submitted a Report of Waste Discharge (RWD) on 5 June 1995, and supplemental information on 18 October 1995, 6 February, 25 March, and 5 April 1996. The RWD describes a proposed increase in the discharge of wastes from its existing frozen food plant (FFP) and an accompanying expansion of process wastewater treatment and disposal facilities (WWTF). The FFP is at 7916 West Bellevue Road, Atwater. The property, of approximately 350 acres (Assessor's Parcel Nos. 143-25-09, 150-030-33, 150-030-15, 150-030-34, 150-030-35, 150-030-36, 150-030-37, 50-320-11, 56-025-19, 56-010-30, 56-010-31, and 56-010-31), is owned by the Discharger.

2. The RWD describes WWTF improvements for a proposed discharge flow increase resulting from relocation of substantial processing operations from similar plants in Sanger and Escalon owned and operated by the Discharger. The WWTF improvements include an increase in treatment capacity through additional treatment pond aeration and an increase in disposal capacity through the aquisition of an additional 37 acres for effluent disposal. Domestic sanitary wastes from FFP restrooms will continue to be discharged to an on-site septic tank and leachfield system that is regulated by Merced County and not this Order.

3. The existing FFP processes apricots, cantaloupes, melons, peaches, strawberries, and carrots. The Discharger was first issued Waste Discharge Requirements (WDRs) for the waste discharge from this FFP in 1976.

4. Waste Discharge Requirements Order No. 89-110, adopted by the Board on 23 June 1989, prescribes requirements for a discharge of a daily maximum and monthly average flow of 0.50 and 0.33 mgd, respectively, of food processing wastewater.

Due to continued odor problems through 1989 and lack of clear indications that the WWTF improvements were completed to adequately handle continual FFP expansions, Cease and Desist Order No. 81-003 remains in effect.

5. Order No. 89-110 must be revised to reflect the flow increase, an addition of disposal acreage (37 acres) from newly aquired property, and to incorporate current plans and policies of the Board.

6. The RWD reports that the discharge from the WWTF will be increased to monthly average maximum, maximum daily, and average annual flows of 0.94 mgd, 1.50 mgd, and 0.37 mgd, respectively. The maximum annual discharge is 143.6 million gallons. The projected wastewater flows and characteristics following treatment vary monthly depending on the produce that is processed and climactic factors, as shown below:

Month	Flow MG[1]	TFDS[2] mg/l	BOD_5[3] mg/l	N mg/l
Jan	≤4.9	427	162	0.9
Feb	≤4.1	298	476	0.9
Mar	≤3.8	573	152	0.8
Apr	≤6.3	540	312	5.4
May	≤7.4	768	541	1.0
Jun	≤15.0	435	652	10.5
Jul	≤24.0	461	1,910	23.9
Aug	≤23.0	830	2,789	61.0
Sep	≤22.0	917	2,569	75.5
Oct	≤12.8	793	1,318	49.2
Nov	≤12.3	469	837	53.7
Dec	≤8.0	539	528	11.2
Average	≤12.0	638	1,511	36.4

[1] Million gallons

[2] Total fixed dissolved solids

[3] 5-day, 20° Celsius biochemical oxygen demand. Projected monthly BOD_5 concentrations following treatment represent a 30-81 % reduction from untreated wastewater concentrations.

The pH of the effluent averages 7.43 pH units. Anhydrous ammonia is added to the anaerobic digester treatment unit to control pH and provide a source of nitrogen.

7. Treatment at the WWTF consists of parallel 0.030 inch and 0.040 inch mesh screens , an in-ground covered anaerobic digester, and 3 mechanically aerated treatment ponds connected in series. Screened solids are hauled off-site for use as animal feed. Treated wastewater is stored in 2 storage ponds where it is mechanically aerated to ensure adequate dissolved oxygen levels for odor control prior to being used to irrigate 290 acres of orchard, vine, and forage crops. The discharge supplies only approximately one-half of the crop water needs, so must be supplemented with on-site well and canal water. The disposal area consists of 141 acres of sudan grass and oats (one crop each), 14 acres of grapes, and 135 acres of peaches. Pond storage will be provided to accommodate rainfall from a 25-year annual rainfall season. The storage ponds allow the Discharger to apply the wastewater during periods of irrigation demand, thereby reducing peak organic loading as described in Finding Nos. 8 and 9.

8. Based on projected applied wastewater, monthly average total nitrogen concentrations, projected monthly average discharge flows, and crop acreage utilized for waste disposal, the projected nitrogen loading rates for the crop areas from wastewater are 213 lb/acre/year, 52 lb/acre/year, and 95 lb/acre/year for sudan grass and oats (one crop each), grapes, and peaches, respectively. These projected nitrogen application rates are less than the annual nitrogen utilization rate for sudan grass and oats (one crop each), grapes, and peaches of 440 lb/acre/year (325 lb/acre/year for sudan grass + 115 lb/acre/year for oats), 125 lb/acre/year, and 95 lb/acre/year, respectively, as established by the California Fertilizer Association.

9. Based on projected monthly BOD concentrations, projected amount of wastewater to be applied to each crop, and respective acreages of the irrigated crops, the maximum BOD loading rates for the sudan grass and oats, grape, and peach reclamation areas are 51 lb/ac/day, 32 lb/ac/day, and 38 lb/ac/day, respectively. These BOD loading rates to the reclamation areas are much less than the 100 lb/ac day maximum allowable loading rate for repeated BOD discharges to land recommended by the U.S. Environmental Protection Agency under typical conditions.

10. Inorganic salts in the wastewater discharge have the potential to migrate through the soil profile and adversely affect underlying ground water. The fixed dissolved solids (FDS) concentration is a measure of the concentration of inorganic salts in the effluent. Based on projected monthly FDS concentrations, projected wastewater application, and

respective acreages of the irrigated crops, the FDS loading rates for the grape, peach, and sudan grass plus oats reclamation areas are 2,221 lb/ac/yr, 2,082 lb/ac/yr, and 3,197 lb/ac/yr respectively. Crops grown and harvested in the reclamation areas will uptake and remove some of the applied salts. U.C. Davis research staff estimates crop salt uptakes for peaches, grapes, and sudan grass plus oats are 408 lb/acre/yr, 239 lb/acre/yr, and 1260 lb/ac/ yr, respectively. The resulting estimated FDS loading rates are less than the excess salt application presently allowed for dairies of 2025 lbs salt/ac/yr.

11. The FFP is in Sections 34 and 35, T16S, R12E, MDB&M, and Sections 2 and 3, T17S, R12 E, MDB&M, as shown in Attachment A, attached hereto and part of this Order by reference. The site lies within the Merced Hydrologic Area (No. 535.80), as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The site drains to the San Joaquin Valley floor.

12. There are many domestic and agricultural supply wells in the vicinity of the FFP. The ROWD reports that the current depth to ground water is greater than 50 feet. Ground water is of excellent mineral quality with an EC of approximately 200 μmhos/cm.

13. Soils in the area are Atwater sands that exhibit rapid permeability when uncompacted. Double ring infiltration tests conducted on compacted soils in the bottom of the storage ponds during construction document infiltration rates of 5×10^{-5} cm/sec to 1.7×10^{-5} cm/sec.

14. Prevailing winds during the summer are from the north to northwest, when irrigation with treated wastewater is highest. The surrounding area is agricultural and includes several residences within 1/4-mile of the FFP. A few of these residences are to the south and southeast and downwind of the 37-acre parcel.

15. On 26 July 1995, Merced County adopted an administrative permit for the construction of cold storage facilities associated with the plant expansion, and no special restrictions were placed on the waste discharge to land.

16. The Board adopted a Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin, Third Edition, (Basin Plan) which designates beneficial uses and contains water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

17. The beneficial uses of underlying ground water are domestic, industrial, and agricultural supply.

18. This proposed discharge of wastewater to land is exempt from Title 23, California Code of Regulations (CCR), Section 2510, et seq., (hereafter Chapter 15) requirements because the Board is issuing waste discharge requirements; the Discharger is complying with the Basin Plan by implementation of best management practices, and the discharge does not need to be managed as a hazardous waste pursuant to Title 22 CCR.

19. On 9 August 1996, the Board adopted a Negative Declaration for this project in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et seq.) and the State CEQA Guidelines. Compliance with this Order will prevent any significant adverse impact on water quality.

20. The permitted discharge is consistent with the antidegradation provisions of State Water Resources Control Board Resolution No. 68-16. The cropland will remove nutrients contained in the wastewater, thus minimizing impacts on water quality. The discharge is a beneficial reuse of wastewater and reduces the demand on ground and surface waters for crop irrigation. The expanded food processing capacity of the FFP increases the economic base of the local economy and therefore is considered to be a benefit to the people of the state.

21. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

22. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that J.R. Wood, Inc., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder at the Atwater Frozen Food Plant, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

2. Bypass or overflow of untreated or partially treated waste is prohibited.

3. Discharge of wastes to land areas within 50 feet of residential properties is prohibited.

4. Discharge of wastes other than frozen food processing wastewaters is prohibited.

5. Discharge of waste classified as 'hazardous' or 'designated', as defined in Sections 2521(a) and 2522(a) of Chapter 15, is prohibited.

B. **Discharge Specifications**

1. The discharge shall not exceed a maximum daily flow of 1.5 mgd or a monthly average flow of 0.94 mgd.

2. The annual discharge shall not exceed 144 million gallons.

3. The discharge shall not create conditions that result in objectionable odors perceivable beyond the limits of the wastewater treatment and disposal areas.

4. Effluent disposal pipelines shall be flushed to remove stagnant water that may result in violation of Discharge Specification B.3, above.

5. The dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/l.

6. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and rainfall from a 25-year annual rainfall season. Freeboard shall never be less than 2 feet (measured vertically).

7. Collected screenings, sludges, and other solids removed from liquid wastes shall be recycled or disposed of in a manner that is consistent with Chapter 15 and approved by the Executive Officer.

C. **Wastewater Reclamation Specifications**

1. Wastewater used for irrigation shall be managed to minimize erosion, runoff, and movement of aerosols from the disposal areas.

2. Areas irrigated with wastewater shall be managed to prevent breeding of mosquitos. More specifically:

   a. Tail water must be returned and all water must infiltrate completely within 48 hours after application.

   b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.

   c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitos shall not be used to store wastewater.

3. The perimeter of the disposal areas shall be graded to prevent ponding along public roads or public areas.

4. The resulting effect of the discharge on soil pH shall be such as to not exceed the buffering capacity of the soil profile (See Provision E.3 for a compliance schedule.)

5. Organic loading on the disposal area shall not exceed environmental conditions or 100 lbs of BOD/acre/day, whichever is less.

6. Application of water and nutrients shall not exceed accepted agronomic rates for the crops grown.

D. Ground Water Limitations

The discharge, in combination with other sources, shall not cause underlying ground water to contain waste constituents in concentrations statistically greater than background water quality.

E. Provisions

1. The Discharger shall comply with Monitoring and Reporting Program No. 96-213, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

2. The Discharger shall comply with all items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision (s)."

3. Prior to 9 August 1997, the Discharger shall submit a technical report to demonstrate whether it complies with Wastewater Reclamation Specification C.4. The report shall evaluate measured soil characteristics of the disposal area and the composition of the wastestream, and demonstrate that the effect of the discharge on soil pH has not exceeded and will not exceed the buffering capacity of the soil profile (to preclude leaching of soluble metals from soils).

   The report must be prepared under the direction of a California registered civil engineer or agricultural engineer with experience in industrial wastewater disposal. All reports are subject to the review and approval of the Executive Officer.

4. In the event of any change in control or ownership of land or waste discharge facilities described herein, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

   To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

5. The Discharger shall use the best practicable control techniques currently available to comply with this Order.

6. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer.

Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

7. A copy of this Order shall be kept at the Atwater FFP for reference by personnel responsible for wastewater who shall be familiar with its contents.

8. The Board will review this Order periodically and will revise requirements when necessary.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 August 1996

William H. Crooks

WILLIAM H. CROOKS, Executive Officer

LML:lml/fmc

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 96-213
FOR
J. R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

INFLUENT MONITORING

Influent samples shall be representative of the volume and nature of the discharge. The following is the influent monitoring program.

Constituent	Units	Type of Sample	Frequency
Flow	mgd	Continuous	Daily

POND MONITORING

Constituent	Units	Type of Sample	Frequency
Freeboard	feet	Measured	Weekly
Dissolved Oxygen	mg/l	Grab[1]	Weekly
Sludge Depth	inches	Grab	Annually

[1] Grab samples shall be obtained between the hours of 0800 and 0900 at a depth of 1-foot below the pond surface.

In conducting the pond monitoring, a log shall be kept of the pond conditions. The presence or absence of the following conditions shall be documented:

- floating or suspended matter
- odors

Any significant changes in pond operation shall be detailed.

MONITORING AND REPORTING PROGRAM
J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

EFFLUENT MONITORING

Effluent samples shall be collected just prior to discharge to the disposal area and should be representative of the volume and nature of the discharge. The following is the effluent monitoring program:

Constituent	Units	Type of Sample	Frequency
pH	pH units	Grab	Weekly
BOD_5[1]	mg/l	Grab	Weekly
Electrical Conductivity	µmhos/cm	Grab	Weekly
Total Dissolved Solids[2]	mg/l	Grab	Monthly
Nitrate Nitrogen	mg/l	Grab	Monthly
Kjeldahl Nitrogen	mg/l	Grab	Monthly
Total Nitrogen	mg/l	Grab	Monthly

[1] Five-day 20° Celsius biochemical oxygen demand.
[2] Determined by EPA Methods 160.1 and 160.4.

DISPOSAL SITE MONITORING

The following comprises the disposal site monitoring program:

a. The area of land (acreage of each crop, total acreage and location of each crop area) utilized for discharge of the waste stream shall be reported monthly.

b. Three representative locations shall be established for soil profile sampling of the disposal site. Two of these shall be within the disposal site, and one shall be outside to represent background conditions. The following is the disposal site monitoring program:

Constituent	Units	Type of Sample	Frequency
Nitrate-Nitrogen	mg/kg	6 feet[1]	Yearly[2]
Kjeldahl-Nitrogen	mg/kg	6 feet[1]	Yearly[2]
Total Nitrogen	mg/kg	6 feet[1]	Yearly[2]
pH	pH units	6 feet[1]	Yearly[2]

[1] Samples shall be taken at 2-foot depth increments.

[2] Each location shall be sampled in either the month of May or June.

GROUND WATER MONITORING

By **9 November 1996**, the Discharger shall submit a work plan for a ground water monitoring network with a schedule for implementation, in or near all areas where the wastewater is disposed of by the Discharger. The monitoring network shall consist of one or more background monitoring wells and sufficient downgradient wells to determine flow direction and gradient, and to monitor disposal areas. All well locations and construction features are subject to the prior approval of the Executive Officer and must be sufficient to monitor potential impacts of the disposal operation on the uppermost ground water aquifer. Existing wells proposed for inclusion in the program shall have known construction features (depth, length of perforated interval, surface seal, etc.). Wells shall be perforated in only the upper portion of the aquifer and shall comply with standards for construction and installation of monitoring wells in accordance with *California Well Standards, Bulletins 74-81 and 74-90*, prepared by the California Department of Water Resources. **Within 30 days following approval** of the workplan by the Executive Officer, the discharger shall implement the proposed ground water monitoring well network.

Samples shall be taken monthly from approved background monitoring well(s) for one year and analyzed for the parameters specified below. Data from these analyses shall be reported to the Board **within 30 days after said year ends**, for use in determining water quality protection standards.

MONITORING AND REPORTING PROGRAM
J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

If subsequent sampling of the background monitoring well(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste disposal activities, the discharger may request modification of the water quality protection standards.

The downgradient wells shall constitute "points of compliance" (POCs). In conjunction with background monitoring, monitoring of POCs will enable one to determine compliance with water quality protection standards. This information shall be displayed on a water flow net diagram for the site. Water samples shall be collected from wells in the approved monitoring network and analyzed as follows:

Constituent	Units	Type of Sample	Sampling Frequency
Depth	feet[1]	measurement	Monthly
Minerals[2]	mg/l	Grab	Annually
Electrical Conductivity	μmhos/cm	Grab	Annually
pH	pH units	Grab	Annually
Total Dissolved Solids[3]	mg/l	Grab	Monthly

1 The Discharger shall report ground water levels as elevations with respect to mean sea level as well as depth below ground surface.

2 Mineral analyses shall include calcium, carbonate, chloride, fluoride, iron, magnesium, nitrate, potassium, sodium, sulfate, and total phosphorous.

3 Determined by EPA methods 160.1 and 160.4.

Following each sampling event (after establishment of water quality protection standards), the Discharger shall determine whether there is a statistically significant increase over water quality protection standards for each paramenter and constituent analyzed. If the Discharger or the Board finds there is a statistically significant increase in indicator paramenters or waste constituents over the water quality protection standards at the POCs, the discharger shall notify the Board, or acknowledge the Board's findings, and submit, within 90 days, either a technical report with a plan and time schedule for implementing a verification monitoring program or a report demonstrating water quality protection standards have been exceeded and assess the horizontal and vertical extent of the impact.

MONITORING AND REPORTING PROGRAM
J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

If the Discharger, through a verification monitoring program, or the Board verifies that water quality protection standards have been exceeded at or beyond the POCs, the Discharger shall notify the Board, or acknowledge the Board's findings, and submit a technical report within **90 days.** The report must contain a plan and time schedule for implementing a corrective action program designed to achieve compliance with water quality protection standards.

REPORTING

Monthly monitoring reports shall include the results of influent monitoring, pond monitoring, effluent monitoring, disposal site monitoring, and ground water monitoring taken monthly or more frequently. Monthly monitoring reports shall be submitted to the Board by the **20th day of the following month.** Quarterly and annual monitoring results shall be submitted by the **20th day of the month** following each calendar quarter and year, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the consituents, and the concentrations are readily discernible. The data shall be summarized in such a mannner that illustrates clearly whether the Discharger complies with waste discharge requirements, including calculation of all averages, etc.

If the discharger monitors any pollutant at the locations desigated herein more frequently than is required by this Order, the results of such monitoring shall be included in the discharge monitoring report.

The Discharger may also be requested to submit an annual report to the Board with tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

By **31 January of each year,** the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names and telephone numbers of persons to contact regarding emergency and routine situations concerning this permit.

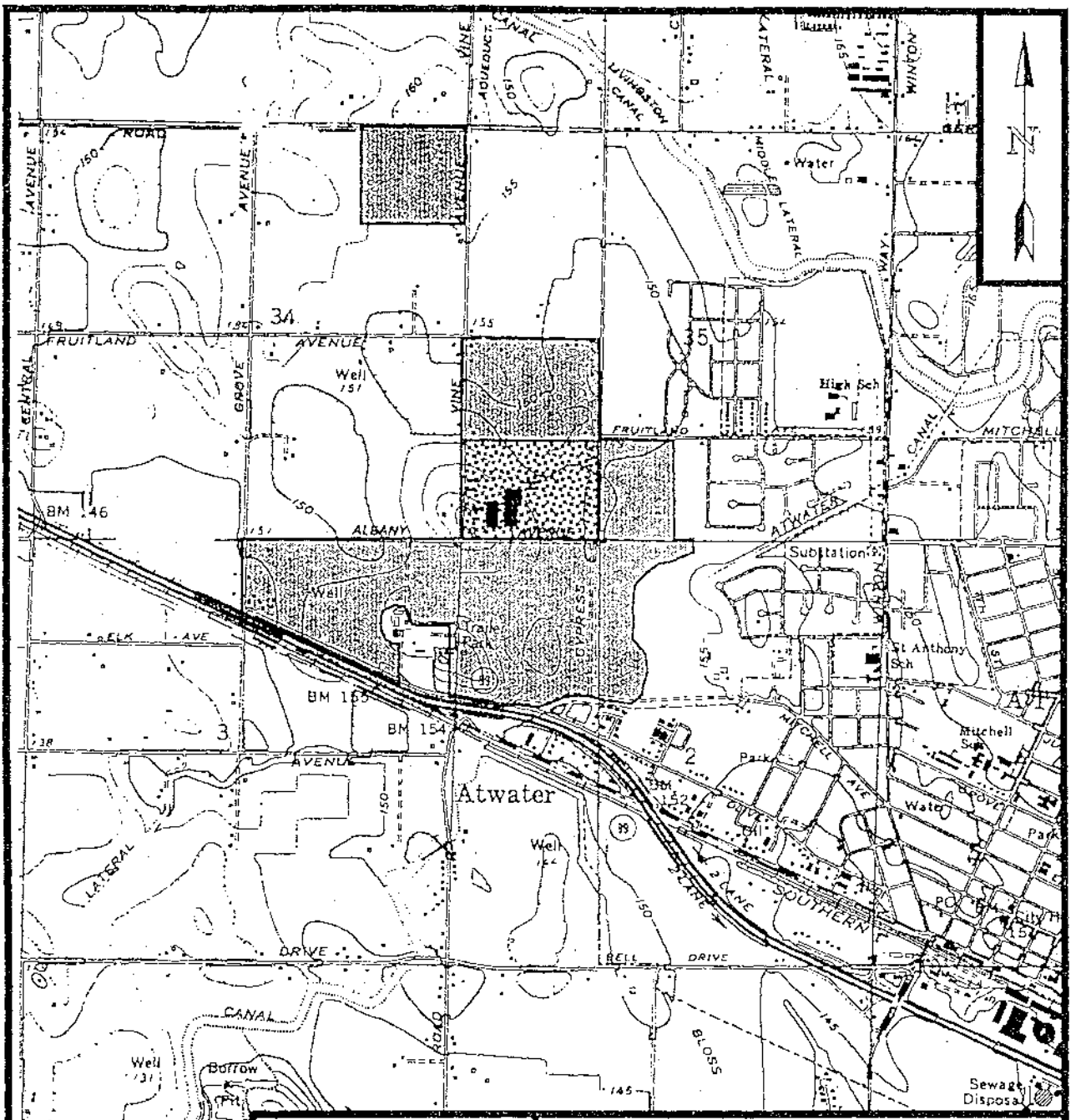
b. A certified statement of when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who did the calibration (Standard Provision C.4).

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision B.3. The Discharger shall implement the above monitoring program on the first day of the month following the effective date of this Order.

Ordered by: _____
WILLIAM H. CROOKS, Executive Officer

9 August 1996
(Date)

LML:fmc



LEGEND

ATTACHMENT A
Vicinity Map

J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

Secs. 34, 35, T16S, R12E, MDB&M and
Secs. 2, 3, T17S, R12E, MDB&M
Arena, Atwater, Cressey and Winton USGS Quads
Scale: 1" = 2000'

INFORMATION SHEET

J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

J.R. Wood, Inc. (hereafter Discharger) submitted a complete Report of Waste Discharge (RWD) in March 1996 to reflect a proposed flow increase and addition of disposal acreage (37 acres) from newly aquired property at its Atwater frozen food plant (FFP). The total property of approximately 350 acres is owned by the Discharger.

The FFP processes apricots, cantaloupes, melons, peaches, strawberries, and carrots. The Discharger proposes to increase flows to monthly average maximum, maximum daily, and average annual discharges of 0.94 mgd, 1.50 mgd, and 0.37 mgd, respectively, of food processing wastewater. The projected wastewater characteristics and flows vary monthly depending on the produce that is processed. The RWD reports the treated wastewater as having chemical constituent concentrations of total fixed dissolved solids, BOD, and nitrogen of 298 to 917 mg/l, 162 to 2,789 mg/l, and 0.8 to 75.5 mg/l, respectively. The wastewater characteristics described in the Initial Study and Negative Declaration for the proposed expanded discharge apply to untreated wastewater.

Process wastewater is screened, digested anaerobically, aerated in ponds, and stored in holding ponds prior to being used for irrigation of 290 acres of orchard, vine, and forage crops. The discharge supplies approximately one half of the crop water needs, and therefore is supplemented with on-site well and canal water. The disposal area consists of 141 acres of sudan grass and oats (one crop each), 14 acres of grapes, and 135 acres of peaches. Pond storage will be provided to accommodate a 25-year annual rainfall season. Double ring infiltration tests were conducted on compacted soils in the bottom of the storage ponds during construction and show infiltration rates of 5×10^{-5} cm/sec to 1.7×10^{-5} cm/sec.

Based on projected applied wastewater, monthly average total nitrogen concentrations, projected monthly average discharge flows, and crop acreage utilized for waste disposal, the projected nitrogen loading rates for the crop areas are 213 lb/acre/year, 52 lb/acre/year, and 95 lb/acre/year for sudan grass and oats (one crop each), grapes, and peaches, respectively. These projected nitrogen application rates are less than the annual nitrogen utilization rate for sudan grass and oats (one crop each), grapes, and peaches of 440 lb/acre/year (325 lb/acre/year for sudan grass + 115 lb/acre/year for oats), 125 lb/acre/year, and 95 lb/acre/year, respectively, as established by the California Fertilizer Association.

J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

Based on projected monthly BOD concentrations, projected amount of wastewater to be applied to each crop, and respective acreages of the irrigated crops, the maximum BOD loading rates for the sudan grass and oats, grape, and peach reclamation areas are 51 lb/ac/day, 32 lb/ac/day, and 38 lb/ac/day, respectively. These BOD loading rates to the reuse areas are much less than the 100 lb/ac/day recommended maximum loading rate for repeated BOD application to landby the U.S. Environmental Protection Agency under typical conditions.

Inorganic salts in the wastewater discharge have the potential to migrate through the soil profile and adversely affect underlying ground water. The fixed dissolved solids (FDS) concentration is a measure of the inorganic salts in the effluent. Based on projected monthly FDS concentrations, projected wastewater application, and respective acreages of the irrigated crops, the FDS loading rates for the grape, peach, and sudan grass plus oats reclamation areas are, 2,221 lb/ac/yr, 2,082 lb/ac/yr, and 3,197 lb/ac/yr respectively. Crops grown and harvested in the reclamation areas will uptake and remove some of the applied salts. U.C. Davis research staff estimates crop salt uptakes for peaches, grapes, and sudan grass plus oats are 408 lb/acre/yr, 239 lb/acre/yr, and 1260 lb/ac/ yr, respectively. The resulting estimated FDS loading rates are less than the excess salt application presently allowed by the Board for dairies of 2025 lbs salt/ac/yr.

There are many domestic and agricultural supply wells in the vicinity of the FFP. The RWD reports that the current depth to ground water is greater than 50 feet. Ground water is of excellent mineral quality, with an EC of approximately 200μmhos/cm.

The site drains to the San Joaquin Valley floor.

On 9 August 1996, the Board adopted a Negative Declaration for this project in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et seq.) and the State CEQA Guidelines. Compliance with this Order will prevent any significant adverse impact on water quality.

LML:lml/fmc:8/09/96

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3614 East Ashlan Ave.
Fresno, CA 93726
PHONE: (209) 445-5116
FAX: (209) 445-5910

10 September 1996

J.R. Wood, Inc.
P.O. Box 545
7916 West Bellevue Road
Atwater, CA 95301

CERTIFIED MAIL
P 846 404 468

TRANSMITTAL OF ADOPTED RESOLUTION FOR J.R. WOOD, INC., ATWATER FROZEN FOOD PLANT, MERCED COUNTY

Enclosed is an official copy of Resolution No. 96-212 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its last regular meeting.

LARRY W. BEATTY
Senior Engineer
RCE No. 15205

LML:fmc

Enclosures: Adopted Order
Standard Provisions

cc: Mr. John Youngerman, Division of Water Quality, State Water Resources Control Board, Sacramento
Department of Health Services, Office of Drinking Water, Fresno
Department of Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Merced County Environmental Health Department, Merced
Merced County Planning Department, Merced
Concerned Neighbors of J.R. Wood, Inc., Winton

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. 96-212

APPROVING THE INITIAL STUDY
AND NEGATIVE DECLARATION
FOR
J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

WHEREAS, on 5 June 1995, J.R. Wood, Inc., submitted a Report of Waste Discharge to the California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) for an increase in the discharge and disposal area for frozen food processing waste to a daily maximum and monthly average maximum discharge of 1.50 mgd and 0.94 mgd, respectively, to 290 acres of land; and

WHEREAS, the Board assumed the lead agency role for this project under the California Environmental Quality Act and conducted an Initial Study in accordance with Title 14, California Code of Regulations, Section 15063, entititled "Guidelines for the implementation of the California Environmental Quality Act"; and

WHEREAS, mitigation measures included in the project and identified in the Negative Declaration are expected to mitigate all potential environmental impacts, including impacts on water quality, to a less than significant level; and

WHEREAS, copies of the Initial Study and proposed Negative Declaration were transmitted to all agencies and persons known to be interested in this matter; and

WHEREAS, comments received have been addressed; and

WHEREAS, the Board considered all testimony and evidence at a public hearing held on 9 August in Sacramento, California, and good cause was found to approve the Initial Study and adopt a Negative Declaration; Therefore, be it

RESOLVED, that the California Regional Water Quality Control Board, Central Valley Region. approves the Initial Study and Negative Declaration for J.R. Wood, Inc, Atwater Frozen Food Plant, Merced County.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 August 1996.

William H. Crooks

WILLIAM H. CROOKS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3614 East Ashlan Ave.
Fresno, CA 93726
PHONE: (209) 445-5116
FAX: (209) 445-5910

SEP 13 1996

12 September 1996

Received by OMR
MAR 15 2001

To Dovik

Mr. Jim Wood, President
J.R. Wood, Inc.
7916 Bellevue Rd.
P.O. Box 545
Atwater, CA 95301

TRANSMITTAL OF ADOPTED RESCISSION ORDER NO. 96-189, RESCINDING CEASE AND DESIST ORDER NO. 81-033, AND NOTIFICATION OF RESCISSION OF CLEAN-UP AND ABATEMENT ORDER NO. 78-LSO-01, J.R. WOOD, INC., FROZEN FOODS OPERATION, MERCED COUNTY

Enclosed is an official copy of Order No. 96-189 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its 8 August 1996 meeting.

Also, because of your recent improvements to the wastewater treatment and disposal facilities, the threat of nuisance conditions originally identified in Clean-up and Abatement Order No. 78-LSO-01 has been eliminated. Based on these improvements, Order No. 78-LSO-01 is hereby rescinded.

WILLIAM H. CROOKS, Executive Officer

by: _____
LOREN J. HARLOW, Assistant Executive Officer

LML:lml/fmc

Enclosure: Adopted Order

cc: Department of Health Services, Office of Drinking Water, Fresno
Department of Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Merced County Environmental Health Services Department, Merced
Merced County Planning Department, Merced

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 96-189

RESCISSION OF CEASE AND DESIST ORDER NO. 81-033
FOR
J.R. WOOD, INC.
FROZEN FOODS OPERATIONS
MERCED COUNTY

The California Regional Water Quality Control Board, Central Valley Region (hereafter Board), finds that:

1. The Board adopted Cease and Desist Order No. 81-033 on 27 February 1981 against J.R. Wood, Inc., Frozen Foods Operations (hereafter Discharger), directing the company to comply with Waste Discharge Specifications A.1 and A.8.c of Waste Discharge Requirements Order No. 79-158.

2. The Discharger has achieved compliance with the Cease and Desist Order.

3. The issuance of this Order is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Section 15321(a)(2), Title 14, California Code of Regulations.

4. The Board, on 8 August 1996, held a hearing and considered all evidence on this matter.

IT IS HEREBY ORDERED that Cease and Desist Order No. 81-033 is rescinded.

I, WILLIAM H.CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 8 August 1996.

William H. Crooks

WILLIAM H. CROOKS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

3614 E. Ashlan Avenue
Fresno, CA 93726
Phone (209) 445-5116
FAX (209) 445-5910

Cal/EPA

Pete Wilson, *Governor*

15 April 1998

Mrs. Terri Hoff, Research and Development Manager
J.R. Wood, Inc.
P.O. Box 545
Atwater, CA 95301

GROUNDWATER MONITORING WELL LOCATIONS AND WELL DESIGN APPROVAL

We have reviewed your January 1998 report, *Study of Groundwater Monitoring Well Locations* that describes the proposed locations and construction design of three groundwater monitoring wells at the J.R. Wood, Inc. Atwater Frozen Food Plant (Plant). The Plant's Waste Discharge Requirements (WDRs) Order No. 96-213 requires you to install a groundwater monitoring network consisting of one or more background monitoring wells and sufficient downgradient wells to determine flow direction and gradient, and to monitor discharge areas.

According to your report, springtime groundwater levels are about 63 feet below ground surface in the vicinity of the Plant and groundwater typically flows east to west. You propose to locate one upgradient well on the eastern-most edge of the Plant's property, and position two downgradient wells to maximize the catch of groundwater flowing under reclamation areas. The monitoring wells will be from about 80 feet to about 100 feet deep and have sanitary seals extending down from the ground surface to the uppermost aquifer.

We find that the proposed locations and design of your three groundwater monitoring wells should provide sufficient background and downgradient groundwater data to monitor the potential impacts of the Plant's wastewater disposal operation on the uppermost groundwater aquifer. We therefore approve your workplan. According to the Plant's WDRs, J.R. Wood shall implement the proposed groundwater monitoring network by **15 May 1998**.

We may require that you install additional monitoring wells if staff determines that the network is insufficient to determine the Plant's impact on underlying groundwater.

If you have any questions, please call Jo Anne Kipps of this office at (209) 445-5145.

BERT E. VAN VORIS
Supervising Engineer
RCE No. 24105

JLK: jlk

cc: California Department of Water Resources, San Joaquin District
California Department of Health Services, Sacramento

7308

J. R. Wood, Inc.

Atwater, California

STUDY OF

GROUNDWATER MONITORING WELL LOCATIONS

January, 1998

ECO:LOGIC Engineering
2220 Douglas Boulevard, Suite 220
Roseville, California 95661

TABLE OF CONTENTS

Purpose

The purpose of this study is to provide the rationale and technical support data for the location of additional groundwater monitoring wells for the J. R. Wood, Inc., food processing wastewater reclamation system located near Atwater, California. The California Regional Water Quality Control Board (hereinafter, Regional Board) has requested that additional groundwater monitoring wells be installed at the J. R. Wood, Inc., system because of its recent expansion.

It is expected that the Regional Board will approve the monitoring well locations and monitoring well design proposed herein. Once approved, J. R. Wood, Inc., will retain a licensed well contractor to construct the monitoring wells to State of California standards (Department of Water Resources [hereinafter, DWR] Bulletin 74-90) under the direct supervision of a licensed engineer or geologist who will file the Well Logs for the monitoring wells with the State.

J. R. Wood, Inc., will report the completion of the monitoring wells to the Regional Board and provide the Regional Board with copies of the Well Logs. J. R. Wood, Inc., will begin monitoring water quality in the wells per the Waste Discharge Requirements as soon as the wells are completed.

Based on approval by the Regional Board, Department of Health Services, and DWR of the groundwater monitoring well locations and design proposed, herein, and on normal rainfall patterns, J. R. Wood, Inc., intends to have the new wells installed and operational by the end of April (i.e., before the onset of the main food processing season).

Background

The J. R. Wood, Inc., facility at Atwater treats its food processing wastewater in aerated treatment ponds (sanitary wastewater is handled by a separate system). The treated food processing wastewater is stored in aerated reservoirs with compacted soil bottoms to limit the loss of stored water by percolation. The stored water is applied to J. R. Wood, Inc., crops at the site at agronomic rates for water and nitrogen. The water is also applied to the crops in compliance with the salt application criteria developed by the Regional Board in its Dairy Guidelines. A layout of the J. R. Wood, Inc., food processing facility and wastewater reclamation area is shown in Figure 1.

Regarding groundwater monitoring, extremely important concepts relative to the J. R. Wood, Inc., operation are that 1) the treated wastewater is applied to the crops at agronomic rates, and 2) virtually all of the land surrounding the J. R. Wood, Inc., facility is in agricultural use and is also irrigated at agronomic rates. Thus, the flux of surface applied irrigation water to underlying groundwater from the J. R. Wood, Inc., facility is very low and about the same as from surrounding ranches. Consequently, there is no reason to think that there is any significant groundwater mound under the J. R. Wood, Inc., facility. Therefore, the groundwater levels and contour lines in and around the J.

R. Wood, Inc., facility are expected to be similar to those measured and modeled annually by DWR.

Groundwater Conditions

Groundwater contour maps developed by DWR for the greater Atwater area for the past 10 years of record (1987-1996) are presented in Appendix A. This span of years includes clusters of "critically dry" and "wet" years, and therefore, should be representative of the groundwater levels and directions of flow that can be expected through the course of such natural events in years to come.

A synopsis of the DWR groundwater data at the J. R. Wood, Inc., facility as to groundwater depth, groundwater flow direction and gradient, and the relative wetness or dryness of the year is presented in Table 1. From this information it can be concluded that:

1. Groundwater flow is typically from east to west with minor variations causing flow to come from ESE to ENE.

2. Groundwater levels have continued to fall in wet years following the critically dry years. The net groundwater level decline has been about 2 feet per year. Spring depths to groundwater are, now, as much as 63 feet. The depth to groundwater is expected to increase over time based on recent groundwater level trends.

3. The groundwater gradient is typically in excess of 1.0 ft/1,000 ft.

4. The use of groundwater by the nearby City of Atwater does not appear to cause a "cone of depression" of groundwater levels of sufficient magnitude to be evident on the DWR maps that would imply the possibility of a groundwater flow reversal from the J. R. Wood, Inc., facility to the east towards Atwater.

In recent years, DWR no longer prepares groundwater maps for Spring and Fall, only Spring. However, DWR has limited Spring and Fall groundwater data for the Atwater area indicating seasonal groundwater falls of as much as 16 feet with a typical value of about 7 feet. This seasonal drop in groundwater level must be considered in setting the depths of the new wells.

Locations of New Wells

Three new monitoring wells are proposed to supplement the existing three "test" wells (see Figure 1). Of the three new wells, one will be an upgradient or "background" well and two will be downgradient wells.

Upgradient Well. The upgradient well should be located on the eastern-most edge of the J. R. Wood, Inc., property away from the possible effects of irrigation canals which may leak. The best location appears to be in J. R. Wood, Inc., property block # 047 (see Figure 2). The well should be located about 900 feet south of Fruitland Avenue and about 150 feet from the eastern property line. This site 1) provides minimum

horizontal separation from possible sources of potential pollution per DWR Bulletin 74-90, 2) keeps the well away from irrigation canals, and 3) is best aligned with Downgradient Well "South" considering the other constraints on locating an upgradient well. The exact location will be determined in the field by J. R. Wood, Inc., staff and the engineer or geologist supervising installation of the well.

Downgradient Wells. The two downgradient wells will be located in J. R. Wood, Inc., property blocks # 093 and #041 in the approximate locations shown in Figure 2. The block # 093 well is located approximately 150 feet east of the Fruitland Lateral canal and approximately 900 feet south of Liberty Avenue. The block # 041 well is located approximately 1,200 feet east of Grove Avenue and 500 feet south of Bellevue Road. These locations maximize the "catch" of water flowing under the J. R. Wood, Inc., reclamation areas based on groundwater flowing from the east and ranging from ESE to ENE (see Figure 2 for estimates of catchment areas). With both wells, the locations will be determined in the field by J. R. Wood, Inc., staff and the engineer or geologist supervising installation of the wells.

Design of New Wells

Based on the current depth to groundwater (60+ feet), the current trend of decline in groundwater levels (2 feet/year), and an annual Spring and Fall temporary groundwater level decline of about 7 feet, the monitoring wells should have a depth of from about 80 feet to about 100 feet to ensure water in the wells throughout the year, and over the life of the wells.

Based on available well logs for the J. R. Wood, Inc., facility site (see Appendix B), a sand stratum occurs from approximately 65 feet deep to approximately 100 feet deep below ground surface (BGS). This stratum appears to be underlain by grey clay and sandy brown clay, and overlain by grey clay.

A sand stratum located at approximately 65 to 100 feet (BGS) may be tapped by domestic water wells in the area. Considering that the J. R. Wood, Inc., monitoring wells will be located in areas where treated food processing wastewater (which should contain only incidental human pathogens, as does typical surface irrigation water) is being reclaimed, it is recommended that the wells have sanitary seals extending down from ground surface to the top of the aforementioned sand stratum. The well screen should terminate at the bottom of the sand stratum. The well casing should include a "nose piece" in which sand can accumulate and be removed periodically by bailing or other techniques. The specifics of the monitoring well design are shown in Figure 3. The larger than typical concrete bases are recommended because the wells are located in a reclamation area. The well casing material and drilling/installation techniques shall be specified by a professional civil engineer with experience in monitoring wells of this depth in similar soils and groundwater conditions. The wells are to be disinfected per the procedures recommended by DWR. The wells are to be constructed per all pertinent standards.

Written approval of the monitoring well locations and design must be received from the Department of Water Resources, Department of Health Services, and Regional Water Quality Control Board prior to installation of these wells.

Table 1

DWR WATER AND GROUNDWATER INFORMATION

Year	DWR Water Year Index (a)	Groundwater Data				
		Elevation, Feet	Depth to, Feet (b)	Flow Direction	Gradient, ft/1,000 ft.	Localized Variability
1987	Critical (c)	113	~42	E to ENE	1.9	Minor
1988	Critical (c)	116	~39	East	1.0	None
1989	Critical (c)	113	~42	ENE to ESE	1.5	Minor
1990	Critical (c)	106	~49	ENE to ESE	1.0	Minor
1991	Critical (c)	103	~52	E to SE	0.9	Minor
1992	Critical (c)	99	~56	East	1.3	None
1993	Wet	93	~62	East	0.5	None
1994	Critical (a)	97	~58	East	0.9	None
1995	Wet	92	~63	East	1.1	None
1996	Wet	94	~61	E to ENE	0.9	Minor

(a) See Appendix C.
(b) Based on a land surface elevation of about 155 feet (MSL).
(c) Critically dry year.

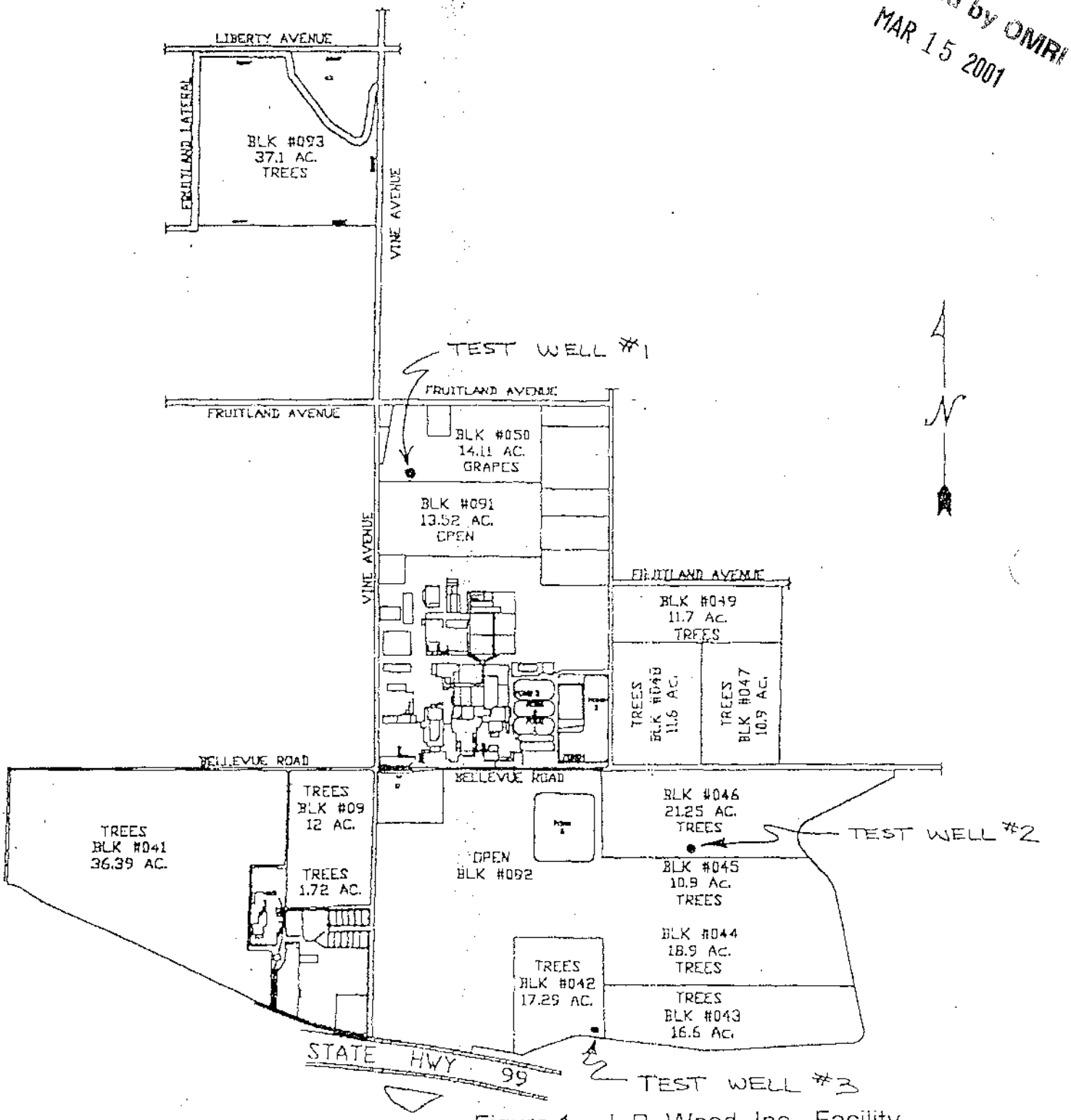


Figure 1 – J. R. Wood, Inc., Facility

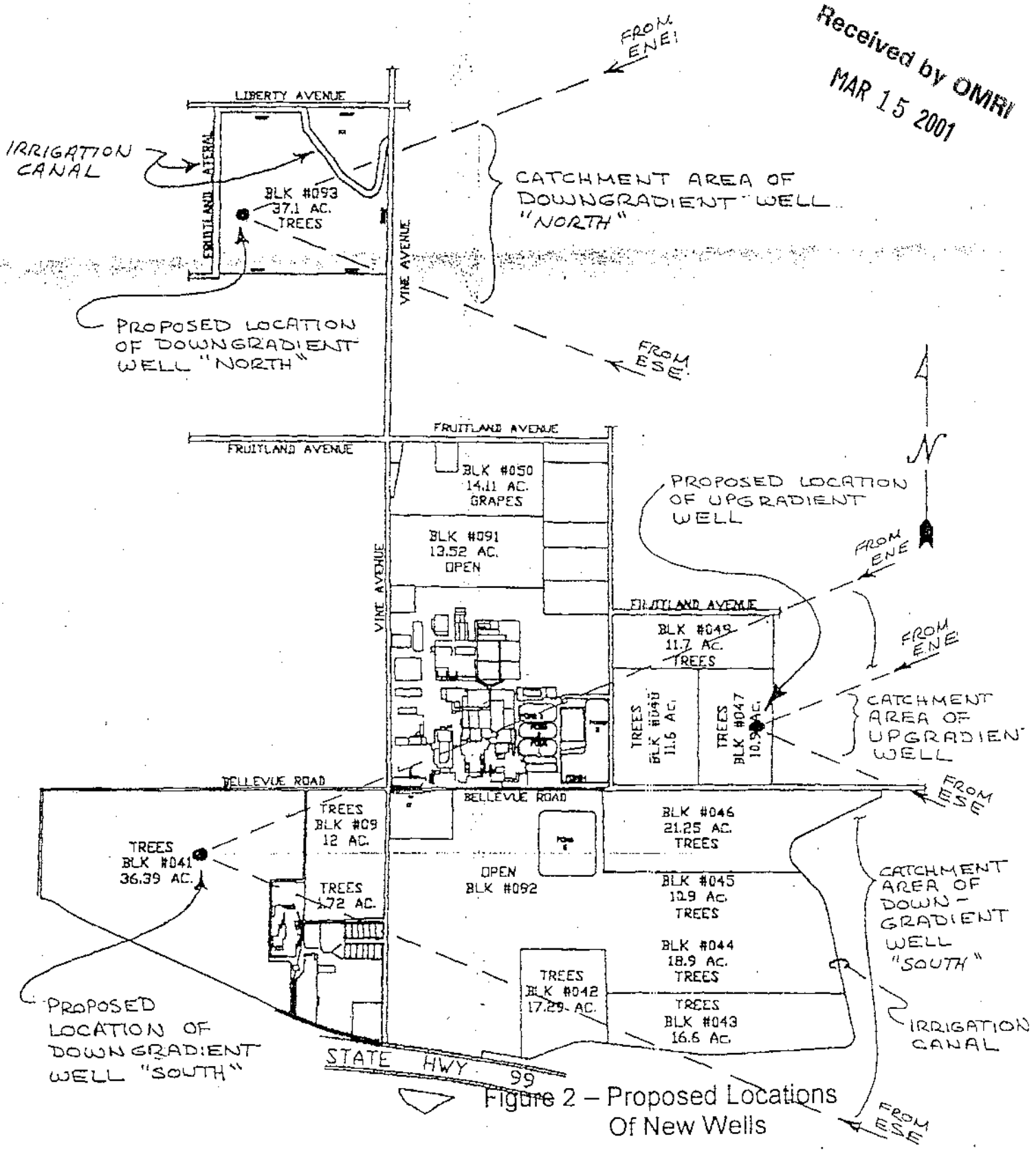
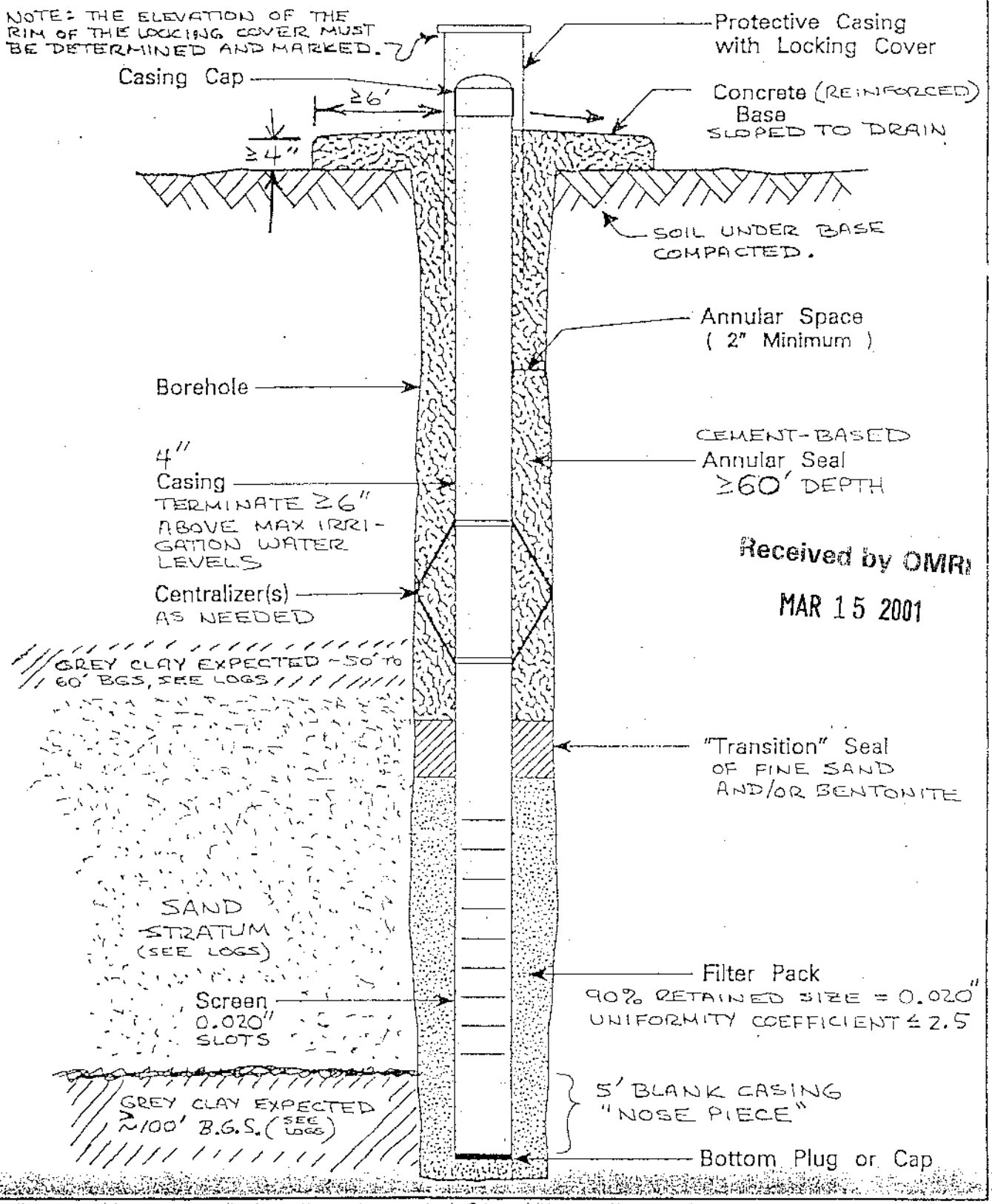


Figure 2 – Proposed Locations Of New Wells

Figure 3. CROSS SECTION OF A TYPICAL MONITORING WELL

(NOTE: Schematic, not to scale)



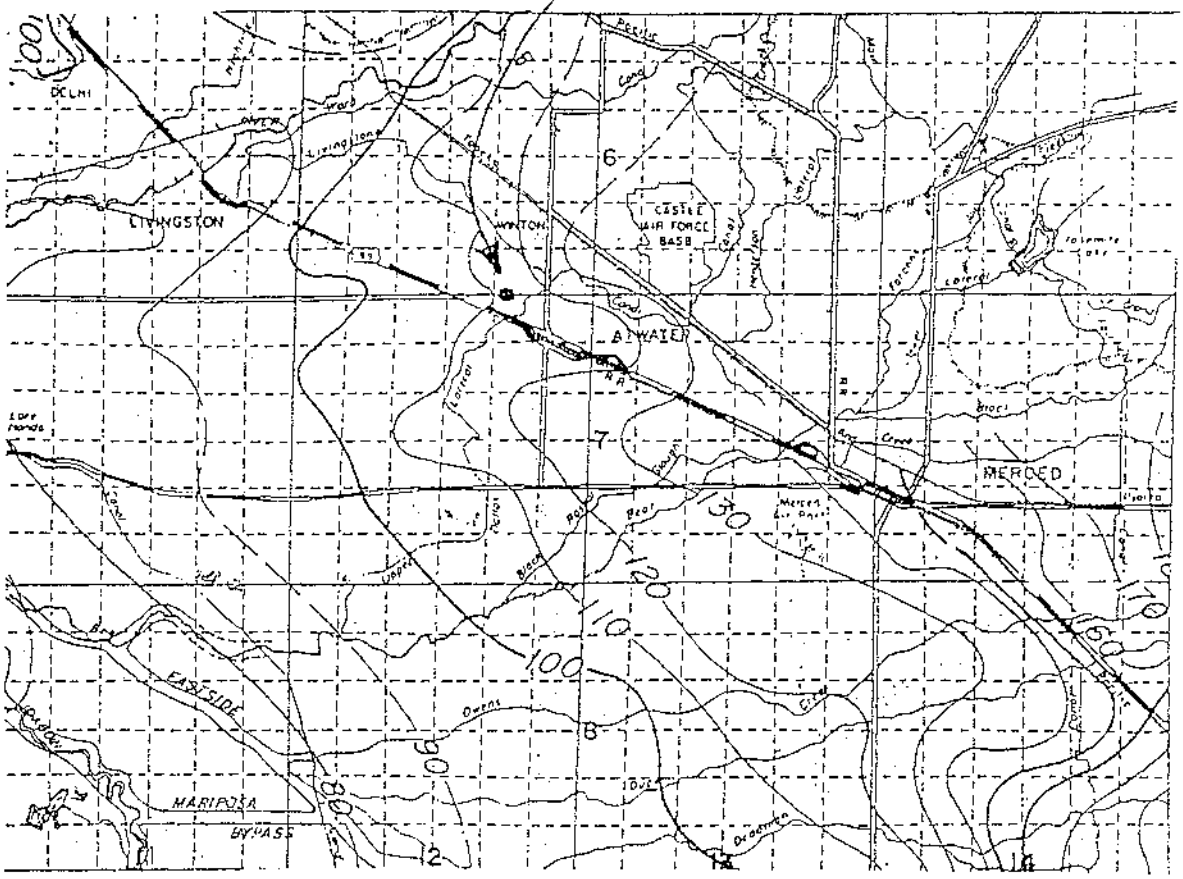
ADAPTED FROM: DWR BULLETIN 74-90

Figure 3 – Proposed Monitoring Well Design

APPENDIX A

DWR Groundwater Data

J.R. WOOD FACILITY
(SO MARKED ON ALL SUBSEQUENT MAPS)

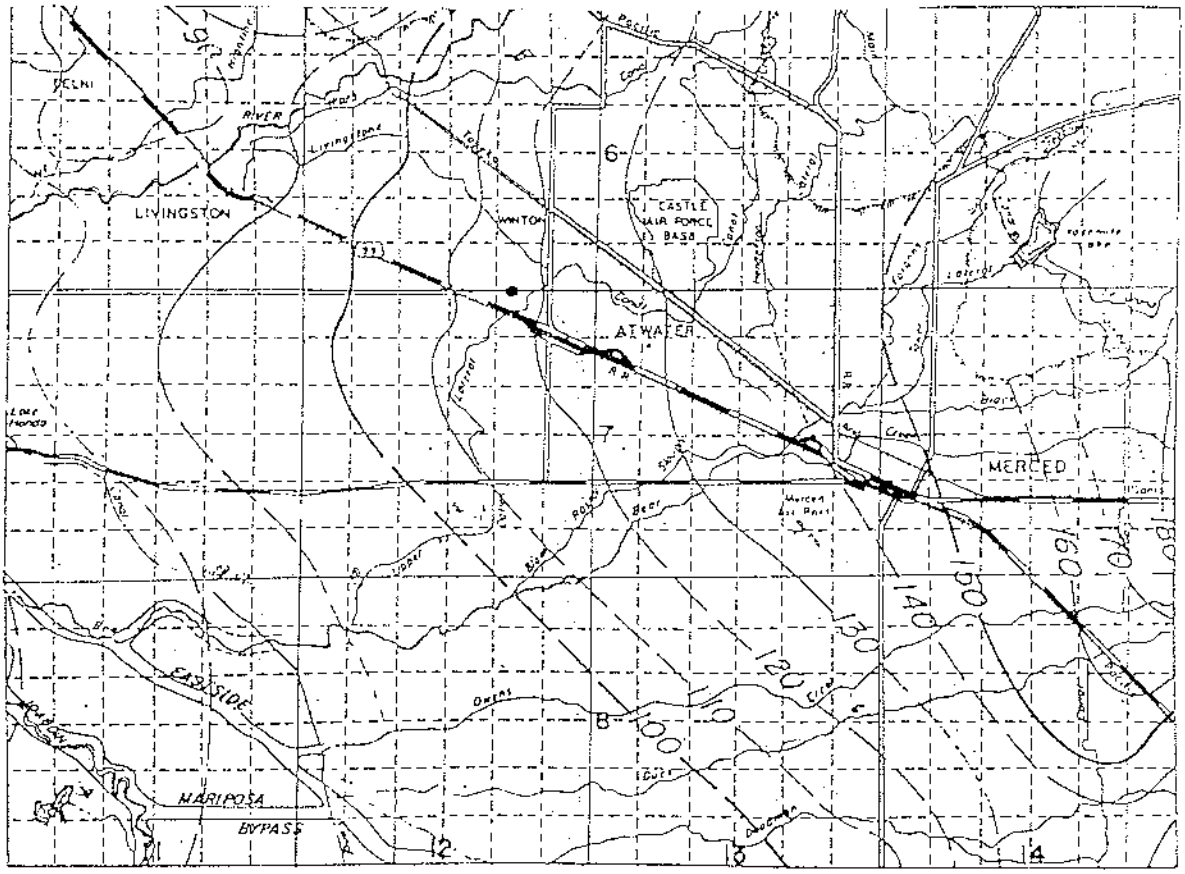


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1987

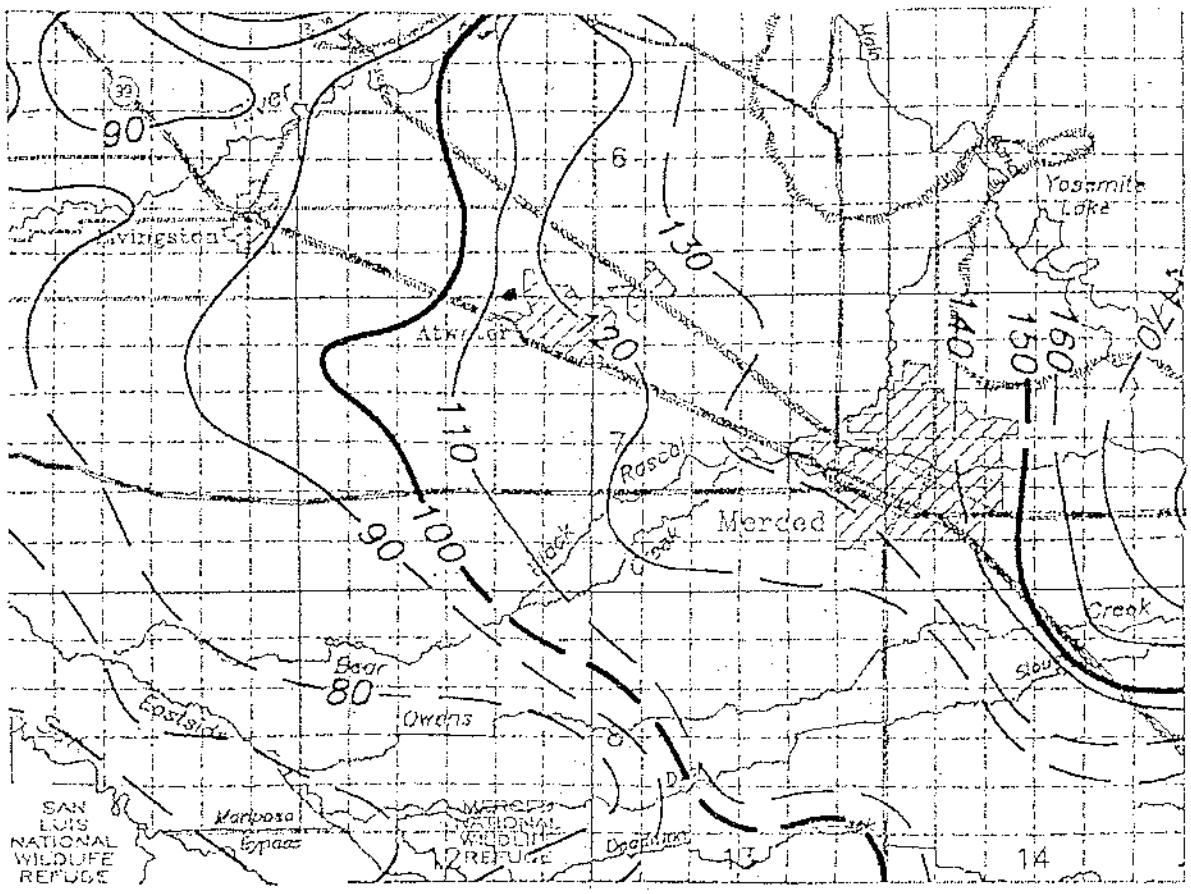


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1988

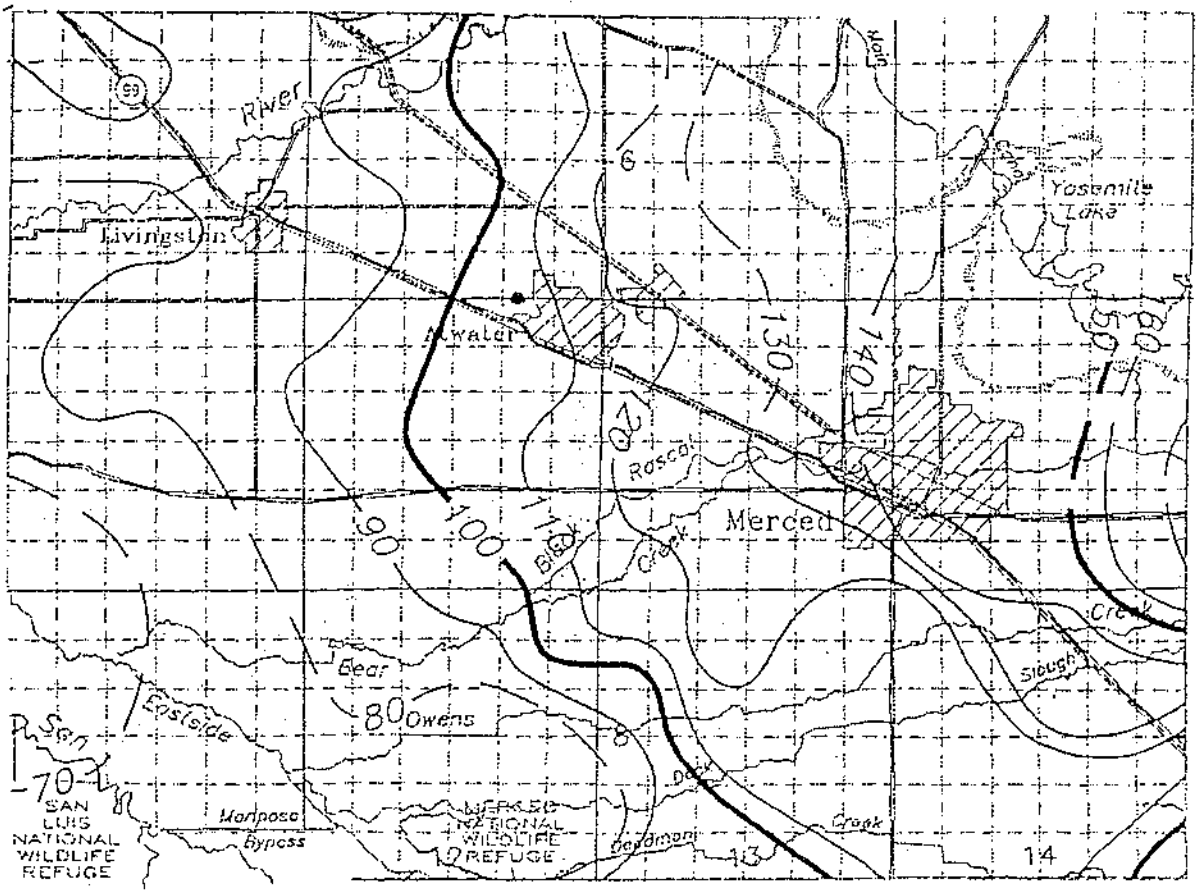


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1989

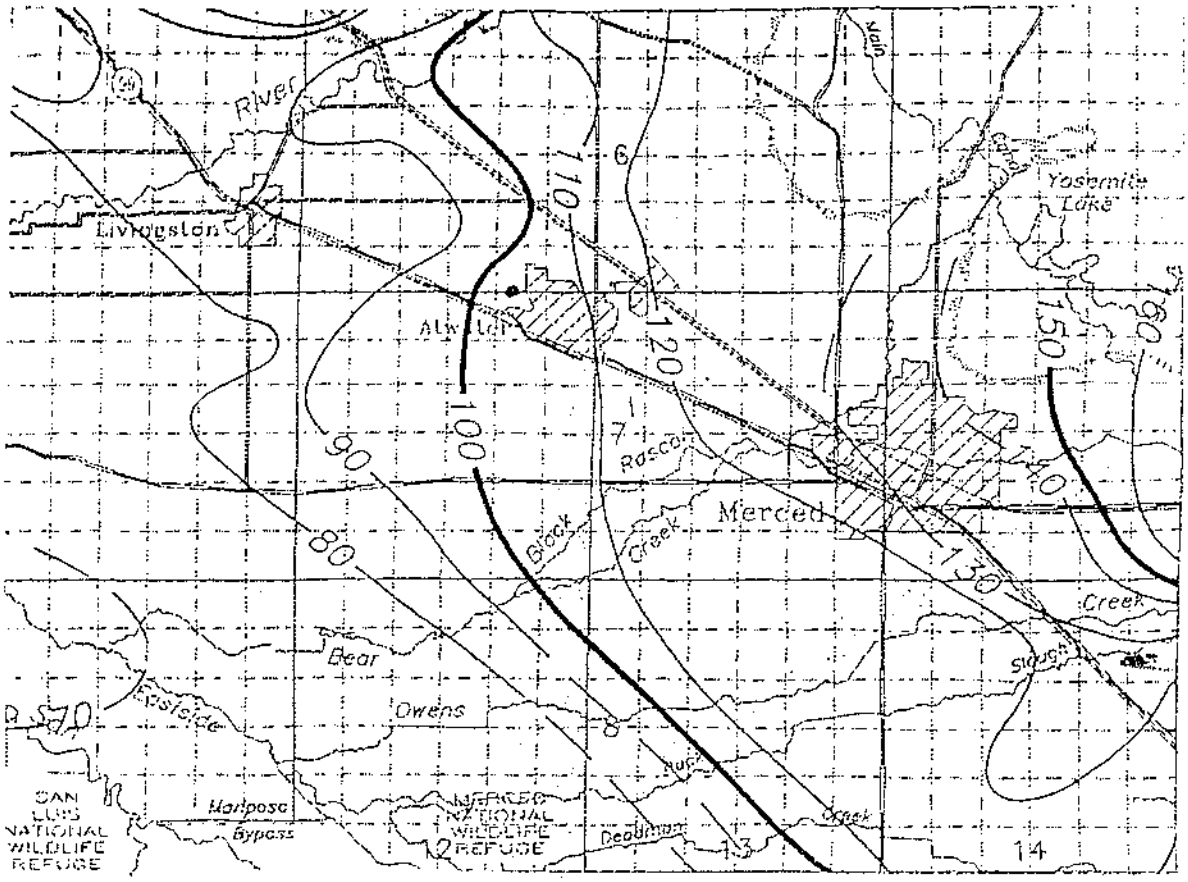


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1990

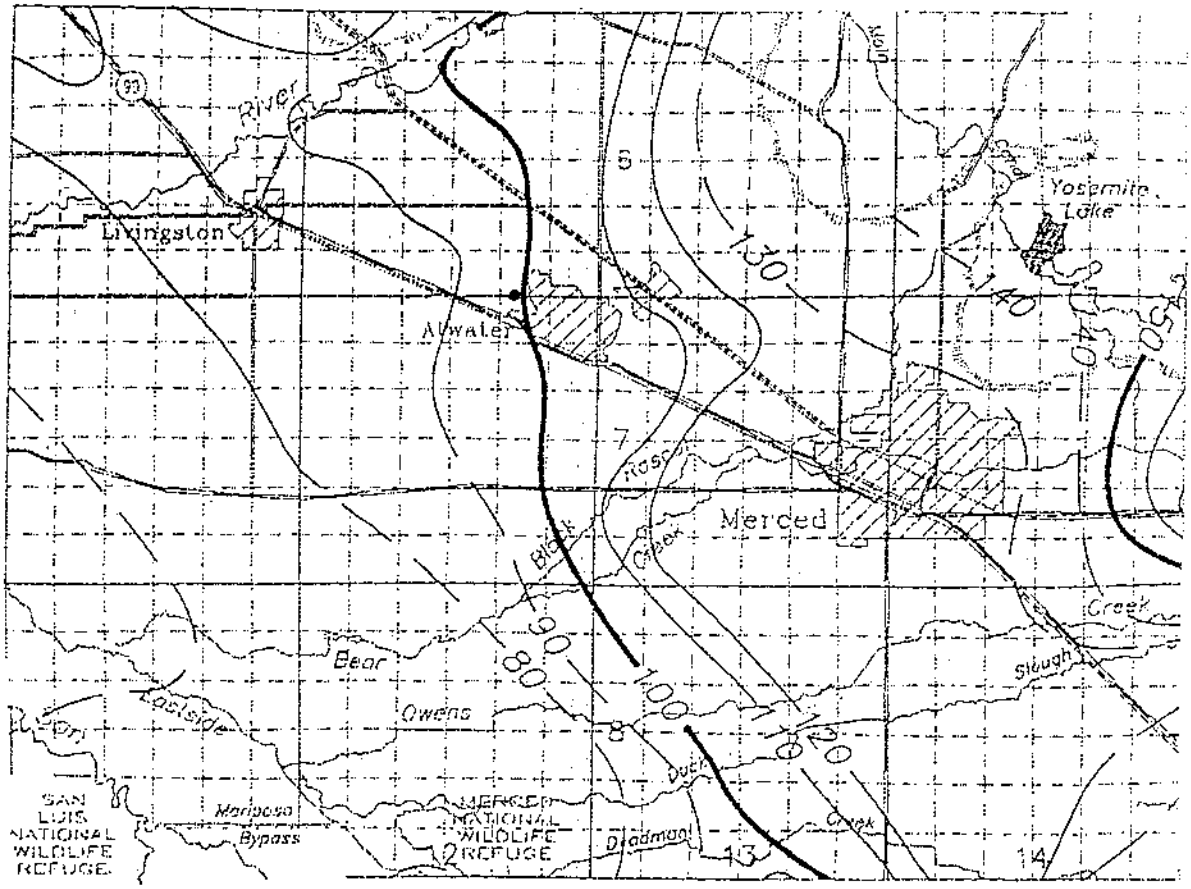


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1991

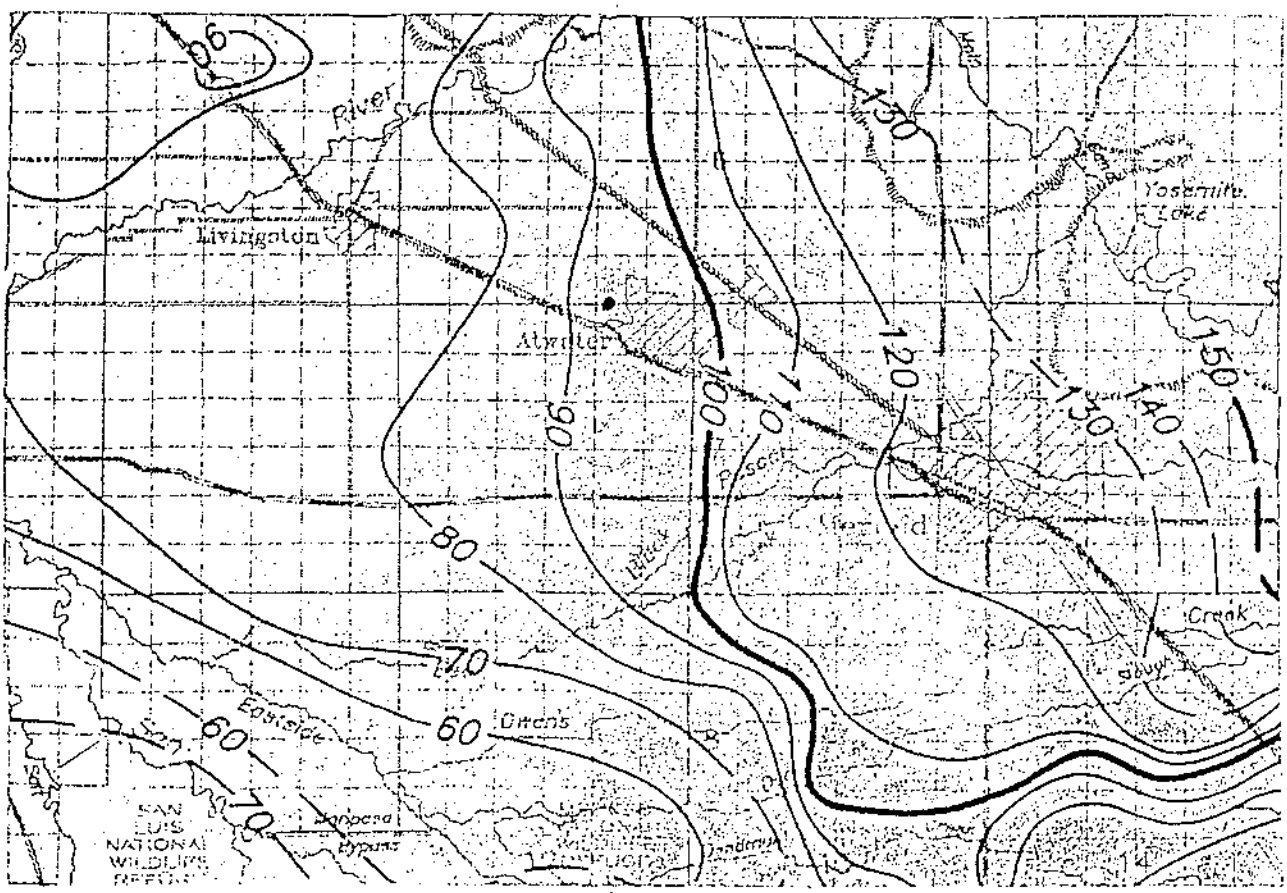


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1992

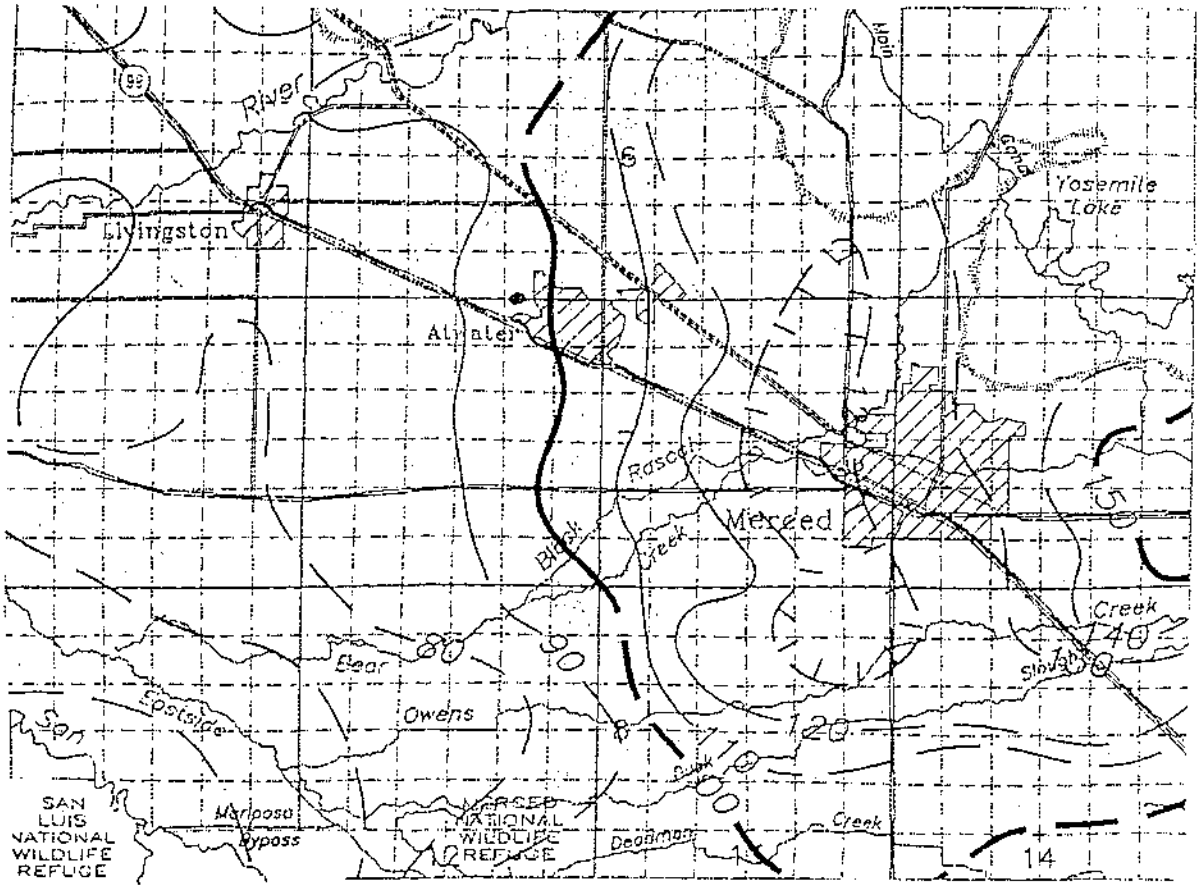


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1993

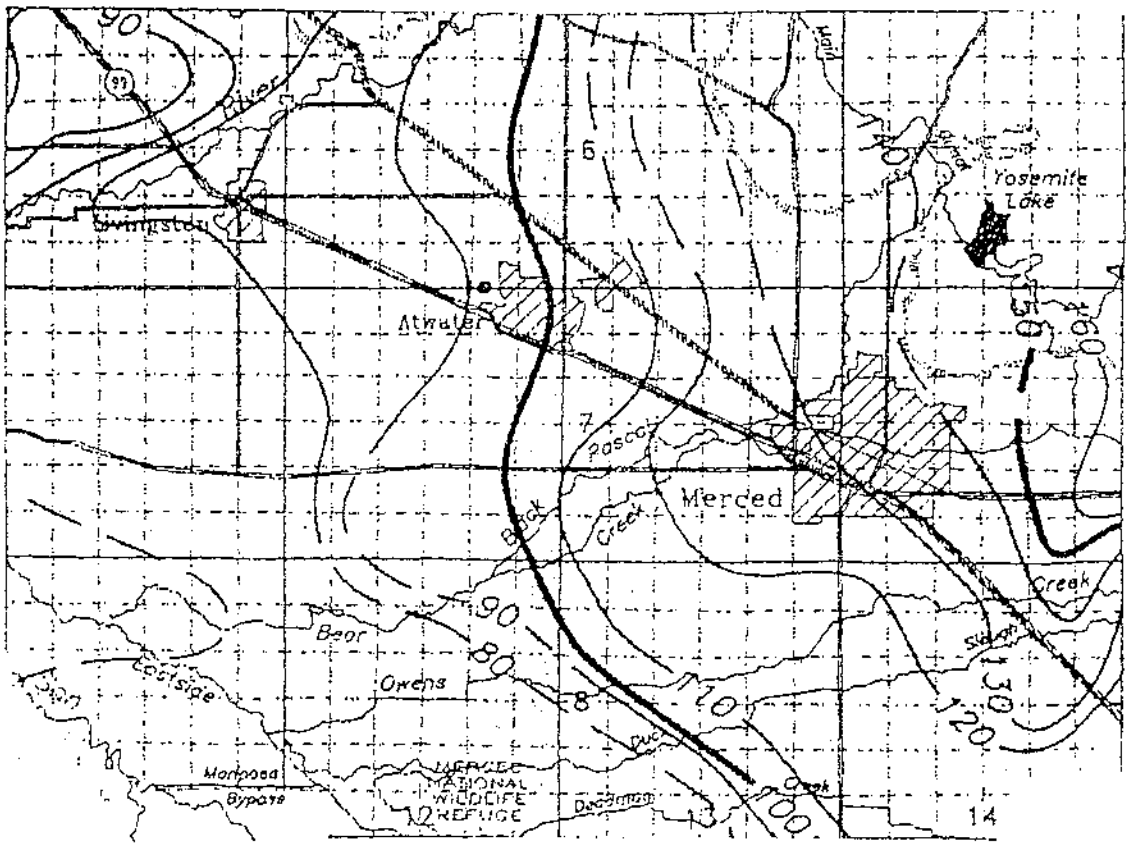


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1994

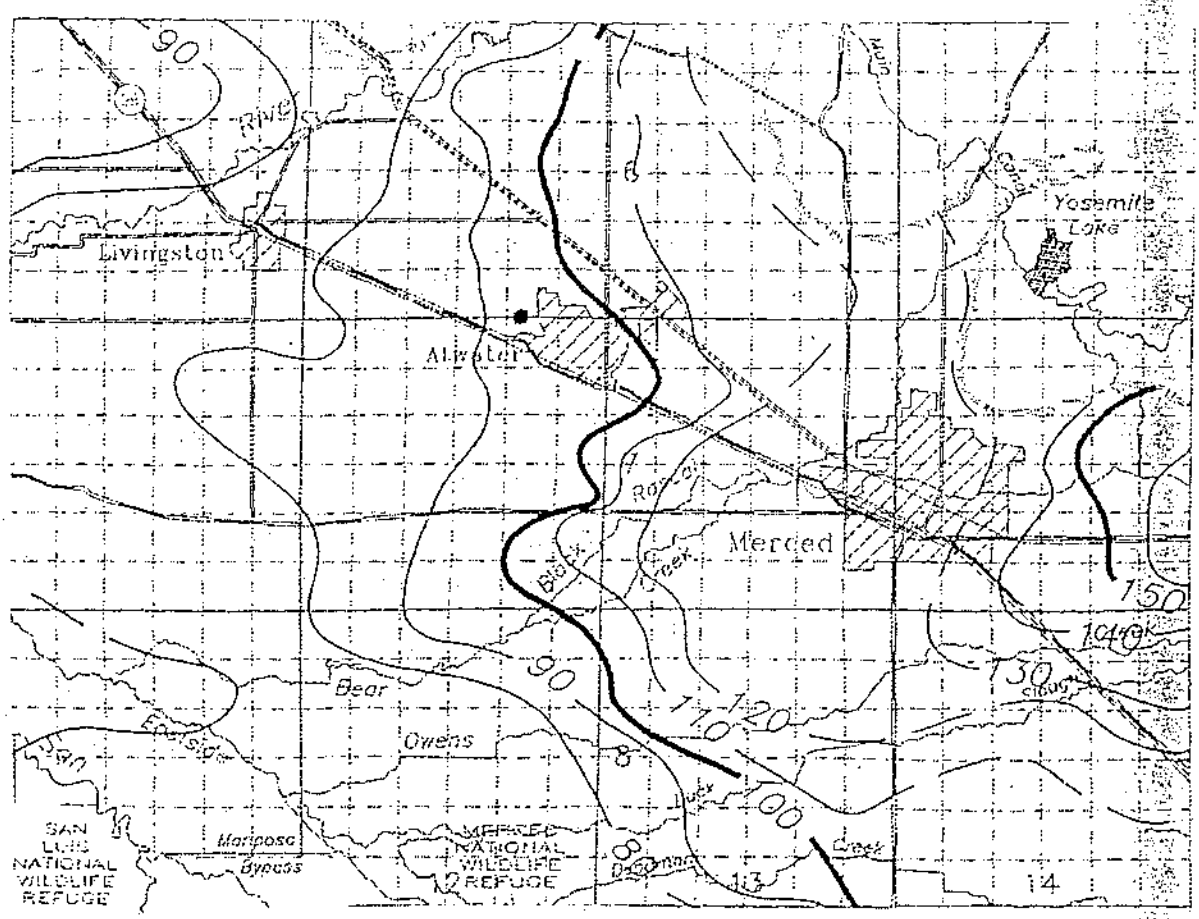


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1995



LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1996

APPENDIX B

J. R. Wood, Inc., Well Logs

Copy

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 082633

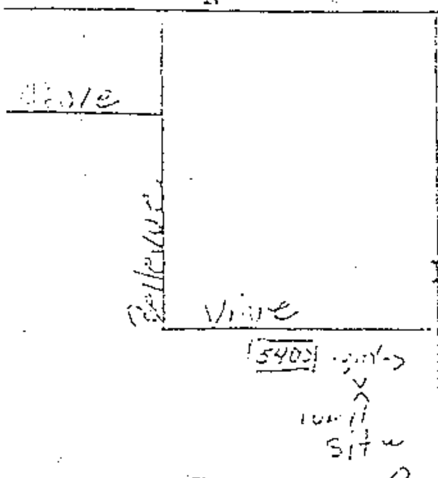
State Well No.
Other Well No.

Intent No.
Permit No. or Date

(1) OWNER: Name WOOD FRUIT CO.
791 W. BELLEVUE P.O. BOX 545
ATWATER, CALIF. Zip 95301

(2) LOCATION OF WELL (See instructions): MERCED Owner's Well Number #8 GRAPES
Address if different from above
Township Range Section
Distance from cities, roads, railroads, fences, etc. 300 FT. EAST OF NORTH VINE, ATWATER

N



S

WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

☒ (4) PROPOSED USE:
Domestic ☐
Irrigation ☒
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) EQUIPMENT:
Rotary ☐ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☐ No ☒ Size
Diameter of bore
Packed from ft. to ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☐ Concrete ☐

(8) PERFORATIONS: NONE
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
	148	14	10	-0-	-0-	-0-

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☐ No ☒ If yes, to depth ft.
Were strata sealed against pollution? Yes ☐ No ☒ Interval ft.
Method of sealing

(10) WATER LEVELS:
Depth of first water, if known 47 ft.
Standing level after well completion ft.

(11) WELL TESTS:
Was well test made? Yes ☐ No ☒ If yes, by whom?
Type of test Pump ☐ Bailer ☐ Air lift ☐
Depth to water at start of test ft. At end of test ft.
Discharge gal/min after hours Water temperature
Chemical analysis made? Yes ☐ No ☒ If yes, by whom?
Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 210 ft. Depth of completed well 210 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	8	SANDY SOIL
8	14	COARSE BROWN SAND
14	17	SANDY BROWN CLAY
17	28	BROWN SAND
28	41	FINE BROWN SAND & GRAVEL
41	52	COARSE GREY SAND
52	67	SILT W/LAYERS OF GREY CLAY
67	81	COARSE GREY SAND
81	88	SILT & GREY SAND
88	102	COARSE GREY SAND
102	107	GREY CLAY
107	121	SANDY BROWN CLAY
121	132	GREY PACKED SAND
132	143	SILTY BROWN CLAY & BROWN SAND.
143	159	GREY CLAY
159	172	SANDY BROWN CLAY
172	176	SOFT GREY CLAY
176	203	BROWN CLAY
203	210	COARSE BROWN SAND & GRAVEL
210		RED CLAY

#8 Grape Well

Received by OMRI
MAR 15 2001

Work started 6-29 1983 Completed 7-3 1983

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED STAN HARDIN
(Well Driller)

NAME HARDIN WELL DRILLING
(Person, firm, or corporation) (Typed or printed)
Address 8760 EAST VOORHEES RD.
City LE GRAND, CALIF Zip 95333
License No. # 419571 Date of this report 7-5-83

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do Not Fill In

No. 145756

State Well No. _____

Other Well No. _____

WNER:

Woods Fruit Company
s 7916 West Bellevue Rd.
Atwater, California 95301

OCATION OF WELL:

Merced Owner's number, if any
, Range, and Section T 6 S R 12 E S 35
From cities, roads, railroads, etc. 150' East of Vine
50' South of Bellevue Road

YPE OF WORK (check):

ell ☒ Deepening ☐ Reconditioning ☐ Destroying ☐
uctions, describe material and procedure in Item 11.

ROPOSED USE (check):

estic ☐ Industrial ☐ Municipal ☐
tion ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐
Cable ☒
Other ☐

ASING INSTALLED:

STEEL: OTHER:
E ☒ DOUBLE ☐

If gravel packed

n	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
)	168	14	10			

ave or weld on Ex. heavy Band
e of shoe Buttweld

PERFORATIONS OR SCREEN:

Perforations or name of screen None

rom ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.

CONSTRUCTION:

rface sanitary seal provided? Yes ☐ No ☒ To what depth ft.
ous strata sealed against pollution? Yes ☐ No ☒ If yes, note depth of strata
ft. to ft.
ft. to ft.
d of sealing

WATER LEVELS:

t. at which water was first found, if known ft.
ter level before perforations, if known 54 ft.
ter level after test, pump, and development ft.

) WELL TESTS:

mp test made? Yes ☒ No ☐ If yes, by whom Anderson Pump
2800 gal. per Seven 27 ft. drawdown after hrs.
rculated? Yes ☐ No ☒
ter clear and free of sand? Yes ☐ No ☒ If no, reason why

(11) WELL LOG:

Total depth 192 ft. Depth of completed well 187 ft.

Formations: Describe by color, character, size of material, and structure

0'	to 7	ft. to	Atwater sand ft.
7	9		Hard pan
9	18		Brown sand & silt
18	34		White sand
34	48		Red sandy clay
48	61		Grey clay
61	100		Fine brown sand
100	104		Grey clay
104	106		Grey sand
106	112		Brown sandy clay
112	119		Brown sand & silt
119	133		Brown sandy clay
133	139		Fine brown sand
139	148		Medium brown sand
148	160		Grey packed sand
160	164		Coarse grey sand
164	172		Grey clay
172	186		Sandy brown clay
186	192		Coarse grey sand

Received by OMRI
MAR 15 2001

Work started 7--28 19 76 Completed 7--31 19 76

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Everett A Loewenstein
Person, firm, or corporation (Type or print)

Address 1408 Cameron Lane
Merced, California 95340

[SIGNED] Everett A Loewenstein
Well Driller

License No. 254339 Dated August 19 1976

SKETCH LOCATION OF WELL ON REVERSE SIDE

APPENDIX C

DWR Water Year Index Data

Chronological Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices

Based on unimpaired runoff in [million acre-feet] which is subject to revision. Indices in italics are estimates. 7/3/97

	Sacramento Valley					San Joaquin Valley					Eight River Index				
	River Runoff [maf]			WY Index		River Runoff [maf]			WY Index		River Runoff [maf]				
WY	Oct-Mar	Apr-Jul	WY	Index	Yr type	Oct-Mar	Apr-Jul	WY	Index	Yr type	Jan	Feb	Mar	Apr	May
1951	16.77	5.42	22.95	9.18	AN	4.35	2.83	7.25	3.14	AN	3.40	3.52	2.66	2.81	3.15
1952	13.86	13.68	28.60	12.38	W	2.18	6.84	9.30	5.17	W	3.48	4.03	3.68	6.35	7.51
1953	10.83	8.26	20.09	9.55	W	1.07	3.16	4.35	3.03	BN	5.40	1.52	2.06	3.25	3.38
1954	9.74	6.81	17.43	8.51	AN	1.10	3.16	4.30	2.72	BN	2.20	2.84	3.66	4.56	3.27
1955	5.19	5.07	10.98	6.14	D	0.76	2.67	3.50	2.30	D	1.16	0.96	1.27	1.97	3.22
1956	20.32	8.60	29.89	11.38	W	4.14	5.29	9.67	4.46	W	7.52	3.71	3.07	3.51	5.24
1957	7.72	6.29	14.89	7.83	AN	1.02	3.19	4.29	3.01	BN	0.79	2.65	3.41	2.36	3.85
1958	16.37	12.24	29.71	12.16	W	1.67	6.40	8.36	4.77	W	2.39	7.61	4.71	6.04	6.74
1959	7.40	3.84	12.05	6.75	BN	0.98	1.85	2.98	2.21	D	2.25	2.50	1.98	2.27	1.82
1960	7.72	4.65	13.06	6.20	D	0.85	2.07	2.96	1.85	C	0.90	3.15	3.22	2.50	2.39
1961	6.87	4.39	11.97	5.68	D	0.54	1.50	2.10	1.38	C	0.86	2.14	1.93	2.02	2.16
1962	8.17	6.23	15.11	6.65	BN	1.26	4.24	5.61	3.07	BN	0.78	4.08	2.39	3.89	3.14
1963	12.01	10.09	22.99	9.63	W	1.68	4.37	6.24	3.57	AN	1.70	4.66	2.10	5.60	4.99
1964	5.90	4.37	10.92	6.41	D	0.93	2.14	3.14	2.19	D	1.55	1.01	1.15	1.92	2.44
1965	16.59	8.13	25.64	10.15	W	3.23	4.55	8.15	3.81	W	5.61	2.26	1.97	4.74	3.81
1966	7.42	4.84	12.95	7.16	BN	1.49	2.42	3.98	2.51	BN	1.85	1.56	2.52	3.33	2.52
1967	12.14	11.01	24.06	10.20	W	2.46	7.09	9.98	5.25	W	3.34	2.52	4.09	3.82	6.26
1968	8.66	4.12	13.64	7.24	BN	1.02	1.85	2.94	2.21	D	1.49	3.71	2.55	2.17	2.15
1969	15.33	10.68	26.98	11.05	W	3.84	8.14	12.29	6.09	W	7.91	4.73	3.36	5.44	7.34
1970	18.87	4.35	24.06	10.40	W	2.55	2.96	5.61	3.18	AN	10.68	3.02	3.12	1.82	2.77
1971	12.71	8.90	22.57	10.37	W	1.56	3.23	4.91	2.89	BN	3.05	1.83	3.73	3.40	4.18
1972	7.61	5.02	13.43	7.29	BN	1.25	2.22	3.57	2.16	D	1.40	1.73	3.30	2.52	2.61
1973	12.80	6.38	20.05	8.58	AN	1.87	4.48	6.47	3.50	AN	4.08	3.66	3.27	3.08	4.76
1974	21.69	9.78	32.50	12.99	W	2.43	4.53	7.12	3.90	W	6.93	2.10	6.18	5.07	4.69
1975	9.24	8.95	19.23	9.35	W	1.37	4.65	6.18	3.85	W	1.01	2.92	4.65	2.89	5.40
1976	4.63	2.75	8.22	5.29	C	0.78	1.07	1.97	1.57	C	0.65	0.88	1.34	1.35	1.44
1977	2.49	1.93	5.12	3.11	C	0.22	0.80	1.05	0.84	C	0.47	0.48	0.54	0.69	0.91
1978	14.90	8.12	23.92	8.65	AN	2.57	6.50	9.65	4.58	W	5.91	3.48	5.36	4.40	4.70
1979	6.06	5.64	12.41	6.67	BN	1.87	3.99	5.98	3.67	AN	1.44	2.10	2.90	2.67	4.50
1980	15.49	6.00	22.33	9.04	AN	3.74	5.41	9.47	4.73	W	6.89	5.93	3.62	3.11	3.67
1981	6.81	3.63	11.10	6.21	D	0.85	2.29	3.22	2.44	D	1.57	1.76	2.48	2.32	2.11
1982	20.56	11.73	33.32	12.72	W	3.78	7.00	11.41	5.45	W	3.50	5.57	4.74	8.05	5.68
1983	22.75	13.66	37.65	15.29	W	5.42	8.73	15.01	7.22	W	4.25	6.46	10.57	4.87	6.96
1984	15.98	5.52	22.35	10.00	W	3.51	3.48	7.13	3.69	AN	2.85	2.29	3.08	2.50	3.60
1985	6.24	4.00	11.04	6.47	D	1.11	2.41	3.60	2.40	D	0.84	1.21	1.59	2.79	2.14
1986	19.44	5.37	25.72	9.93	W	4.36	4.92	9.50	4.31	W	2.62	11.55	7.09	3.19	3.56
1987	5.82	2.77	9.20	5.83	D	0.55	1.48	2.08	1.86	C	0.78	1.51	2.54	1.73	1.47
1988	5.77	2.89	9.19	4.63	C	0.86	1.55	2.48	1.48	C	1.83	1.01	1.26	1.48	1.58
1989	9.00	5.10	14.80	6.13	D	1.07	2.42	3.56	1.96	C	0.85	0.99	6.14	3.58	2.21
1990	4.94	3.73	9.23	4.81	C	0.83	1.59	2.46	1.51	C	1.27	0.88	1.83	1.80	1.77
1991	3.92	4.00	8.45	4.22	C	0.56	2.57	3.20	1.96	C	0.37	0.45	2.64	1.95	2.40
1992	5.49	2.91	8.92	4.08	C	0.86	1.66	2.58	1.56	C	0.58	2.41	1.99	2.17	1.33
1993	12.43	8.96	22.17	8.54	AN	2.49	5.65	8.38	4.20	W	4.06	3.12	5.70	4.33	5.23
1994	4.54	2.71	7.77	5.01	C	0.66	1.80	2.54	2.05	C	0.78	1.23	1.48	1.56	1.79
1995	19.41	13.41	33.90	12.69	W	3.67	8.02	12.35	5.96	W	8.02	3.06	9.95	5.58	7.09
1996	13.00	8.34	22.20	10.24	W	2.56	4.50	7.18	4.11	W	2.42	6.22	4.24	3.98	5.43
1997	20.29	9.25		10.81	W	5.75	3.61		4.14	W	12.12	2.76	2.50		
1998															
1999															
2000															

J·R·WOOD INC.

Org 3

Received by OMRI
MAR 15 2001

Date: July 16, 1997

To: George Kalogridis
Ojai Organics

From: Ron O'Bara
J.R. Wood, Inc.

George,

Attached are the J.R. Wood lab results for the Organic Peach peeling experiment conducted on Friday, July 11, 1997.

Summary of Experiment

John Pryor a certified Organic peach grower sold J.R. Wood, Inc. several tons of Organic Loadel Cling peaches. Certification and weight tags attached. J.R. Wood invited Rod Crossley of the NOSB to be present for the experiment. J.R. Wood had a USDA representative on site to officially draw the samples. USDA letter attached.

At shift start (7:00am) we dumped two organic bins onto the processing line. The USDA rep pulled the samples of raw peaches from the inspection line just after the rinse tank. No other peaches were dumped for five minutes to create a controlled gap.

The USDA rep went inside the processing plant to the trim line and waited for the organic peaches to go through the potassium process, Magnusson scrubber, sizer, pitter and the trim line. The USDA rep pulled samples from the trim line and then went to the next station. The peaches went through slicers and then a water blancher. More samples were collected after the blancher. The peaches went into a chill tank with Ascorbic acid and then into an IQF tunnel. The last sample was pulled after the peach was frozen.

The samples were taken to the J.R. Wood Analytical Lab where they were prepared for analysis. Rod Crossley suggested we repeat the process several hours into the shift to determine if any residue was building up in the plant. The experiment was repeated at 10:45am. This period was selected because it was 15 minutes prior to lunch break and the plant does some limited sanitizing and rinsing during lunch break. If there was any residue it should peak at this period.

The analytical lab prepared samples for in house testing and sent for an independent lab to confirm results. The in house results were fairly predictable. Sample 1 (the raw organic peach) had the highest potassium content. This is the naturally occurring potassium in the peach. After peeling the peaches with a potassium hydroxide solution the peaches actually had a lower potassium level. This indicated that there was no uptake of potassium hydroxide and that some of the naturally occurring potassium was removed with the peel. I will forward the independent results when they are available. Hopefully Friday or Monday.

7916 WEST BELLEVUE ROAD • P.O. BOX 545 • ATWATER, CALIFORNIA 95301 • 209-358-5643
FAX: ADMINISTRATION 209-358-4197 FAX: PURCHASING 209-358-8497 FAX: TRAFFIC 209-358-3266

It appears we have a processing aid scenario similar to the pretzel exemption for potassium hydroxide . Remember we are talking about IQF and solid pack organic sliced and diced peaches only.

Feel free to share this information with whom you think is necessary.

Sincerely,

Ron O'Bara

d States
rtment of
culture

Marketing and
Regulatory
Programs

Agricultural
Marketing
Service

Fruit & Veg. Div.
Processed Prod. Br.
2202 Monterey St.
Suite 102-A
Fresno, CA
93721-3175

J.R. Wood, Inc.
7916 Belleview Rd
Atwater, CA

July 15, 1997

On July 11, 1997 the USDA drew eight samples at J.R. Wood, Inc.

At 7:05 AM 2 bins marked "John Pryor Organic Loaded 07-05-97 #489240" were dumped into the line. Four samples were drawn as follows:

Day Code 2192701

Sample 1	(Fresh Peaches)	10 pounds taken after dump tank
Sample 2	(Halves)	10 pounds taken after trim line
Sample 3	(Slices)	10 pounds taken after blanchers
Sample 4	(IQF)	20 pounds finished product

At 10:45 4 bins, each with separate markings, were dumped into the line. The bins were marked -

Bin 1 - "Yagi Carson Cling 07-10-97 #489378"
Bin 2 - "Nakashima Carson Cling 07-10-97 #489380"
Bin 3 - "John Pryor Organic Loaded 07-05-97 #489240"
Bin 4 - "Dairy Block 48 Stanislaus Cling 07-10-97 #489361"

Four Samples were drawn as follows:

Day Code 2192704

Sample 1	(Fresh Peaches)	10 pounds taken after dump tank
Sample 2	(Halves)	10 pounds taken after trim line
Sample 3	(Slices)	10 pounds taken after blanchers
Sample 4	(IQF)	20 pounds finished product

Samples were labeled and taken to research lab at the plant. The inspector watched the samples divided and a portion of each sample labeled and packaged for shipment to a private lab.

Tony Giannetta
Area Supervisor

CC: Y. Kagawa
R. Villaluz

DEPARTMENT OF HEALTH SERVICES
2151 BERKELEY WAY
BERKELEY, CA 94704-1011
(510)540-2800

April 10, 1996

Dajing Ji
J. R. Wood, Inc.
Pesticide Laboratory
P.O. Box 545
Atwater, CA 95301

Certificate No.: 1673

Dear Mr. Ji:

This is to advise you that the laboratory named above has been certified as an environmental testing laboratory pursuant to the provisions of the California Environmental Laboratory Improvement Act of 1988 (Health and Safety Code, Division 1, Part 2, Chapter 7.5, commencing with Section 1010).

The fields of testing for which this laboratory has been certified under this Act are indicated in the enclosed "List of Approved Fields of Testing and Analytes." Certification shall remain in effect until November 30, 1997 unless revoked. This certificate is subject to an annual fee as prescribed by Section 1017(a), Health and Safety Code, on the anniversary date of the certificate.

Please note that your laboratory is required to notify the Environmental Laboratory Accreditation Program of any major changes in the laboratory such as the transfer of ownership, change of laboratory director, change in location, or structural alterations which may affect adversely the quality of analyses (Section 1014(b), California Health & Safety Code).

Please note that the new regulations pertaining to environmental laboratories were adopted on December 5, 1994 and may be found in the California Code of Regulations, Title 22, Division 4, Chapter 19, Sections 64801 through 64827.

Your continued cooperation is essential in order to establish a reputation for the high quality of the data produced by environmental laboratories certified by the State of California.

If you have additional questions, please contact Amanda Vidal at (510) 540-2800.

Sincerely,

George C. Kulasingam

George C. Kulasingam, Ph.D., Manager
Environmental Laboratory
Accreditation Program

Enclosure

Oregon Tilth Certified Organic

11535 S.W. Durham Road, Suite C-1, Tigard, Oregon 97224
Voice (503) 620-2829, Fax (503) 624-1386

Certification Acknowledgement

This is to certify that

J.R. WOOD, INC.
7916 West Bellevue Road, Atwater, California 95301

has been certified organic by the Oregon Tilth Certification Program,

CLASS OP
Organic Food Processor/ Co-Packer

Certification Number CA-OTCO-CO-93-00023

J. R. Wood, Inc. has complied with the above Standards and Guidelines Class OP. The following organic product or products processed & sold during the stated year are:

Apples, Apple Juice, Apricots, Bananas, Blueberries, Broccoli, Carrots, Cauliflower, Celery, Corn, Grapes, Grape Juice, Green Beans, Nectarines, Oat Flour, Parsnips, Pasta, Peaches, Pears, Peas, Plums, Potatoes, Prunes, Rice Flour, Spinach, Squash, Strawberries, Sweet Potatoes, Turnips, Zucchini.

This plant has been inspected during the production year by an agent of the OTCO program to verify that to the best of our knowledge the standards and guidelines have been met.

Issued: January 4, 1997
Expires: January 3, 1998

Yvonne Frost
Certification Director

CALIFORNIA CERTIFIED ORGANIC FARMERS

hereby certifies that

MALLARD BEND FARMS
1581 Laurel Ave.
Atwater, CA 95301
managed by
Alan, Daniel, & John Pryor

meets the standards established for
ORGANICALLY GROWN
by CCOF and the provisions of the CALIFORNIA ORGANIC FOOD ACT OF 1990, during the period
April 1, 1997 - April 30, 1998
for the following operations:

1 Location: **7420 N. Central Ave, Winton, Northwest parcel**
Certified Since: **12/10/92** Acres: 9
1997 Crops: **peaches**

2 Location: **7420 N. Central Ave, Winton; Northeast & parcel**
Certified Since: **12/10/92** Acres: 7
1997 Crops: **fallow**

3 Location: **7420 Central, Winton, southwest parcel**
Certified Since: **7/27/95** Acres: 7
1997 Crops: **almonds**

Date Issued: 5/1/97

CERTIFICATION PROGRAM COORDINATOR

Certificate Number
bv041

CERTIFICATION STANDARDS COMMITTEE CHAIR

Certified California Organic CCOF Farmers TM

Standards and documentation available from the CCOF Statewide Office:
1115 Mission St. Santa Cruz CA 95060 (408) 423-2263

RECEIVING STATION COPY

WEIGHMASTER CERTIFICATE

THIS IS TO CERTIFY that the following described commodity was weighed, measured, or counted by a weighmaster, whose signature is on this certificate, who is a recognized authority of accuracy, as prescribed by Chapter 7 (commencing with Section 12700) of Division 5 of the California Business and Professions Code, administered by the Division of Measurement Standards of the California Department of Food and Agriculture.

WEIGHED AT:

☒ **J.R. WOOD, INC.** P.O. BOX 545 • 7916 W. BELLEVUE ROAD ATWATER, CA 95301 • PHONE (209) 358-5643

☐ P.O. BOX 850 • 1117-K STREET • SANGER, CA 93657 • PHONE (209) 875-3354

☐ _____

Received by OMRI MAR 15 2001

RECEIVED FROM (GROWER) John Pryor DATE 7-5-01

ADDRESS

PRODUCT Organic Lodel HAULER TIME

DELIVER TO Munoz Inc

VEH. LIC.	TRAILER LIC.	TRAILER LIC.	DRIVER
4L82112			John

	TOTAL FULL BINS	WT. IN LBS.		TOTAL LBS. CONTAINER TARE WEIGHT
BINS	8 CT 131	JRW B1	=	1048
BINS	CT	JRW B2	=	
BINS	CT	JRW B3	=	
BINS	CT	JRW B4	=	
PALLETS	CT CODE		=	
BOXES	CT CODE		=	
NO. EMPTY BINS		BOX PALLET-BIN TOTAL TARE		1048

J.R. Wood, Inc.
WEIGHMASTER

WT. IN LBS.	
GROSS WEIGHT	15140
by _____ DEPUTY	
VEHICLE TARE	5400
by _____ DEPUTY	
TOTAL WEIGHT FRUIT & CONTAINERS	9740
BOX-PALLET-BIN TOTAL TARE	1048
TOTAL WEIGHT OF FRUIT	8692
DOCKAGE	—
NET PAY WEIGHT OF FRUIT	8692

SAMPLE SIZE SAMPLE POUNDS GRADED 50

OFF GRADE

	POUNDS	PERCENT
1 DECAY & WORMS	1 1/2	3
2 CULLS GENERAL		
3 GREEN		
4 OVER RIPE		
5 SMALL		
6 OTHER (SPECIFY)		
TOTAL		3

PERCENT OF DOCKAGE —

GROWER NO. _____

VARIETY NO. _____

PRICE CODE 1

PRODUCE RECEIVING AND GRADING REPORT

TICKET NUMBER 489240

J·R·WOOD INC.
P.O. Box 545, Atwater, CA 95301. 209 358-5643

J.R. WOOD LABORATORY JULY 16,1997
CERTIFICATE OF ANALYSIS

Sample Description: PEACHES

Date : 7-11-97

Lot No: na
Code: na TIME: 7:05 AM
Sample Description: ORGANIC FRESH PEACHES

	POTASSIUM LEVEL
WHOLE, RAW UN-PEELED	1053.0 ppm
PEELED HALVES TRIM LINE	891.0 ppm
SLICED, BLANCH	630.0 ppm
FINISHED IQF PEACHES	628.0 ppm

Sample Description: NON ORGANIC FRESH PEACHES

Lot No: na
Code: na

WHOLE, RAW UN-PEELED	1167.0 ppm
PEELED HALVES TRIM LINE	985.0 ppm
SLICED, BLANCHED	1153.0 ppm
FINISHED IQF PEACHES	1110.0 ppm

Tested Method: AOAC(14th edition) 22.031
Perkin-Elmer ANALYSIS OF FOODSTUFFS (FP-1)

Signature Lab Manager: 7-16-97

J.R. WOOD INCORPORATED
P.O. Box 545
Atwater, CA 95301

FAX COVER SHEET

DATE:	June 26, 1997	TIME:	2:30 PM
TO:	Yvonne Frost Oregon Tilth	PHONE: FAX:	(503) 620-2829 (503) 624-1386
FROM:	Danny Galatro DG J.R. Wood, Inc.	PHONE: FAX:	(209) 358-5643 x227 (209) 358-9701
RE:	Organic IQF Peaches		
CC:			

Number of pages including cover sheet: 7

Message Research 1994 - 1997

1) Steam Peeling

In August of 1989, J.R. Wood used an atmospheric steam cooker / peeler on conventional peaches, in an effort to peel without the lye solution. J.R. Wood uses the steam peeler for vegetables such as carrots and potatoes. The peaches were washed and sorted as usual. Peaches by-passed the lye tank and were diverted in batches into a batch cooker. The batch cooker uses steam under pressure to heat the exterior of the product. J.R. Wood adjusted the dwell time from 30 seconds to 60 seconds, to 75 seconds and finally 90 seconds. After cooking for the designated period, the peaches were emptied onto the screw conveyor which feeds a Magnusson scrubber. The Magnusson scrubber removes the peel using fresh water and bristle brushes.

Results:

30 seconds	Peel still on 75%
60 seconds	Some peel still on 35%
75 seconds	Some peel still on, flesh significantly damaged
90 seconds	Little peel evident, much flesh destroyed

After 75 seconds, the peaches weighed approximately 60% of their starting weight. This weight still included the pit. Normally, IQF peaches weigh 65% of starting weight, after peeling and pitting.

Experiment was halted due to poor recovery and excessive damage to flesh. Note there was some peel remaining at 90 seconds. Bristle brushes cause too much damage to flesh while removing skin. Skin does not come readily free until peach is well cooked. Over cooking may contribute to flesh damage.

2) Steam Peeling II

In the summer of 1990, J.R. Wood conducted another steam peeling experiment using different brushes in a different Magnusson scrubber. These brushes are much finer and are the usual brushes used to peel lye treated peaches. The experiment was conducted with conventional peaches. The peaches were sorted and washed in the usual manner. Peaches were collected in batches and put into the batch steam peeler. Dwell time started at 60 seconds with progression up to 120 seconds. Peaches were collected in buckets as they emerged from steam peeler. Buckets were hand carried to the Magnusson scrubber (with fine brushes). Peaches were dumped into Magnusson scubber.

Results:

60 seconds	Peel still on Peach
75 seconds	Peel still on Peach
90 seconds	Peel still on Peach
	Peach becoming soft
120 + seconds	Peel coming off 55%
	Peach becoming soft and dripping

Experiment halted due to texture breakdown. The fine brushes were unable to remove peel until peach was extremely over cooked.

3) Slip Skinning

In the summer of 1991, an organic yogurt company from Europe began working with an organic peach grower George Noroian of Dinuba, CA. The yogurt company wanted an IQF 3/8" diced organic peach for use in it's yogurt. George Noroian operates a small scale canning operation, in addition to growing organic peaches. Noroian uses an old hand peeling method known as slip skinning. Noroian grows two old varieties of peaches (White Nectar and the regular Elberta) that work especially well with slip skinning. The slip skinning process works as follows:

Peaches are left on trees until overripe (by freezing standards). Peaches are picked in small picking boxes (30 lbs. each), instead of normal fruit bins which hold 1,000 lbs. Small boxes are used because the overripe peaches will bruise and crush in larger quantities. Boxes are taken to cannery, which is located at the edge of the orchard. Boxes of peaches are dumped on a conveyor. Peaches travel on a conveyor to a cutting and pitting station. Workers pick up each peach, cut it in half and scoop out pit and pit fragments. The halves are placed with pit cavity down on a conveyor. The conveyor passes the peaches through a small steam tunnel. The steam tunnel cooks the skin with live steam. When the peaches emerge from the tunnel, workers wearing gloves pinch a portion of the skin and pull it away from the flesh. In most cases, the entire peel comes off. Peaches with some peel remaining, are hand peeled with a small knife.

This process works best with older varieties of peaches, when they have matured to overripe.

In July of 1991, George Noroian ran Elberta peaches through the slip skinning process at his cannery in Dinuba. The peeled halves were collected in plastic buckets with a chilled Vitamin C and water solution. The Vitamin C solution was used to prevent oxidizing until the peaches could be transported to the J.R. Wood plant. The peaches were transported in a refrigerated van to the J.R. Wood plant. The peach halves were dumped on a de-watering conveyor and fed to an urschell dicer. The dicer was set to make 3/8" dices. The diced peaches went into a soak tank for chilling and further Vitamin C treatment. The peaches emerged from the soak tank on a stainless steel chain conveyor and passed under knife blowers. The knife blowers force high volumes of air across the peaches removing excess moisture. The diced peaches then enter an IQF tunnel for freezing.

Results:

Stage I (dicer)	Peaches too ripe
	Irregular dicing, shredded peaches
Stage II (IQF Tunnel)	Peaches too ripe, dices froze together in single mass in tunnel

Experiment halted to prevent damage to IQF equipment. no diced peaches were produced that met USDA IQF Standards.

Experiment conclusion: In order for slip skinning to work raw peaches must be overripe (by freezer standards). Unfortunately, overripe peaches break down in dicing and slicing equipment. Overripe peaches have flesh that is too moist and stringy. This flesh condition prevents dicers from making uniform cuts. It also makes freezing pieces individually in a tunnel impossible.

After this experiment, J.R. Wood began searching for alternative equipment at various dealers and shows. As of February 1997, J.R. Wood has not found any potential processing equipment that may peel peaches without lye.

In 1995, J.R. Wood was contacted by the USDA regarding an ingredient list and processing aid list compiled by the NOSB, for submission to USDA. Ted Rodgers, of the USDA, was briefed about the peeling problem with peaches. J.R. Wood was advised that it was too late to add Potassium Hydroxide to the initial processing aid list. Mr. Rodgers expressed the opinion that if an industry leader such as J.R. Wood could not find an alternative means of peeling peaches, then the USDA would probably look very favorably upon including Potassium Hydroxide as a processing aid in the future.

In the summer of 1995, J.R. Wood conducted some tests to further bolster the prospects for including Potassium Hydroxide as a processing aid. Conventional peaches were gathered from the processing line prior to the lye tank. Peaches were ground up in a blender. A solution was prepared and the peaches were tested for N, P and K content. Specifically the Potassium content was recorded and this value was used as a control sample.

Conventional peaches were then gathered after the Potassium Hydroxide treatment and Magnusson scubber. The peeled peaches were ground up in a blender and a solution was prepared for testing. The Potassium content was recorded and compared to the control.

Results:

Potassium levels were identical in control sample and peeled peaches.

Conclusion: Test results would indicate that peeled peaches did not contain any residual of Potassium Hydroxide. As expected, Potassium Hydroxide is removed when the skin is removed. Potassium Hydroxide is further diluted with fresh water sprays in Magnusson scrubber.

*Note: 1) Sampled peaches used were conventional and my have had a foilar nutrient spray prior to harvest. this spray may have resulted in a higher level of K in the peach than in an organic peach.

2) Testing for K is a simplistic method for determining residue of Potassium Hydroxide. More expensive and precise testing would confirm results.

In the summer of 1997, J.R. Wood will repeat K tests on organic Cling peaches. Results should be available in late August.

CLOSING NOTES

J.R. Wood conducted all tests at it's own expense. J.R. Wood does not grow organic peaches. Until 1997, J.R. Wood did not buy or sell organic materials. J.R. Wood has worked strictly as a co-packer of organic products until 1997.

Since 1994, J.R. Wood has been advising organic peach growers not to plant additional organic acreage, as the organic peach puree market is saturated. Several organic growers have asked whether to continue with the orchards. The proceeds from

fresh marketing and puree contracts are not enough to keep the operations viable. None of these growers have varieties that will work at Noroian's cannery.

If there is no significant progress made with classifying Potassium Hydroxide as a processing aid specifically for producing IQF organic peaches in the next few months, J.R. Wood will be ethically bound to recommend that growers of organic peaches push the orchards out. Fresh returns without secondary income for processing, do not sustain conventional orchards or organic operations. California's organic peach growers need another value added outlet for their product. That outlet is IQF. IQF is not possible without Potassium Hydroxide.

Please contact Ron O'Bara for more information at: J.R. Wood, Inc.
P.O. BOX 545
Atwater, CA 95301
Phone - (209) 358-5643 ext. 216
Fax - (209) 358-9701

J.R. WOOD INCORPORATED
P.O. Box 545
Atwater, CA 95301

F A X C O V E R S H E E T

DATE:	June 26, 1997	TIME:	2:30 PM
TO:	Yvonne Frost Oregon Tilth	PHONE: FAX:	(503) 620-2829 (503) 624-1386
FROM:	Danny Galatro DG J.R. Wood, Inc.	PHONE: FAX:	(209) 358-5643 x227 (209) 358-9701
RE:	Organic IQF Peaches		

CC:

Number of pages including cover sheet: 7

Message

Ron O'Bara thought that you should receive a copy of this letter for your reference. It has been sent to Jack Bojorques and Ojai Organics.

Also, I am in the process of sending you baby food labels for Organic Baby and Mom's Organic Choice. Be expecting them in the mail early next week.

FAXED
6-26-97

Table A2-2

DETAILED WATER BALANCE AND NITROGEN, SALT AND BOD LOAD ASSESSMENT

PARAMETER	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	TOTAL
AVG. RAIN, IN	0.0	0.0	0.2	0.5	1.3	1.7	2.1	1.9	1.7	1.2	0.5	0.1	11.0
1-25 YR RAIN, IN	0.0	0.0	0.3	0.9	2.5	3.2	4.1	3.7	3.2	2.3	0.6	0.2	21.0
WASTEWATER CHARACTERISTICS:													
VOLUME, MG	2.0	2.3.0	12.0	12.8	12.3	8.0	4.9	4.1	3.8	6.3	7.9	15.0	113.6
BOD_5, mg/L	2700	4000	3700	2000	1500	1200	500	1800	800	900	1500	1100	—
EFF BOD, mg/L (a)	1910	2788	2568	1318	831	518	162	976	162	512	541	652	—
NITROGEN, mg/L	23.9	61.0	75.5	99.2	53.7	11.2	0.9	0.9	0.8	5.4	1.0	10.5	—
NITROGEN, lb	478	1,701	13,852	5252	5511	747	37	31	25	284	62	1314	28,598
TDFS, mg/L	461	830	917	743	469	537	427	218	573	540	768	435	—
TDFS, lb	9,214	15,921	168,151	81,457	48,111	35,762	17,458	10,170	18,160	28,373	40,318	54,418	728,152
PASTURE GRASS RECLAMATION AREAS (SUDAN GRASS & OATS, 141.28 AC)													
CROP WATER NEED, IN	7.8	6.6	4.8	3.3	1.5	0.7	0.9	1.7	3.2	4.5	6.5	7.5	
IRRIGATION NEED IN 1-25 YR, IN	7.8	6.6	4.5	2.4	0.0	0.0	0.0	0.0	0.0	2.2	5.9	7.3	
IRRIGATION NEED, MG	29.9	25.3	17.3	9.2	0.0	0.0	0.0	0.0	0.0	8.4	22.6	28.0	140.7
NITROGEN NEED, lb	8400	8400	8300	4000	1700	1700	1700	2000	2800	7100	8400	8400	
EFFLUENT APPLIED:													
• FROM PONDS, MG	19.0	9.0	8.0	9.2	3.0	8.0	4.9	4.1	0.0	0.0	0.0	0.0	82.3
• FROM STORAGE, MG	0.0	0.0	0.0	0.0	0.0	1.1	2.5	3.0	3.6	2.4	9.0	0.0	
EFF N APPLIED:													
• FROM PONDS, lb	2791	4571	5037	3980	1314	747	37	31	0.0	0.0	0.0	0.0	29,978
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	582	1323	1587	1705	1270	4761	0.0	
EFF BOD APPLIED, lb/ac/day (b)	51	118	40	21	5	8	2	9	~0	~0	~0	~0	
TDFS APPLIED:													
• FROM PONDS, lb	53,826	67,200	61,982	61,052	17,734	35,762	17,458	10,170	0.0	0.0	0.0	0.0	375,646
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	4868	15,610	18,732	24,978	14,986	56,196	0.0	
• PER ACRE, lb/ac	381	476	438	429	83	303	234	205	159	106	398	0.0	
• CUMULATIVE, lb/ac	381	822	1255	1709	1792	2095	2329	2534	2813	2787	3187	3187	3187
GRAPE RECLAMATION AREA (141.8 AC)													
CROP WATER NEED, IN	6.7	5.5	3.5	1.4	0.0	0.0	0.0	0.0	0.0	0.7	3.8	5.8	
IRRIGATION NEED IN 1-25 YR, IN	6.7	5.5	3.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	3.2	5.6	
IRRIGATION NEED, MG	2.4	2.1	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.1	
NITROGEN NEED, lb	300	300	200	100	0.0	0.0	0.0	0.0	0.0	200	300	300	
EFFLUENT APPLIED:													
• FROM PONDS, MG	0.0	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	3.1	1.5	0.0	5.7
• FROM STORAGE, MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EFF. N APPLIED:													
• FROM PONDS, lb	0.0	305	189	82	0.0	0.0	0.0	0.0	0.0	110	13	0.0	729
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EFF. BOD APPLIED, lb/ac/day (b)	0.0	32	15	5	0.0	0.0	0.0	0.0	0.0	19	15	0.0	
TDFS APPLIED:													
• FROM PONDS, lb	0.0	4153	2274	1323	0.0	0.0	0.0	0.0	0.0	5761	7608	0.0	31,139
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• PER ACRE, lb/ac	0.0	294	163	94	0.0	0.0	0.0	0.0	0.0	989	681	0.0	
• CUMULATIVE, lb/ac	0.0	294	457	551	551	551	551	551	551	1540	2221	2221	2221
PEACH RECLAMATION AREA (135.16 AC)													
CROP WATER NEED, IN	7.5	6.4	4.9	2.2	0.0	0.0	0.0	0.0	1.9	3.2	5.4	6.7	
IRRIGATION NEED IN 1-25 YR, IN	7.5	6.4	4.1	1.7	0.0	0.0	0.0	0.0	0.0	0.9	4.8	6.5	
IRRIGATION NEED, MG	27.5	23.5	15.0	6.2	0.0	0.0	0.0	0.0	0.0	3.3	17.6	23.9	
NITROGEN NEED, lb	2000	2000	2000	800	0.0	0.0	0.0	0.0	1000	1500	2000	2000	
EFFLUENT APPLIED:													
• FROM PONDS, MG	10.0	3.9	3.1	1.9	0.0	0.0	0.0	0.0	3.8	3.2	5.9	15.0	55.6
• FROM STORAGE, MG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.5	3.6	1.3	
EFF. N APPLIED:													
• FROM PONDS, lb	1993	1184	1152	780	0.0	0.0	0.0	0.0	25	141	49	1314	17,835
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	741	1332	1905	687	
EFF. TDFS APPLIED, lb/ac/day (k)	38	22	16	5	0.0	0.0	0.0	0.0	1	2	6	20	
TDFS APPLIED:													
• FROM PONDS, lb	38,997	16,117	21,208	13,561	0.0	0.0	0.0	0.0	10,160	14,342	37,770	54,418	281,995
• FROM STORAGE, lb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8742	15,100	23,178	8187	
• PER ACRE, lb/ac	184	206	175	93	0.0	0.0	0.0	0.0	179	372	446	463	
• CUMULATIVE, lb/ac	284	490	665	758	758	758	758	758	937	1309	1755	2218	2218
STORAGE RESERVOIRS (POND #4 & 5; USEFUL STORAGE VOLUME ~ 38.9 MG)													
EFFLUENT IN:													
• VOLUME, MG	0.0	7.5	10.6	1.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• NITROGEN, lb	0.0	1883	4675	410	4165	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• TDFS, lb	0.0	45,720	81,611	4614	34,377	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
• BOD, lb/day (a)	0.0	7156	1632	377	2715	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EFFLUENT OUT:													
• VOLUME, MG	0.0	0.0	0.0	0.0	0.0	1.1	2.5	3.0	5.0	4.9	12.6	1.3	
• NITROGEN, lb	0.0	0.0	0.0	0.0	0.0	582	1323	1587	2646	2572	6666	687	
• TDFS, lb	0.0	0.0	0.0	0.0	0.0	4438	15,010	18,732	31,220	30,976	78,674	8187	
ACCUMULATION:													
• VOLUME, MG	0.0	9.5	20.1	21.1	30.4	27.3	26.8	23.8	18.8	13.9	1.3	0.0	
• NITROGEN, lb	0.0	1833	6,508	6,918	10,603	15,501	14,178	12,591	9945	7353	687	0.0	
• TDFS, lb	0.0	65,760	147,436	152,110	186,891	183,711	167,377	148,645	117,307	86,701	8187	0.0	

Table A2-3

REVISED RECLAMATION AREA ACREAGES AND CROPS (a)

BLOCK#	EFFECTIVE IRRIGABLE ACREAGE (b)	CROP (s)
09	12	WINTER OATS/SUMMER SUDAN GRASS
09	1.72	PEACHES
041	36.39	PEACHES
092, 044, 045	78.66	WINTER OATS/SUMMER SUDAN GRASS
042	17.29	PEACHES
043	22.54	PEACHES
046	21.25	PEACHES
047	10.9	PEACHES
048	11.6	PEACHES
049	13.47	PEACHES
050	14.11	GRAPES
091	13.52	WINTER OATS/SUMMER SUDAN GRASS
093	37.1	WINTER OATS/SUMMER SUDAN GRASS
TOTALS BY CROP	14.11	GRAPES
	141.28	WINTER OATS/SUMMER SUDAN GRASS
	135.16	PEACHES

(a) AS OF JANUARY, 1996. SOURCE: J.R. WOOD.

(b) ACTUAL ACREAGE GROWING CROPS AND UNDER IRRIGATION.

Table A2-4

RECLAMATION SYSTEM NITROGEN NEEDS

CROP	J.R. WOOD CROP ACREAGE	NITROGEN USE ESTIMATE (a)	NITROGEN NEED (a)
SUMMER SUDAN	141.28 ac	325 lb/ac/yr	45,916 lb/yr
WINTER OATS (b)	141.28 ac	80 lb/ac/yr	11,302 lb/yr
GRAPES	14.11 ac	125 lb/ac/yr	1,764 lb/yr
PEACHES	135.16 ac	95 lb/ac/yr	12,840 lb/yr
ESTIMATED CROP NITROGEN NEED			71, 822 lb/yr

(a) SOURCE: WESTERN FERTILIZER HANDBOOK. NITROGEN NEEDS OF THE HARVESTED PORTION OF THE CROP, I.E., THESE FIGURES DO NOT INCLUDE THE NITROGEN UPTAKE OF THE WOODY, NON-HARVESTED GROWTH OF PEACH TREES AND GRAPE VINES.

(b) WINTER OATS ARE ESTIMATED TO NEED ONLY 70% OF THE NITROTEN OF A CONVENTIONAL OAT CROP.

Table A2-5

PROJECTED J.R. WOOD RECLAMATION SYSTEM TREATMENT PERFORMANCE

	Value by Month												
Parameter	J	A	S	O	N	D	J	F	M	A	M	J	TOTAL
Flow, MG	24	23	22	12.8	12.3	8.0	4.9	4.1	3.8	6.3	7.4	15	143.6
BOD_{in}, mg/L	2,700	4,000	3,700	2,000	1,500	1,200	500	1,800	800	900	1,500	1,100	---
Digester:													
k_d, Day^{-1}	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	---
BOD_{out}, MG/l	2,338	3,443	3,180	1,906	1,160	819	284	989	404	573	998	887	---
Ponds:													
k_p, day^{-1}	0.040	0.040	0.040	0.040	0.035	0.030	0.024	0.030	0.035	0.035	0.040	0.040	---
BOD_{out}, mg/L	1,910	2,789	2,569	1,318	837	528	162	476	152	312	541	652	---

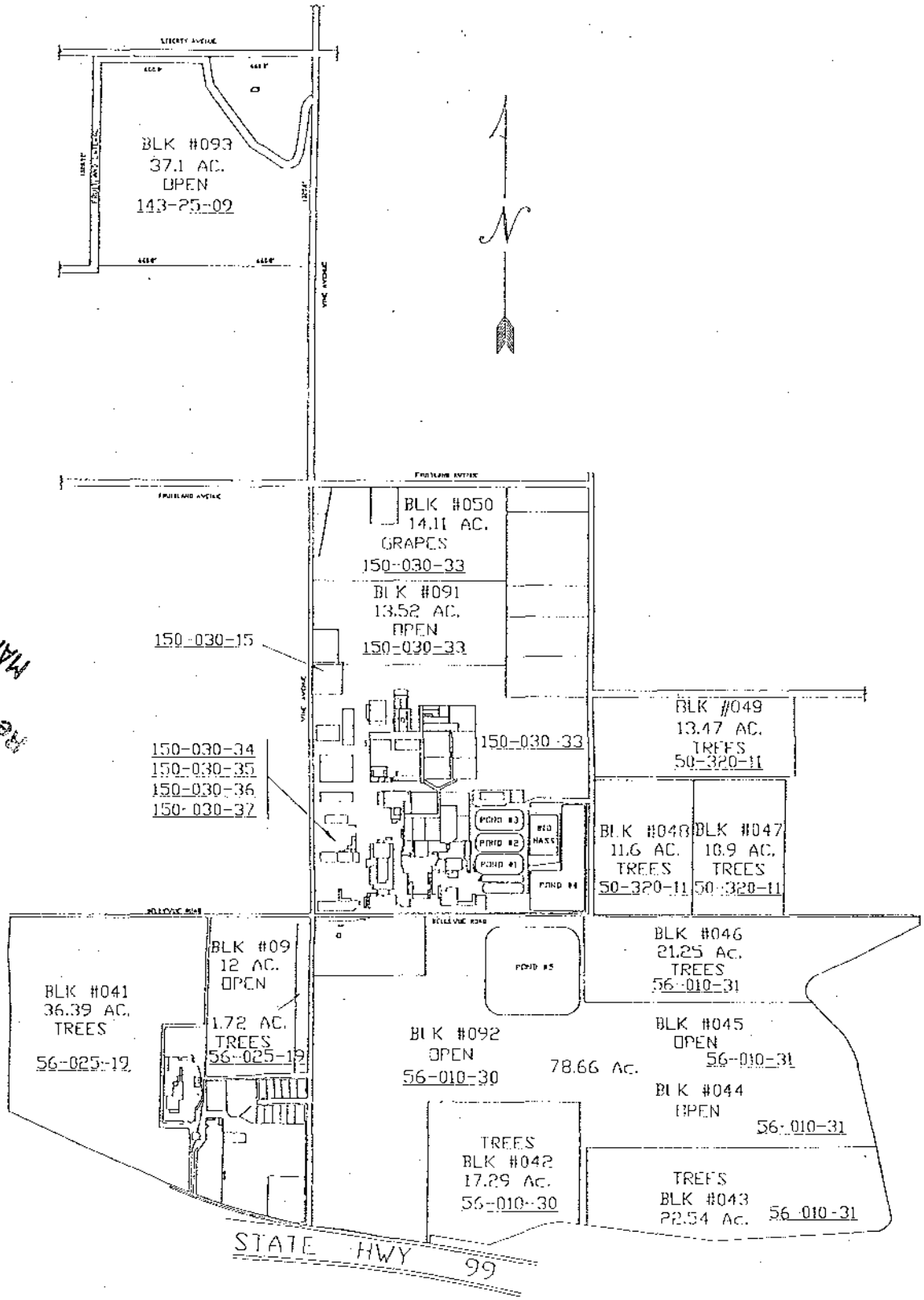


Figure A2-1

RECLAMATION AREA PARCELS AND ACREAGE

A2-11

Appendix A2-1
Salt Data

ECO:LOGIC

PROJECT J. R. WOOD	JOB NO.	BY RES	DATE 3/19/96
JECT SALT UPTAKE BY CROPS		CHECKED NO	PG 1 OF 2

AT THE REQUEST OF LARRY LOWE (REGIONAL BOARD, FRESNO OFFICE), I CONTACTED UCD TO GET THE INPUT OF UCD RESEARCHERS ON THE SUBJECT OF SALT UPTAKE BY CROPS. THE FOLLOWING INFORMATION IS THE RESULT OF THOSE CONTACTS:

CROP	SALT (MINERAL ASH) CONTENT	REFERENCE
PEACHES	5.3% OF DRY WEIGHT (PEACHES ARE 85-87% H_2O)	TED d'JUNG 752-0122 (POMOLOGY)
SUDAN GRASS, WINTER OATS	NO SPECIFIC VALUE FOR THESE SPECIFIC GRASSES, INFORMATION FOR BARLEY IS AVAILABLE AND IS THOUGHT TO BE REPRESENTATIVE: 300 lb SALT / TON DRY (GRASS IS ~90% H_2O)	BILL RAINS 752-1711 (AGRONOMY & RANGE SCIENCE)
GRAPES	20.4 lb / TON WET (SEE BELOW)	LARRY WILLIAMS 209-891-2500 KEARNEY AG. CENTER

GRAPES:

MINERAL NUTRIENT	NUTRIENT HARVESTED	SALT FORM OF NUTRIENT	SALT HARVESTED
N	1.46 kg/tonne	NO_3^-	6.47 kg/tonne
P	0.28 kg/tonne	PO_4^-	0.86 kg/tonne
K	2.47 kg/tonne	K^+	2.47 kg/tonne
Ca	0.50 kg/tonne	Ca^{++}	0.50 kg/tonne
Mg	0.10 kg/tonne	Mg^{++}	0.10 kg/tonne
NON-NUTRIENT MINERALS	NOT REPORTED	NON-NUTRIENT SALTS	NOT REPORTED

TOTAL SALT REMOVED BY HARVEST > 10.40 kg/tonne (WET)

$\frac{10.40\ kg}{1000\ kg} = \frac{10.40\ lb}{1000\ lb} = \frac{20.8\ lb}{TON}$

OF WHICH "N" IS:

$\frac{1.46}{10.40}\left(20.8\ \frac{lb}{T}\right) = 2.92\ lb/TON$

ECO:LOGIC

PROJECT	JOB NO.	BY	DATE 3/19/96
SUBJECT		CHECKED	PG 2 OF 2

CROP	J.R. WOOD REPORTED CROP YIELD	SALT UPTAKE THAT IS HARVESTED WITH CROP	% H_2O	TYPICAL CROP YIELD ON A DRY WT. BASIS	TYPICAL AMOUNT OF SALT HARVESTED
PEACHES	25-30 WET TON / AC-YR	5.3% OF DRY WT.	~86%	3.85 DRY TON / AC-YR	408 lb / AC-YR
GRAPES	11-12 WET TON / AC-YR	≥20.8 lb / WET TON	NA	NA	≥239 lb / AC-YR
SUDAN GRASS	30-32 WET TON / AC-YR	300 lb / DRY TON	~90%	4.20 DRY TON / AC-YR	1260 lb / AC-YR
WINTER OATS	10-12 WET TON / AC-YR				

ALLOWABLE SALT APPLICATION TO THE PARCELS AND TO THE RECLAMATION AREA AS A WHOLE UNDER THE "DAIRY GUIDELINES"

CROP	CROP ACREAGE	SALT HARVESTED PER ACRE	ALLOWABLE SALT APPLICATION PER ACRE*	ALLOWABLE SALT APPLICATION OF W/W ORIGINS
PEACHES	135.16 ac	408 lb/ac·yr	2408 lb/ac·yr	325,465 lb/yr
GRAPES	14.11 ac	≥239 lb/ac·yr	2239 lb/ac·yr	≥31,592 lb/yr
SUDAN GRASS & WINTER OATS	141.28 ac	1260 lb/ac·yr	3260 lb/ac·yr	460,573 lb/yr
TOTAL ALLOWABLE SALT APPLICATION				817,574 lb/yr

* BASED ON DIARY GUIDELINE THAT UP TO 2000 lb/ac·yr CAN BE APPLIED PER YEAR IN EXCESS OF CROP DEMANDS WITHOUT THREATENING GROUNDWATER QUALITY.

SUMMARY:

BASED ON CROP-SPECIFIC INPUT FROM UCD STAFF AND THE "DAIRY GUIDELINE", THE J.R. WOOD RECLAMATION AREA COULD RECEIVE ~818,000 lb/yr OF TDFS. THE J.R. WOOD FOOD PROCESSING WATER CONTAINS ABOUT 764,000 lb/yr OF TDFS; THUS, THERE SHOULD BE NO SIGNIFICANT TDFS PROBLEMS ASSOCIATED WITH THE PROPOSED RECLAMATION PROJECT.

THE UCD DATA INDICATE THAT THE SALT UPTAKE ESTIMATES FOR GRAPES WERE HIGH, PEACHES WERE LOW, AND FODDER CROPS WERE LOW. THE NET EFFECT IS 1) THE RECLAMATION AREA CAN RECEIVE MORE SALT THAN ORIGINALLY ESTIMATED, AND 2) SOME WATER CURRENTLY SHOWN GOING TO THE GRAPES SHOULD BE TRANSFERRED [illegible] PEACHES. THIS WILL BE DONE

Appendix A2-2
Digester Performance Analysis

ECO:LOGIC

PROJECT J.R. WOOD	JOB NO.	BY RES	DATE / /
SUBJECT ANAEROBIC DIGESTER / FILTER		CHECKED	PG 1 OF 3

- MODEL RESULTS OF ANAEROBIC DIGESTER / FILTER SO AS TO PREDICT FUTURE PERFORMANCE.

- 1ST ORDER KINETIC MODEL WITH EMPIRICALLY DERIVED K SHOULD BE ADEQUATE. FIRST, VERIFY THAT ANAEROBIC PROCESSES ARE CONSIDERED TO BE SIMILAR TO AEROBIC PROCESSES KNOWN TO FOLLOW SIMPLE 1ST ORDER KINETIC MODELS:

$$\theta = \frac{1}{\frac{Yk S^{eff}}{K_c + S^{eff}} - b}$$

DIGESTER
WEF MOP #8 p. 1274

$$\theta = \frac{1}{\frac{\mu_m S}{K_s + S} - k_d}$$

ACT SLUDGE
M&E p. 375

DETAILED ANALYTICAL EQUATIONS SIMILAR THEREFORE SIMPLE FIRST-ORDER KINETIC MODEL IS A VALID EMPIRICAL MODEL FOR EXTRAPOLATING RESULTS FROM A FIXED FILM PROCESS.

- FIRST-ORDER KINETIC MODEL

$$\frac{BOD_{OUT}}{BOD_{IN}} = \frac{1}{1 + k\theta_H}$$

θ_H — HYDRAULIC RESIDENCE TIME OF REACTOR, DAYS

k — KINETIC DECAY RATE, DAY^{-1}

SEE PAGE 2 & 3, FROM THESE PAGES A REASONABLE, CONSERVATIVE MODEL FOR THE DIGESTER IS:

$$\frac{BOD_{OUT}}{BOD_{IN}} \lesssim \frac{1}{1 + 0.06\,\theta_H}$$

ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
JECT		CHECKED	PG 2 OF 3

DETERMINATION OF APPARENT "K" TERMS FOR 2 YEARS OF DATA

					DIGESTER(a)			3-POND SERIES	
MONTH	BOD_{IN_D}	$\frac{BOD_{OUT_D}}{BOD_{IN_P}}$	BOD_{OUT_P}	Q MG.	θ_H	k_D	REMOVAL lb/day	REMOVAL lb/day	k_P
JAN 93	357	45	73	0.8	77.5	0.0085	67.2		
FEB	785	437*	110	3.2	17.5	0.0455	332		0.049
MAR	741	474*	132	2.5	24.8	0.0227	180		0.032
APR	1605	179	47	2.6	23.1	0.3449	1031		0.036
MAY	1698	800	115	5.0	12.4	0.0905	1208		0.1086
JUNE	4109	912	310	2.6	23.1	0.1518	2311	435	0.028
JULY	3539	920	223	6.1	10.2	0.2791	4298	1,144	0.0879
AUG	4661	3420	326	10.6	5.85	0.0620	3539	8,823	0.301
SEPT	5019	3942	1147	5.5	10.9	0.0251	1647	4,274	0.0691
OCT	3990	1884*	568	3.6	17.2	0.0650*	2040	1,275	0.0422
NOV	4536	1473	238	2.4	25.0	0.0832	2044		0.0495
DEC '93	2602	380	41	2.1	29.5	0.1982	1255		0.0551
JAN '94	508	108	15	2.9	21.4	0.1731	312		0.117
FEB	2761	330	167	2.1	26.7	0.2759	1520		0.0141
MAR	106	56	30	1.8	34.4	0.0260	24		—
APR	560	415*	35	3.8	15.8	0.0221	153		0.120
MAY	760	520*	15	4.4	14.1	0.0327	284		0.237
JUNE	757	620	228	9.3	6.45	0.0343	354	1013	0.091
JULY	2646	513	240	9.2	6.74	0.1685	5279	676	0.0633
AUG	3373	1578	323	10.0	6.20	0.1835	4829	3,376	0.166
SEPT	3824	2930*	1238	10.0	6.00	0.0509*	2485	4,704	0.082
OCT	2829	1059	473	6.3	9.84	0.1699	3000	993	0.046
NOV	2071	1173*	228	6.3	9.52	0.0804*	1573		0.113
DEC '94	855	275	8	4.0	15.5	0.1361	624		—

(a) LIQUID VOLUME IS ESTIMATED TO BE ~3 MG W/O ANY SLUDGE. THE CURRENT EFFECTIVE VOLUME IS PROBABLY ≤2 MG BECAUSE OF SLUDGE. BECAUSE K WILL BE EXTRAPOLATED, AN ERROR IN ESTIMATING EFFECTIVE VOLUME SHOULD NOT BE SIGNIFICANT AS LONG AS NO SUBSEQUENT CLAIM IS MADE TO THE EFFECT THAT SUBSTANTIAL TREATMENT CAPACITY CAN BE GAINED BY CLEANING THE DIGESTER.

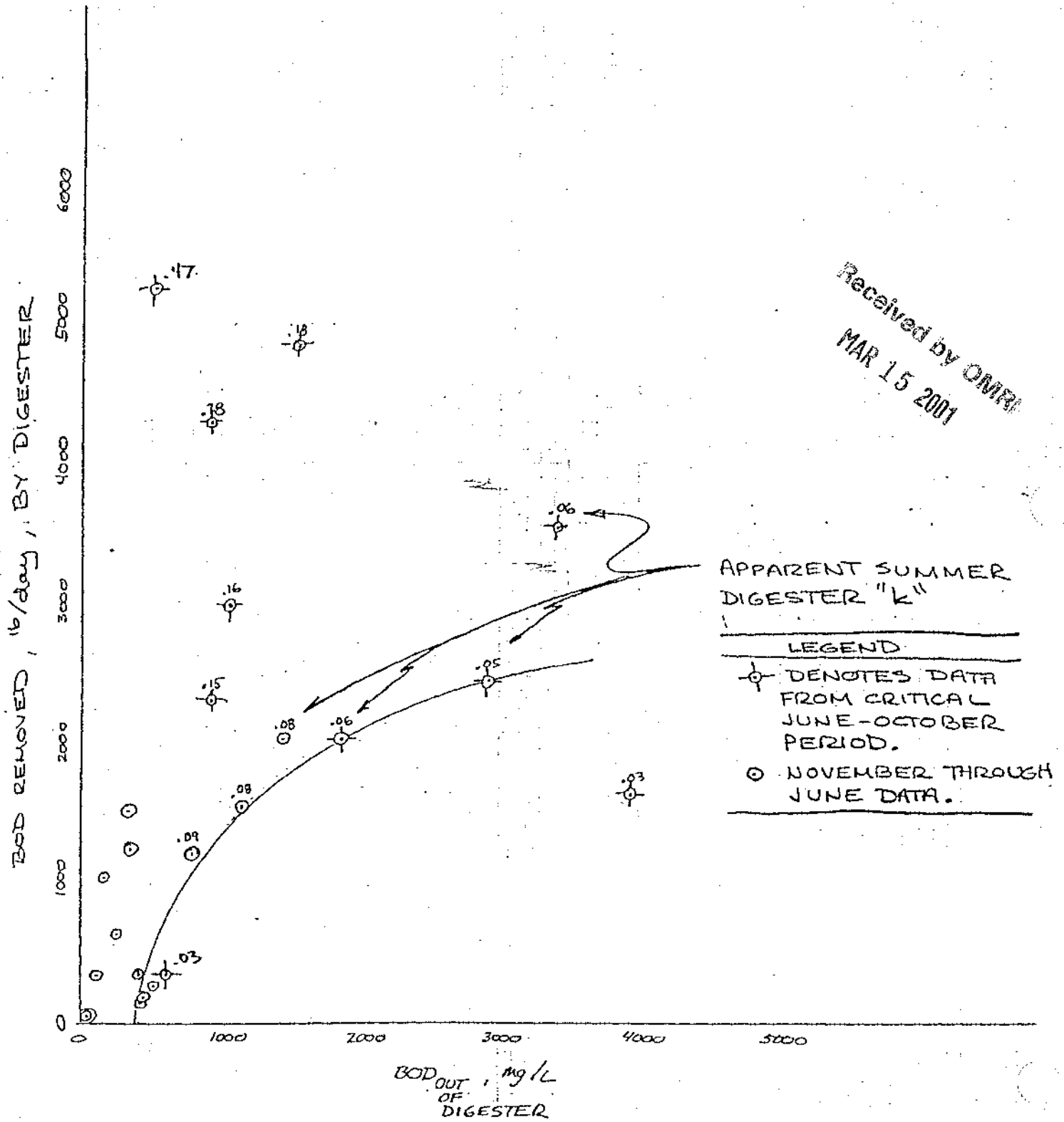
$\theta_H \sim (2\,MG) / (Q \div$ #DAY IN MONTH$)$

$$K_D \sim \frac{\frac{BOD_{IN}}{BOD_{OUT}} - 1}{\theta_H}$$

$$\text{REMOVAL, lb/day} = \frac{(BOD_{IN} - BOD_{OUT})(MG)(8.34)}{\#\text{ DAY IN MONTH}}$$

ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
SUBJECT		CHECKED	PG 3 OF 32



Appendix A2-3
Treatment Pond Performance Analysis

ECO:LOGIC

PROJECT J.R. WOOD	JOB NO.	BY	DATE / /
SUBJECT AERATED POND SYSTEM		CHECKED	PG 1 OF 3

- MODEL PERFORMANCE OF EXISTING SYSTEM TO PREDICT FUTURE PERFORMANCE.

ACCEPTED MODEL FORM FOR AERATED PONDS:

$$\frac{BOD_{OUT}}{BOD_{IN}} = \frac{1}{1+k\theta_H}$$

POND VOLUMES ARE REPORTED TO BE APPROXIMATELY
POND 1 ~ 1.6 MG
POND 2 ~ 1.1 MG
POND 3 ~ 1.35 MG

THE AVERAGE POND VOLUME IS 1.35 MG. IN SANGER ANALYSIS OF ATWATER DATA IT WAS SHOWN THAT USING THE AVERAGE VOLUME TO SIMPLIFY ANALYSIS DID NOT RESULT IN ANY SIGNIFICANT ERRORS WITHIN THE CONTEXT OF "ERROR" INTRODUCED FROM UNCONTROLLABLE VARIABLES RELATED TO SAMPLING, W/W CHARACTERISTICS, AND CLIMATIC FACTORS. (SEE 11/11/93 SANGER CALC P-1/11 IN "DESIGN REPORTS")

MODEL BASED ON 3 - 1.35 MG PONDS:

$$\frac{BOD_{OUT\,POND\,3}}{BOD_{IN\,POND\,1}} = \left(\frac{1}{1+k\,\frac{1.35\,MG}{Q,\,MGD}}\right)^3$$

WORKING FORM FOR ANALYSIS OF 1993/94 DATA

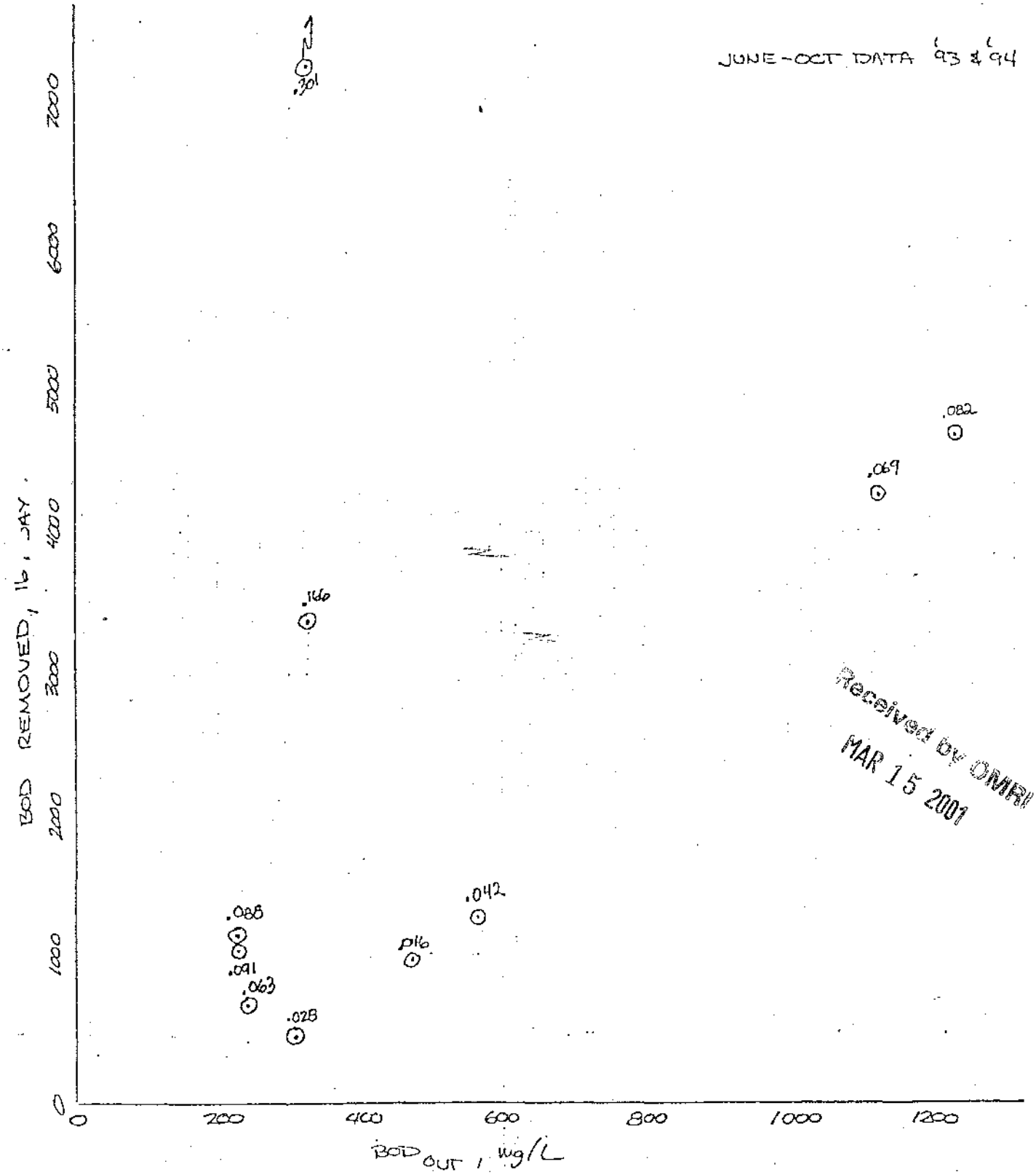
$$k = \frac{Q}{1.35}\left(\left[\frac{BOD_{IN}}{BOD_{OUT_3}}\right]^{.333} - 1\right)$$

FROM ANALYSIS, IT APPEARS THAT K UNDER CRITICAL SUMMER/LATE SUMMER CONDITIONS WILL HAVE A VALUE IN EXCESS OF 0.04/DAY AT SUMMER WATER TEMPS.

$$\frac{BOD_{OUT\,POND\,3}}{BOD_{IN\,POND\,1}} = \left[\frac{1}{1+.04\left(\frac{1.35\,MG}{Q}\right)}\right]^3$$

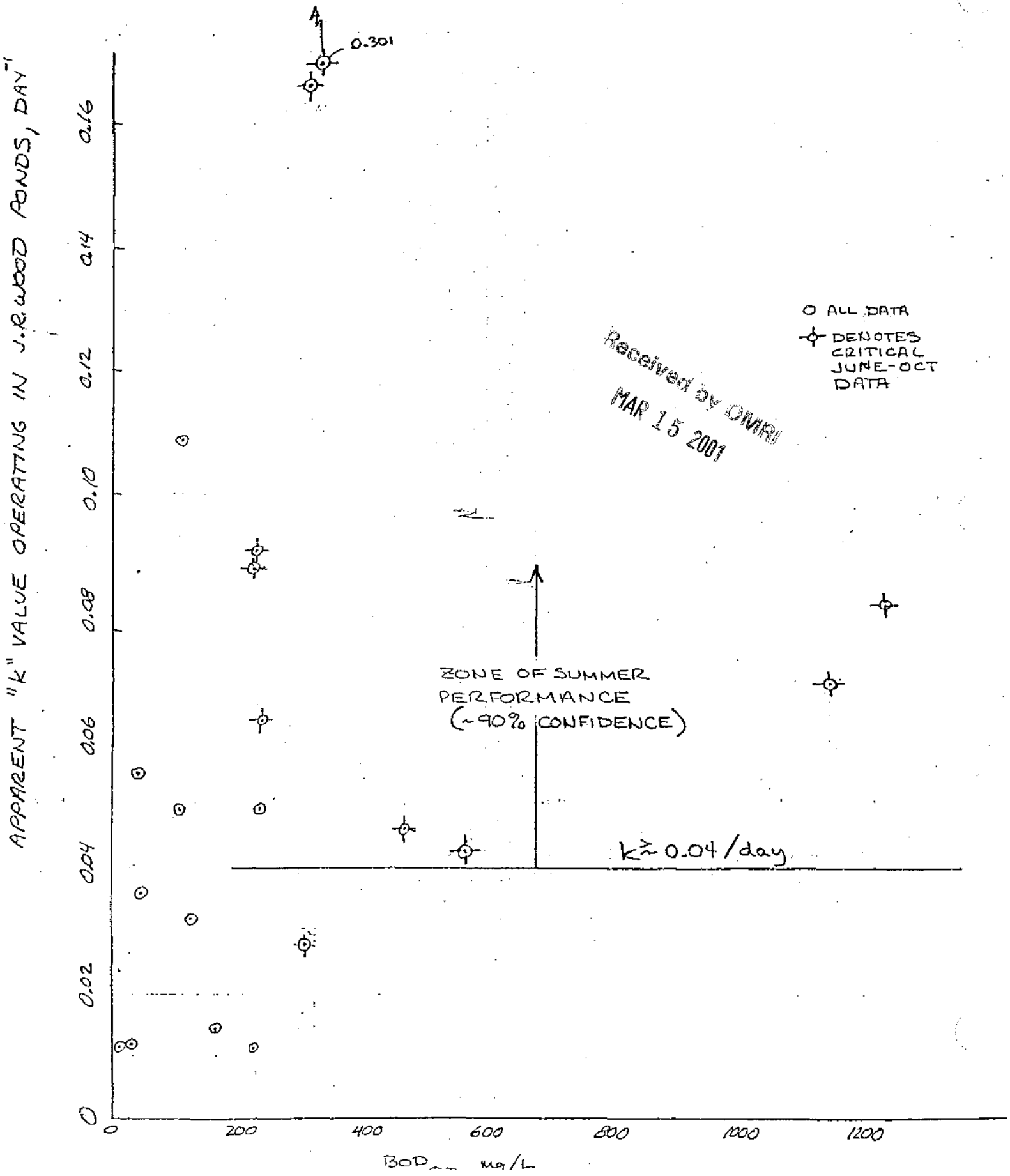
ECO:LOGIC

PROJECT	JOB NO.	BY	DATE / /
SUBJECT		CHECKED	PG 2 OF 3



ECO:LOGIC

PROJECT	JOB NO.	BY	DATE 1 1
SUBJECT		CHECKED	PG 3 OF 3



Appendix A2-4
General Data

Table 4-1

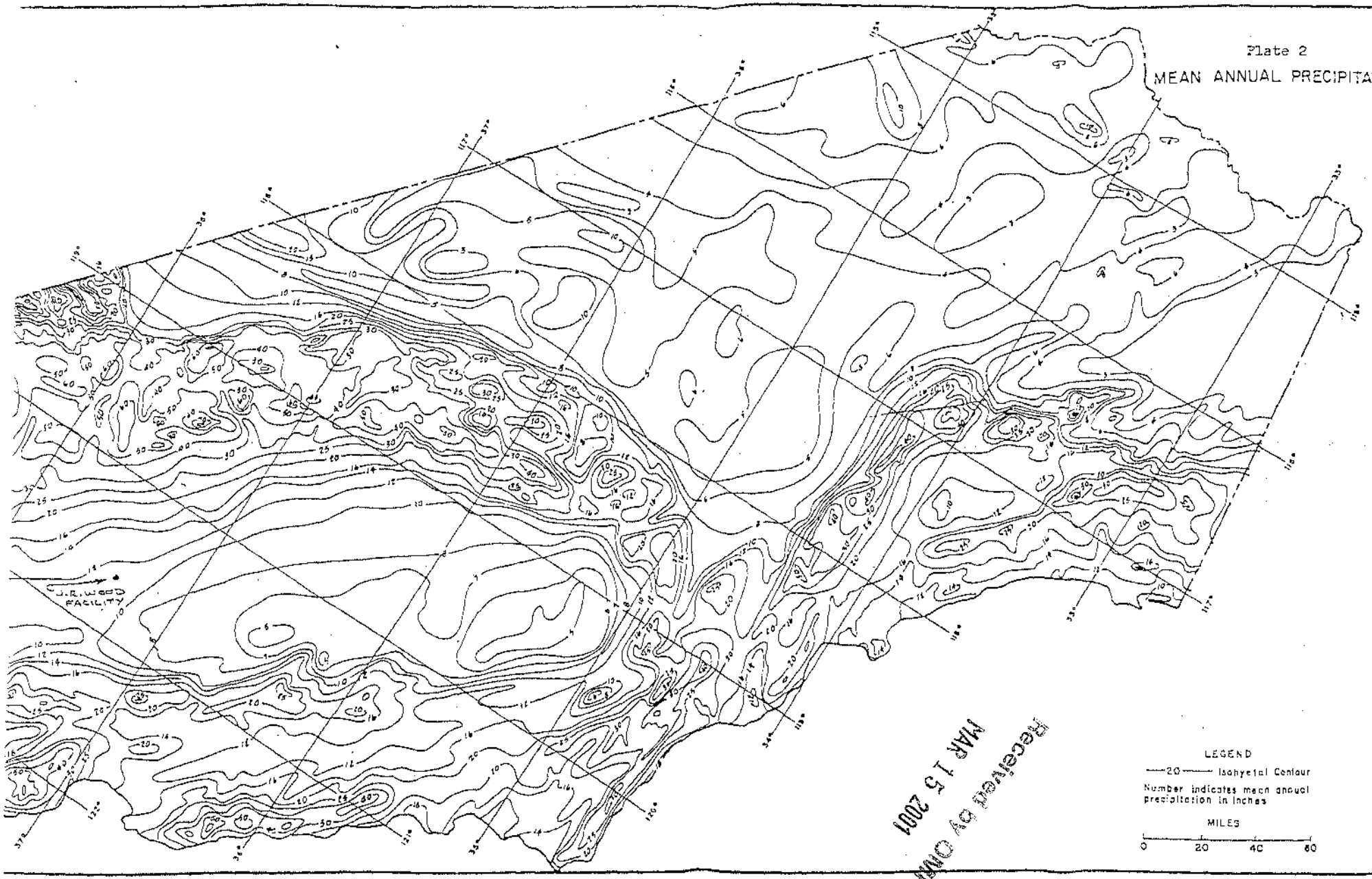
Plant Food Utilization by Various Crops[1]

Crop	Yield	Pounds per Acre N	P_2O_5	K_2O
Field crops				
Barley	2½ t. (104 bu.)	160	60	160
Corn (grain)	5 t. (179 bu.)	240	100	240
Corn (silage)	30 t.	250	105	250
Cotton (lint)	1,500 lbs.	180	65	125
Grain sorghum	4 t. (143 bu.)	250	90	200
Oats	3,200 lbs. (100 bu.)	115	40	145
Rice	7,000 lbs.	110	60	150
Safflower	4,000 lbs.	200	50	150
Soybeans	3,600 lbs. (60 bu.)	325	65	145
Sugar beets	30 t.	255	60	550
Wheat	3 t. (100 bu.)	175	70	200
Vegetable crops				
Asparagus	3,000 lbs.	95	50	120
Beans (snap)	10,000 lbs.	175	40	200
Broccoli	18,000 lbs.	80	30	75
Cabbage	35 t.	270	65	250
Celery	75 t.	280	165	750
Lettuce	20 t.	95	30	200
Potatoes (Irish)	500 cwt.	270	100	550
Squash	10 t.	85	20	120
Sweet potatoes	15 t.	155	70	315
Tomatoes	30 t.	180	50	340
Fruit and nut crops				
Almonds (in shell)	3,000 lbs.	200	75	250
Apples	15 t.	120	55	215
Cantaloupes	30 t.	220	70	400
Grapes	15 t.	125	45	195
Oranges	30 t.	265	55	330
Peaches	15 t.	95	40	120
Pears	15 t.	85	25	95
Prunes	15 t.	90	30	130
Forage crops				
Alfalfa	8 t.	480	95	480
Bromegrass	5 t.	220	65	315
Clovergrass	6 t.	300	90	360
Orchardgrass	6 t.	300	100	375
Sorghum-sudan	8 t.	325	125	475
Timothy	4 t.	150	55	250
Vetch	7 t.	390	105	320
Turf crops				
Bentgrass	2½ t.	260	65	145
Bermudagrass	4 t.	225	40	160

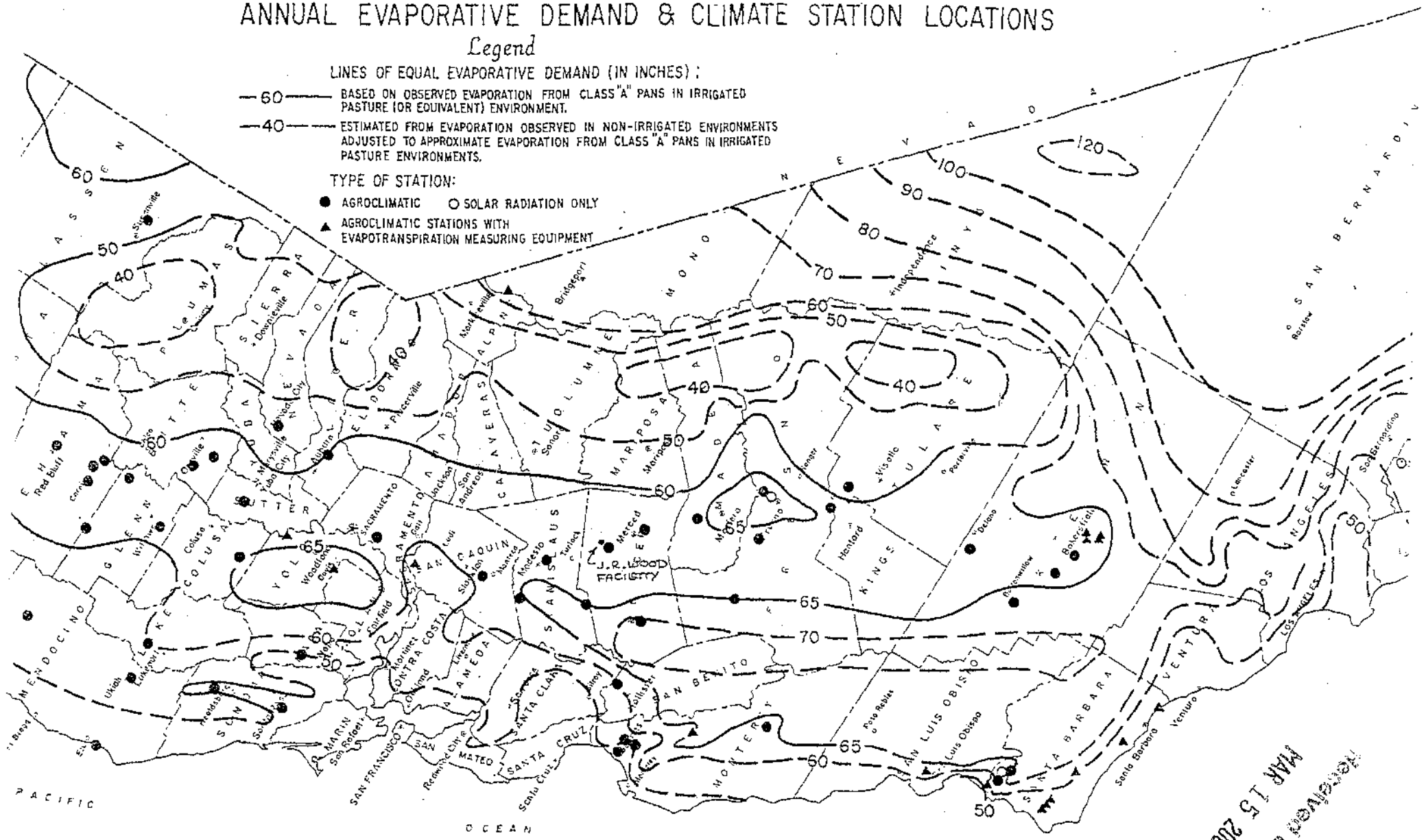
[1]Total uptake in harvested portion

Plate 2

MEAN ANNUAL PRECIPITATION



ANNUAL EVAPORATIVE DEMAND & CLIMATE STATION LOCATIONS



ECO:LOGIC

PROJECT J.R. WOOD	JOB NO.	BY	DATE 1 1
SUBJECT ESTIMATES OF EXISTING TREATMENT		CHECKED	PG 1 OF 3

ISSUE: IF EXISTING J.R. WOOD WASTEWATER TREATMENT SYSTEM REMAINS IN SERVICE (WITH ADDITIONAL AERATION AS NECESSARY), WHAT APPROXIMATE LEVEL OF AERATION WOULD BE NEEDED IN THE 35.8 MG AERATED STORAGE PONDS (4 & 5).

APPROXIMATION:

- USE ~90% CONFIDENCE LEVEL PERFORMANCE OF DIGESTER (I.E., DIGESTER PERFORMANCE IS POORER THAN EXPECTED ABOUT 1/10% OF THE TIME:

$$\frac{BOD_{OUT}}{BOD_{IN}} \lessapprox \frac{1}{1+\frac{0.06}{DAY}\theta_H}$$

BASED ON EFFECTIVE DIGESTER VOLUME OF ~ 2MG

CRITICAL MONTH IS SEPTEMBER: Q ~ 21 MG/M = 0.7 MGD
BOD ~ 3700 mg/L

$$\frac{BOD_{OUT}}{3700\ mg/L} = \frac{1}{1+\frac{0.06}{DAY}\left(\frac{2\ MG}{0.7\ MGD}\right)}$$

$BOD_{OUT} = 3159\ mg/L$

Received by OMRI MAR 15 2001

- USE ~90% CONFIDENCE LEVEL PERFORMANCE OF 3 AERATED PONDS IN SERIES:

$$\frac{BOD_{OUT}}{BOD_{IN}} = \left[\frac{1}{1+\frac{.04}{DAY}\left(\frac{1.35\ MG}{0.7\ MGD}\right)}\right]^3$$

$BOD_{IN} \leftarrow 3159\ mg/L$

$BOD_{OUT} \sim 2528\ mg/L$

SAY MAX 2 WEEK PERIOD IS ~ 0.5 MGD

- VOLUME OF WATER TO STORAGE ≈ $\frac{14.3\ MG - 5.1\ MG}{30\ DAYS} \sim \frac{9.2\ MG}{30\ DAYS} \sim 0.31$ MGD ON 30 DAY BASIS!
- THE BOD REDUCTION CHARACTERISTICS OF THE AERATED STORAGE POND SHOULD BE SIMILAR TO THOSE OF THE AERATED TREATMENT POND EXCEPT THAT THE ~90% CONFIDENCE LEVEL IS BASED ON HOW HIGH THE TREATMENT RATE MAY GET TO TRY TO BE SURE THERE IS ENOUGH AERATION POTENTIAL, IF NEEDED.

FROM PAST DATA IT APPEARS THAT K COULD BE AS HIGH AS ~ 0.09/DAY.

POND 4: EFFECTIVE VOL ≈ 10.3 MG. FROM WATER BALANCE: SEPT 1 STARTS WITH 5.1 MG (IN STORAGE) AND ENDS WITH 14.3 MG (WHICH IS > 10.3 MG. VOLUME OF POND 4; THUS, A FLOW THROUGH CONDITION EXISTS). ~1 MONTH

BASED ON FLOW THROUGH CONDITIONS & MODEL OF EXISTING AERATED POND PERFORMANCE:

POND 4: (POND 4 MAY BE LEAD STORAGE POND)

$$\frac{BOD_{OUT_4}}{2528\ mg/L} = \frac{1}{1+.09\left(\frac{\sim 12\ MG}{0.5\ MGD}\right)}$$

~ TOTAL LIQUID VOL EST.

$\Rightarrow BOD_{OUT_4} \sim 800\ mg/L$

← MAX SUSTAINED TO STORAGE

BOD REDUCTION $\approx (2528 - 800\ mg/L)(0.5\ MGD)(8.34) \sim 7206\ lb/d$

$$HP_{NEED} \approx \frac{7206\ lb/d}{1.2\ lb/hr \times 24\ hr/d} \sim \underline{250\ HP\ BASED\ ON\ BOD_5}$$

MINIMUM (MIX OF DIRECTIONAL & CONVENTIONAL)

* LOW END HP:

$$\frac{BOD}{2528} = \frac{1}{1+.04\left(\frac{12}{.5}\right)} \Rightarrow 1290.$$

$$\frac{(2528-1290)(.5)(8.34)}{1.2\times 24} \quad 180\ HP\ for\ BOD_5$$

WHAT IF THE KINETICS ARE ACTUALLY 0^{th}-ORDER, I.E., BOD SATURATED FROM A MICROBIOLOGICAL KINETIC PERSPECTIVE:

- EMPIRICAL 1ST-ORDER MODEL FIT IMPLIED k WAS IN 0.04 TO 0.09 /d RANGE (WHICH IS REASONABLE CONSIDERING BIOMASS & NUTRIENT POSSIBLE LIMITATIONS

BOD_{OUT} ESTIMATES: $k=0.04$ $2528\ mg/L$ (FROM PAGE 1/3)

$k=0.09$ $\frac{BOD_{OUT}}{3159} = \left[\frac{1}{1+.09\left(\frac{1.35}{.7}\right)}\right]^3 \Rightarrow BOD_{OUT}\ 1954$

Received by CIWEM MAR 15 2007

ΔBOD @ 0^{th} ORDER: $\frac{3159-2528}{3\left(\frac{1.35}{.7}\right)} = \frac{631\ mg/L}{5.79\ DAYS} = \frac{109\ mg/L}{DAY}$ (.8621)

$$\frac{3159-1954}{3\left(\frac{1.35}{.7}\right)} = \frac{208\ mg/L}{DAY}$$

SO POND 4 AS A HYDRAULIC RESIDENCE TIME OF $\approx \frac{12\ MG}{0.5\ MGD} \approx 24$ DAYS

0^{th} REDUCTION ESTIMATES:

$(24\ DAYS)(109\ mg/L/day) = 2616\ mg/L$

$(24\ DAYS)(208\ mg/L/day) = 4992\ mg/L$

→ MORE THAN PRESENT ∴ ALL WOULD BE GONE (BUT 1ST ORDER WOULD OCCUR & LIMIT TO SOM EXTENT!)

$(2528\ mg/L - 50\ mg/L)(0.5\ MGD)(8.34)/1.2\times 24 \approx 360\ HP\ for\ BOD_5$

GUESS AT LEFTOVER FROM 1ST ORDER

IF BOD_5 IS ~67% OF BOD_{TC} THEN CONVERTING TO BOD_L REQUIRES A 1.5 MULTIPLIER.

POND 4 SUMMARY: COULD NEED UP TO 540HP IN WORST CASE, I.E., POND 4 IN LEAD USE & LOW POND KINETICS & HIGH STORAGE KINETICS. PLAN FOR ~540 HP WITH MINIMUM INSTALLATION BEING

POND 5:

OPTION #1: POND 5 CAN FUNCTION AS LEAD POND. IN THIS CASE IT COULD HOLD HIGH STRENGTH SEPT. WASTE UNTIL ITS BOD IS ~ DEPLETED AT HIGH 0th RATE:

$$\frac{2528\ mg/L}{208\ \frac{mg/L}{DAY}} = 12 \text{ DAYS TO DEPLETE}$$

< SEPT STORAGE IS GREATER THAN 12 DAYS IN PONDS

AERATOR NEED: ≤ 540 HP JUST LIKE POND 4.

OPTION #2: POND 5 COULD ~~ONLY~~ RECEIVE WATER FROM POND 4. [NOTE: POND 4 COULD BE USED TO PROVIDE THE THREE FEET OF OPERATIONAL WATER NEEDED FOR THE AERATORS; THUS, INCREASING THE TOTAL EFFECTIVE STORAGE VOLUME OF THE SYSTEM BY 3.1 MILLION GALLONS]. THE MAXIMUM ESTIMATED BOD_5 LOAD WOULD THEN BE:

- 2528 mg/L OUT OF POND 3.
- POND 4 AT LOW KINETIC RATE (1ST ORDER) FOR 0.5 MGD FLOW TO STORAGE.

$$\frac{BOD_{OUT}}{2528} = \frac{1}{1+(.04)\left(\frac{12}{.5}\right)} = 1290\ mg/L$$

- POND 5:

$$(1290\ mg/L)(0.5\ MGD)(8.34) = 5380\ lb/day$$

$$\frac{5380\ lb/day}{(1.2)(24)}(1.5) \sim 280\ HP$$

POND 5 SUMMARY: IF POND 5 CAN TAKE EFFLUENT DIRECTLY THEN IT NEEDS UP TO ~ 540HP. IF POND 5 TAKES EFFLUENT ONLY FROM POND 4 AT THE CRITICAL TIME OF YEAR, THEN ITS HP NEED (WORST CASE) IS PROBABLY ABOUT 280HP (MINIMUM INITIAL INSTALLATION PROBABLY ABOUT ≈ 100 HP.

BASED ON FLOW THROUGH CONDITIONS & MODEL OF EXISTING AERATED POND PERFORMANCE:

POND 4: (POND 4 MAY BE LEAD STORAGE POND)

$$\frac{BOD_{OUT_4}}{2528\ mg/L} = \frac{1}{1+.09\left(\frac{\sim 12\ MG}{0.5\ MGD}\right)} \Rightarrow BOD_{OUT_4} \sim 800\ mg/L$$

(~ TOTAL LIQUID VOL EST.; ← MAX SUSTAINED TO STORAGE)

BOD REDUCTION $\approx (2528 - 809\ mg/L)(0.5\ MGD)(8.34) \sim 7206\ lb/d$

$$HP_{NEED} \approx \frac{7206\ lb/d}{1.2\ lb/hr \times 24\ hr/d} \sim 250\ HP\ BASED\ ON\ BOD_5$$

MINIMUM (MIX OF DIRECTIONAL & CONVENTIONAL)

* LOW END HP:

$$\frac{BOD}{2528} = \frac{1}{1+.04\left(\frac{12}{.5}\right)} \Rightarrow 1290.$$

$$\frac{(2528-1290)(.5)(8.34)}{1.2\times 24} \Rightarrow 180\ HP\ for\ BOD_5$$

WHAT IF THE KINETICS ARE ACTUALLY 0^{th}-ORDER, I.E., BOD SATURATED FROM A MICROBIOLOGICAL KINETIC PERSPECTIVE:

- EMPIRICAL 1ST-ORDER MODEL FIT IMPLIED k WAS IN 0.04 TO 0.09 /d RANGE (WHICH IS REASONABLE CONSIDERING BIOMASS & NUTRIENT POSSIBLE LIMITATIONS

BOD_{OUT} ESTIMATES: k = 0.04 2528 mg/L (FROM PAGE 1/3)

k = 0.09 $\frac{BOD_{OUT}}{3159} = \left[\frac{1}{1+.09\left(\frac{1.35}{.7}\right)}\right]^3 \Rightarrow BOD_{OUT} \sim 1954$

ΔBOD @ 0^{th} ORDER: $\frac{3159-2528}{3\left(\frac{1.35}{.7}\right)} = \frac{631\ mg/L}{5.79\ DAYS} = \frac{109\ mg/L}{DAY}$ (.8621)

$$\frac{3159-1954}{3\left(\frac{1.35}{.7}\right)} = \frac{208\ mg/L}{DAY}$$

SO POND 4 AS A HYDRAULIC RESIDENCE TIME OF $\approx \frac{12\ MG}{0.5\ MGD} \approx 24$ DAYS

0^{th} REDUCTION ESTIMATES:

(.24 DAYS)(109 mg/L/day) = 2616 mg/L

(.24 DAYS)(208 mg/L day) = 4992 mg/L → MORE THAN PRESENT ∴ ≈ ALL WOULD BE GONE (BUT 1ST ORDER WOULD OCCUR & LIMIT TO SOME EXTENT!)

$(2528\ mg/L - 50\ mg/L)(0.5\ MGD)(8.34)/1.2\times 24 \approx 360\ HP\ for\ BOD_5$

GUESS AT LEFTOVER FROM 1ST ORDER

IF BOD_5 IS ~67% OF BOD_{TK} THEN CONVERTING TO BOD_L REQUIRES A 1.5 MULTIPLIER.

POND 4 SUMMARY: COULD NEED UP TO 540 HP IN WORST CASE, I.E., POND 4 IN LEAD USE & LOW POND KINETICS & HIGH STORAGE KINETICS. PLAN FOR ~540 HP WITH MINIMUM INSTALLATION BEING

EPA 625/1-79-011

PROCESS DESIGN MANUAL
FOR
SLUDGE TREATMENT AND DISPOSAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

Municipal Environmental Research Laboratory
Office of Research and Development

Center for Environmental Research Information
Technology Transfer

September 1979

The characteristics of sludge gas from several digester installations are shown in Table 6-9. A healthy digestion process produces a digester gas with about 65 to 70 percent methane, 30 to 35 percent carbon dioxide, and very low levels of nitrogen, hydrogen, and hydrogen sulfide. The carbon dioxide concentration of digester gas has been found to increase with the loading rate (60,88).

TABLE 6-9

CHARACTERISTICS OF SLUDGE GAS[a] (85)

Constituent	Values for various plants, percent by volume[b]							
Methane (CH_4)	42.5	61.0	62.0	67.0	70.0	73.7	75.0	73 - 75
Carbon dioxide (CO_2)	47.7	32.8	38.0	30.0	30.0	17.7	22.0	21 - 24
Hydrogen (H_2)	1.7	3.3	-[c]	-	-	2.1	0.2	1 - 2
Nitrogen (N_2)	8.1	2.9	-[c]	3.0	-	6.5	2.7	1 - 2
Hydrogen sulfide (H_2S)	-	-	0.15	-	0.01 - 0.02	0.06	0.1	1 - 1.5
Heat value, Btu/cu ft	459	667	660	624	728	791	716	739 - 750
Specific gravity (air = 1)	1.04	0.87	0.92	0.86	0.85	0.74	0.78	0.70 - 0.80

[a]Data from 1966 studies by Herpers and Herpers.

[b]Except as noted.

[c]Trace.

The hydrogen sulfide content of the gas is affected by the chemical composition of the sludge (84). Sulfur-bearing industrial wastes and saltwater infiltration tend to increase H_2S levels in sludge gas. However, metal wastes and metal ions added during chemical treatment or conditioning can reduce the amount of H_2S in the sludge by forming insoluble salts. H_2S, a major source of odors in digested sludge, can also be corrosive in the presence of moisture, by forming sulfuric acid.

Although the hydrogen content has some effect on the heat value, methane is the chief combustible constituent in digester gas. The high heat value for digester gas ranges between 500 to 700 Btu per cu ft (4.5 to 6.2 kg-kcal/m^3), with an average of about 640 Btu per cu ft (5.7 kg-kcal/m^3) (84). The high heat value is the heat released during combustion as measured in a calorimeter. However, gas engine efficiencies are usually based on the low heat value, which is the heat value of gas when none of the water vapor formed by combustion has been condensed. By way of comparison, sludge gas containing 70 percent methane and no other combustibles has a low heat value of 640 Btu per cu ft (5.7 kg-kcal/m^3) and a high heat value of 703 Btu per cu ft (6.26 kg-kcal/m^3) (84).

6.2.4.3 Supernatant Quality

Supernatant from an anaerobic digestion system can contain high concentrations of organic material, dissolved and suspended

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3[illegible]st Ashlan Ave.
F[illegible], CA 93726
PHONE: (209) 445-5116
FAX: (209) 445-5910

10 September 1996

J.R. Wood, Inc.
P.O. Box 545
7916 West Bellevue Road
Atwater, CA 95301

CERTIFIED MAIL
P 846 404 467

TRANSMITTAL OF ADOPTED/AMENDED WASTE DISCHARGE REQUIREMENTS

Enclosed is an official copy of Order No. 96-213 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its last regular meeting.

LARRY W. BEATTY
Senior Engineer
RCE No. 15205

LML:fmc

Enclosures: Adopted Order
Standard Provisions

cc: Mr. John Youngerman, Division of Water Quality, State Water Resources Control Board, Sacramento
Department of Health Services, Office of Drinking Water, Fresno
Department of Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Merced County Environmental Health Department, Merced
Merced County Planning Department, Merced
Concerned Neighbors of J.R. Wood, Inc., Winton

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 96-213

WASTE DISCHARGE REQUIREMENTS
FOR
J. R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. J. R. Wood, Inc., (hereafter Discharger), a California corporation, submitted a Report of Waste Discharge (RWD) on 5 June 1995, and supplemental information on 18 October 1995, 6 February, 25 March, and 5 April 1996. The RWD describes a proposed increase in the discharge of wastes from its existing frozen food plant (FFP) and an accompanying expansion of process wastewater treatment and disposal facilities (WWTF). The FFP is at 7916 West Bellevue Road, Atwater. The property, of approximately 350 acres (Assessor's Parcel Nos. 143-25-09, 150-030-33, 150-030-15, 150-030-34, 150-030-35, 150-030-36, 150-030-37, 50-320-11, 56-025-19, 56-010-30, 56-010-31, and 56-010-31), is owned by the Discharger.

2. The RWD describes WWTF improvements for a proposed discharge flow increase resulting from relocation of substantial processing operations from similar plants in Sanger and Escalon owned and operated by the Discharger. The WWTF improvements include an increase in treatment capacity through additional treatment pond aeration and an increase in disposal capacity through the aquisition of an additional 37 acres for effluent disposal. Domestic sanitary wastes from FFP restrooms will continue to be discharged to an on-site septic tank and leachfield system that is regulated by Merced County and not this Order.

3. The existing FFP processes apricots, cantaloupes, melons, peaches, strawberries, and carrots. The Discharger was first issued Waste Discharge Requirements (WDRs) for the waste discharge from this FFP in 1976.

4. Waste Discharge Requirements Order No. 89-110, adopted by the Board on 23 June 1989, prescribes requirements for a discharge of a daily maximum and monthly average flow of 0.50 and 0.33 mgd, respectively, of food processing wastewater.

Due to continued odor problems through 1989 and lack of clear indications that the WWTF improvements were completed to adequately handle continual FFP expansions, Cease and Desist Order No. 81-003 remains in effect.

5. Order No. 89-110 must be revised to reflect the flow increase, an addition of disposal acreage (37 acres) from newly aquired property, and to incorporate current plans and policies of the Board..

6. The RWD reports that the discharge from the WWTF will be increased to monthly average maximum, maximum daily, and average annual flows of 0.94 mgd, 1.50 mgd, and 0.37 mgd, respectively. The maximum annual discharge is 143.6 million gallons. The projected wastewater flows and characteristics following treatment vary monthly depending on the produce that is processed and climactic factors, as shown below:

Month	Flow MG[1]	TFDS[2] mg/l	BOD_5[3] mg/l	N mg/l
Jan	≤4.9	427	162	0.9
Feb	≤4.1	298	476	0.9
Mar	≤3.8	573	152	0.8
Apr	≤6.3	540	312	5.4
May	≤7.4	768	541	1.0
Jun	≤15.0	435	652	10.5
Jul	≤24.0	461	1,910	23.9
Aug	≤23.0	830	2,789	61.0
Sep	≤22.0	917	2,569	75.5
Oct	≤12.8	793	1,318	49.2
Nov	≤12.3	469	837	53.7
Dec	≤8.0	539	528	11.2
Average	≤12.0	638	1,511	36.4

[1] Million gallons

[2] Total fixed dissolved solids

[3] 5-day, 20° Celsius biochemical oxygen demand. Projected monthly BOD_5 concentrations following treatment represent a 30-81 % reduction from untreated wastewater concentrations.

The pH of the effluent averages 7.43 pH units. Anhydrous ammonia is added to the anaerobic digester treatment unit to control pH and provide a source of nitrogen.

7. Treatment at the WWTF consists of parallel 0.030 inch and 0.040 inch mesh screens , an in-ground covered anaerobic digester, and 3 mechanically aerated treatment ponds connected in series. Screened solids are hauled off-site for use as animal feed. Treated wastewater is stored in 2 storage ponds where it is mechanically aerated to ensure adequate dissolved oxygen levels for odor control prior to being used to irrigate 290 acres of orchard, vine, and forage crops. The discharge supplies only approximately one-half of the crop water needs, so must be supplemented with on-site well and canal water. The disposal area consists of 141 acres of sudan grass and oats (one crop each), 14 acres of grapes, and 135 acres of peaches. Pond storage will be provided to accommodate rainfall from a 25-year annual rainfall season. The storage ponds allow the Discharger to apply the wastewater during periods of irrigation demand, thereby reducing peak organic loading as described in Finding Nos. 8 and 9.

8. Based on projected applied wastewater, monthly average total nitrogen concentrations, projected monthly average discharge flows, and crop acreage utilized for waste disposal, the projected nitrogen loading rates for the crop areas from wastewater are 213 lb/acre/year, 52 lb/acre/year, and 95 lb/acre/year for sudan grass and oats (one crop each), grapes, and peaches, respectively. These projected nitrogen application rates are less than the annual nitrogen utilization rate for sudan grass and oats (one crop each), grapes, and peaches of 440 lb/acre/year (325 lb/acre/year for sudan grass + 115 lb/acre/year for oats), 125 lb/acre/year, and 95 lb/acre/year, respectively, as established by the California Fertilizer Association.

9. Based on projected monthly BOD concentrations, projected amount of wastewater to be applied to each crop, and respective acreages of the irrigated crops, the maximum BOD loading rates for the sudan grass and oats, grape, and peach reclamation areas are 51 lb/ac/day, 32 lb/ac/day, and 38 lb/ac/day, respectively. These BOD loading rates to the reclamation areas are much less than the 100 lb/ac day maximum allowable loading rate for repeated BOD discharges to land recommended by the U.S. Environmental Protection Agency under typical conditions.

10. Inorganic salts in the wastewater discharge have the potential to migrate through the soil profile and adversely affect underlying ground water. The fixed dissolved solids (FDS) concentration is a measure of the concentration of inorganic salts in the effluent. Based on projected monthly FDS concentrations, projected wastewater application, and

respective acreages of the irrigated crops, the FDS loading rates for the grape, peach, and sudan grass plus oats reclamation areas are 2,221 lb/ac/yr, 2,082 lb/ac/yr, and 3,197 lb/ac/yr respectively. Crops grown and harvested in the reclamation areas will uptake and remove some of the applied salts. U.C. Davis research staff estimates crop salt uptakes for peaches, grapes, and sudan grass plus oats are 408 lb/acre/yr, 239 lb/acre/yr, and 1260 lb/ac/ yr, respectively. The resulting estimated FDS loading rates are less than the excess salt application presently allowed for dairies of 2025 lbs salt/ac/yr.

11. The FFP is in Sections 34 and 35, T16S, R12E, MDB&M, and Sections 2 and 3, T17S, R12 E, MDB&M, as shown in Attachment A, attached hereto and part of this Order by reference. The site lies within the Merced Hydrologic Area (No. 535.80), as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The site drains to the San Joaquin Valley floor.

12. There are many domestic and agricultural supply wells in the vicinity of the FFP. The ROWD reports that the current depth to ground water is greater than 50 feet. Ground water is of excellent mineral quality with an EC of approximately 200 μmhos/cm.

13. Soils in the area are Atwater sands that exhibit rapid permeability when uncompacted. Double ring infiltration tests conducted on compacted soils in the bottom of the storage ponds during construction document infiltration rates of 5×10^{-5} cm/sec to 1.7×10^{-5} cm/sec.

14. Prevailing winds during the summer are from the north to northwest, when irrigation with treated wastewater is highest. The surrounding area is agricultural and includes several residences within 1/4-mile of the FFP. A few of these residences are to the south and southeast and downwind of the 37-acre parcel.

15. On 26 July 1995, Merced County adopted an administrative permit for the construction of cold storage facilities associated with the plant expansion, and no special restrictions were placed on the waste discharge to land.

16. The Board adopted a Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin, Third Edition, (Basin Plan) which designates beneficial uses and contains water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

17. The beneficial uses of underlying ground water are domestic, industrial, and agricultural supply.

18. This proposed discharge of wastewater to land is exempt from Title 23, California Code of Regulations (CCR), Section 2510, et seq., (hereafter Chapter 15) requirements because the Board is issuing waste discharge requirements; the Discharger is complying with the Basin Plan by implementation of best management practices, and the discharge does not need to be managed as a hazardous waste pursuant to Title 22 CCR.

19. On 9 August 1996, the Board adopted a Negative Declaration for this project in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et seq.) and the State CEQA Guidelines. Compliance with this Order will prevent any significant adverse impact on water quality.

20. The permitted discharge is consistent with the antidegradation provisions of State Water Resources Control Board Resolution No. 68-16. The cropland will remove nutrients contained in the wastewater, thus minimizing impacts on water quality. The discharge is a beneficial reuse of wastewater and reduces the demand on ground and surface waters for crop irrigation. The expanded food processing capacity of the FFP increases the economic base of the local economy and therefore is considered to be a benefit to the people of the state.

21. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

22. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that J.R. Wood, Inc., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder at the Atwater Frozen Food Plant, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

2. Bypass or overflow of untreated or partially treated waste is prohibited.

3. Discharge of wastes to land areas within 50 feet of residential properties is prohibited.

4. Discharge of wastes other than frozen food processing wastewaters is prohibited.

5. Discharge of waste classified as 'hazardous' or 'designated', as defined in Sections 2521(a) and 2522(a) of Chapter 15, is prohibited.

B. **Discharge Specifications**

1. The discharge shall not exceed a maximum daily flow of 1.5 mgd or a monthly average flow of 0.94 mgd.

2. The annual discharge shall not exceed 144 million gallons.

3. The discharge shall not create conditions that result in objectionable odors perceivable beyond the limits of the wastewater treatment and disposal areas.

4. Effluent disposal pipelines shall be flushed to remove stagnant water that may result in violation of Discharge Specification B.3, above.

5. The dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/l.

6. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and rainfall from a 25-year annual rainfall season. Freeboard shall never be less than 2 feet (measured vertically).

7. Collected screenings, sludges, and other solids removed from liquid wastes shall be recycled or disposed of in a manner that is consistent with Chapter 15 and approved by the Executive Officer.

C. **Wastewater Reclamation Specifications**

1. Wastewater used for irrigation shall be managed to minimize erosion, runoff, and movement of aerosols from the disposal areas.

2. Areas irrigated with wastewater shall be managed to prevent breeding of mosquitos. More specifically:

   a. Tail water must be returned and all water must infiltrate completely within 48 hours after application.

   b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.

   c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitos shall not be used to store wastewater.

3. The perimeter of the disposal areas shall be graded to prevent ponding along public roads or public areas.

4. The resulting effect of the discharge on soil pH shall be such as to not exceed the buffering capacity of the soil profile (See Provision E.3 for a compliance schedule.)

5. Organic loading on the disposal area shall not exceed environmental conditions or 100 lbs of BOD/acre/day, whichever is less.

6. Application of water and nutrients shall not exceed accepted agronomic rates for the crops grown.

D. Ground Water Limitations

The discharge, in combination with other sources, shall not cause underlying ground water to contain waste constituents in concentrations statistically greater than background water quality.

E. Provisions

1. The Discharger shall comply with Monitoring and Reporting Program No. 96-213, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

2. The Discharger shall comply with all items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision (s)."

3. Prior to 9 August 1997, the Discharger shall submit a technical report to demonstrate whether it complies with Wastewater Reclamation Specification C.4. The report shall evaluate measured soil characteristics of the disposal area and the composition of the wastestream, and demonstrate that the effect of the discharge on soil pH has not exceeded and will not exceed the buffering capacity of the soil profile (to preclude leaching of soluble metals from soils).

   The report must be prepared under the direction of a California registered civil engineer or agricultural engineer with experience in industrial wastewater disposal. All reports are subject to the review and approval of the Executive Officer.

4. In the event of any change in control or ownership of land or waste discharge facilities described herein, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

   To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

5. The Discharger shall use the best practicable control techniques currently available to comply with this Order.

6. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer.

Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

7. A copy of this Order shall be kept at the Atwater FFP for reference by personnel responsible for wastewater who shall be familiar with its contents.

8. The Board will review this Order periodically and will revise requirements when necessary.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 August 1996

WILLIAM H. CROOKS, Executive Officer

LML:lml/fmc

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 96-213
FOR
J. R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

INFLUENT MONITORING

Influent samples shall be representative of the volume and nature of the discharge. The following is the influent monitoring program.

Constituent	Units	Type of Sample	Frequency
Flow	mgd	Continuous	Daily

POND MONITORING

Constituent	Units	Type of Sample	Frequency
Freeboard	feet	Measured	Weekly
Dissolved Oxygen	mg/l	Grab[1]	Weekly
Sludge Depth	inches	Grab	Annually

[1] Grab samples shall be obtained between the hours of 0800 and 0900 at a depth of 1-foot below the pond surface.

In conducting the pond monitoring, a log shall be kept of the pond conditions. The presence or absence of the following conditions shall be documented:

- floating or suspended matter
- odors

Any significant changes in pond operation shall be detailed.

EFFLUENT MONITORING

Effluent samples shall be collected just prior to discharge to the disposal area and should be representative of the volume and nature of the discharge. The following is the effluent monitoring program:

Constituent	Units	Type of Sample	Frequency
pH	pH units	Grab	Weekly
BOD_5[1]	mg/l	Grab	Weekly
Electrical Conductivity	μmhos/cm	Grab	Weekly
Total Dissolved Solids[2]	mg/l	Grab	Monthly
Nitrate Nitrogen	mg/l	Grab	Monthly
Kjeldahl Nitrogen	mg/l	Grab	Monthly
Total Nitrogen	mg/l	Grab	Monthly

[1] Five-day 20° Celsius biochemical oxygen demand.
[2] Determined by EPA Methods 160.1 and 160.4.

DISPOSAL SITE MONITORING

The following comprises the disposal site monitoring program:

a. The area of land (acreage of each crop, total acreage and location of each crop area) utilized for discharge of the waste stream shall be reported monthly.

b. Three representative locations shall be established for soil profile sampling of the disposal site. Two of these shall be within the disposal site, and one shall be outside to represent background conditions. The following is the disposal site monitoring program:

Constituent	Units	Type of Sample	Frequency
Nitrate-Nitrogen	mg/kg	6 feet[1]	Yearly[2]
Kjeldahl-Nitrogen	mg/kg	6 feet[1]	Yearly[2]
Total Nitrogen	mg/kg	6 feet[1]	Yearly[2]
pH	pH units	6 feet[1]	Yearly[2]

[1] Samples shall be taken at 2-foot depth increments.

[2] Each location shall be sampled in either the month of May or June.

GROUND WATER MONITORING

By **9 November 1996**, the Discharger shall submit a work plan for a ground water monitoring network with a schedule for implementation, in or near all areas where the wastewater is disposed of by the Discharger. The monitoring network shall consist of one or more background monitoring wells and sufficient downgradient wells to determine flow direction and gradient, and to monitor disposal areas. All well locations and construction features are subject to the prior approval of the Executive Officer and must be sufficient to monitor potential impacts of the disposal operation on the uppermost ground water aquifer. Existing wells proposed for inclusion in the program shall have known construction features (depth, length of perforated interval, surface seal, etc.). Wells shall be perforated in only the upper portion of the aquifer and shall comply with standards for construction and installation of monitoring wells in accordance with *California Well Standards, Bulletins 74-81 and 74-90*, prepared by the California Department of Water Resources. **Within 30 days following approval** of the workplan by the Executive Officer, the discharger shall implement the proposed ground water monitoring well network.

Samples shall be taken monthly from approved background monitoring well(s) for one year and analyzed for the parameters specified below. Data from these analyses shall be reported to the Board **within 30 days after said year ends**, for use in determining water quality protection standards.

MONITORING AND REPORTING PROGRAM
J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

If subsequent sampling of the background monitoring well(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste disposal activities, the discharger may request modification of the water quality protection standards.

The downgradient wells shall constitute "points of compliance" (POCs). In conjunction with background monitoring, monitoring of POCs will enable one to determine compliance with water quality protection standards. This information shall be displayed on a water flow net diagram for the site. Water samples shall be collected from wells in the approved monitoring network and analyzed as follows:

Constituent	Units	Type of Sample	Sampling Frequency
Depth	feet[1]	measurement	Monthly
Minerals[2]	mg/l	Grab	Annually
Electrical Conductivity	μmhos/cm	Grab	Annually
pH	pH units	Grab	Annually
Total Dissolved Solids[3]	mg/l	Grab	Monthly

[1] The Discharger shall report ground water levels as elevations with respect to mean sea level as well as depth below ground surface.

[2] Mineral analyses shall include calcium, carbonate, chloride, fluoride, iron, magnesium, nitrate, potassium, sodium, sulfate, and total phosphorous.

[3] Determined by EPA methods 160.1 and 160.4.

Following each sampling event (after establishment of water quality protection standards), the Discharger shall determine whether there is a statistically significant increase over water quality protection standards for each paramenter and constituent analyzed. If the Discharger or the Board finds there is a statistically significant increase in indicator paramenters or waste constituents over the water quality protection standards at the POCs, the discharger shall notify the Board, or acknowledge the Board's findings, and submit, **within 90 days**, either a technical report with a plan and time schedule for implementing a verification monitoring program or a report demonstrating water quality protection standards have been exceeded and assess the horizontal and vertical extent of the impact.

If the Discharger, through a verification monitoring program, or the Board verifies that water quality protection standards have been exceeded at or beyond the POCs, the Discharger shall notify the Board, or acknowledge the Board's findings, and submit a technical report within 90 days. The report must contain a plan and time schedule for implementing a corrective action program designed to achieve compliance with water quality protection standards.

REPORTING

Monthly monitoring reports shall include the results of influent monitoring, pond monitoring, effluent monitoring, disposal site monitoring, and ground water monitoring taken monthly or more frequently. Monthly monitoring reports shall be submitted to the Board by the 20th day of the following month. Quarterly and annual monitoring results shall be submitted by the 20th day of the month following each calendar quarter and year, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the consituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly whether the Discharger complies with waste discharge requirements, including calculation of all averages, etc.

If the discharger monitors any pollutant at the locations desigated herein more frequently than is required by this Order, the results of such monitoring shall be included in the discharge monitoring report.

The Discharger may also be requested to submit an annual report to the Board with tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

By 31 January of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names and telephone numbers of persons to contact regarding emergency and routine situations concerning this permit.

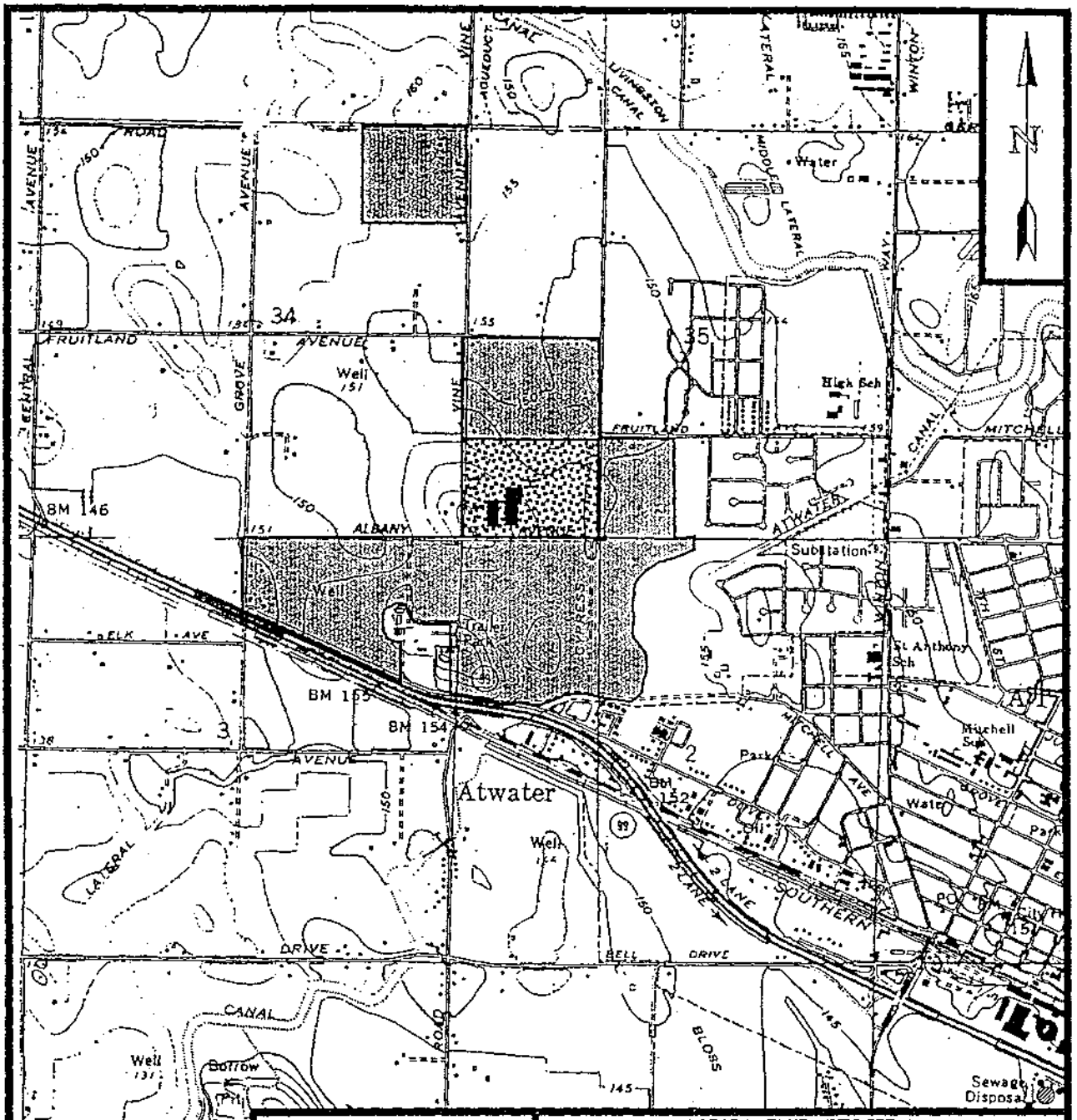
b. A certified statement of when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who did the calibration (Standard Provision C.4).

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision B.3. The Discharger shall implement the above monitoring program on the first day of the month following the effective date of this Order.

Ordered by: _____
WILLIAM H. CROOKS, Executive Officer

9 August 1996
(Date)

LML:fmc



LEGEND

Plant Area

Reclamation Areas

ATTACHMENT A

Vicinity Map

J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

Secs. 34, 35, T16S, R12E, MDB&M and
Secs. 2, 3, T17S, R12E, MDB&M
Arena, Atwater, Cressey and Winton USGS Quads
Scale: 1" = 2000'

INFORMATION SHEET

J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

J.R. Wood, Inc. (hereafter Discharger) submitted a complete Report of Waste Discharge (RWD) in March 1996 to reflect a proposed flow increase and addition of disposal acreage (37 acres) from newly aquired property at its Atwater frozen food plant (FFP). The total property of approximately 350 acres is owned by the Discharger.

The FFP processes apricots, cantaloupes, melons, peaches, strawberries, and carrots. The Discharger proposes to increase flows to monthly average maximum, maximum daily, and average annual discharges of 0.94 mgd, 1.50 mgd, and 0.37 mgd, respectively, of food processing wastewater. The projected wastewater characteristics and flows vary monthly depending on the produce that is processed. The RWD reports the treated wastewater as having chemical constituent concentrations of total fixed dissolved solids, BOD, and nitrogen of 298 to 917 mg/l, 162 to 2,789 mg/l, and 0.8 to 75.5 mg/l, respectively. The wastewater characteristics described in the Initial Study and Negative Declaration for the proposed expanded discharge apply to untreated wastewater.

Process wastewater is screened, digested anaerobically, aerated in ponds, and stored in holding ponds prior to being used for irrigation of 290 acres of orchard, vine, and forage crops. The discharge supplies approximately one half of the crop water needs, and therefore is supplemented with on-site well and canal water. The disposal area consists of 141 acres of sudan grass and oats (one crop each), 14 acres of grapes, and 135 acres of peaches. Pond storage will be provided to accommodate a 25-year annual rainfall season. Double ring infiltration tests were conducted on compacted soils in the bottom of the storage ponds during construction and show infiltration rates of 5×10^{-5} cm/sec to 1.7×10^{-5} cm/sec.

Based on projected applied wastewater, monthly average total nitrogen concentrations, projected monthly average discharge flows, and crop acreage utilized for waste disposal, the projected nitrogen loading rates for the crop areas are 213 lb/acre/year, 52 lb/acre/year, and 95 lb/acre/year for sudan grass and oats (one crop each), grapes, and peaches, respectively. These projected nitrogen application rates are less than the annual nitrogen utilization rate for sudan grass and oats (one crop each), grapes, and peaches of 440 lb/acre/year (325 lb/acre/year for sudan grass + 115 lb/acre/year for oats), 125 lb/acre/year, and 95 lb/acre/year, respectively, as established by the California Fertilizer Association.

J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

Based on projected monthly BOD concentrations, projected amount of wastewater to be applied to each crop, and respective acreages of the irrigated crops, the maximum BOD loading rates for the sudan grass and oats, grape, and peach reclamation areas are 51 lb/ac/day, 32 lb/ac/day, and 38 lb/ac/day, respectively. These BOD loading rates to the reuse areas are much less than the 100 lb/ac/day recommended maximum loading rate for repeated BOD application to landby the U.S. Environmental Protection Agency under typical conditions.

Inorganic salts in the wastewater discharge have the potential to migrate through the soil profile and adversely affect underlying ground water. The fixed dissolved solids (FDS) concentration is a measure of the inorganic salts in the effluent. Based on projected monthly FDS concentrations, projected wastewater application, and respective acreages of the irrigated crops, the FDS loading rates for the grape, peach, and sudan grass plus oats reclamation areas are, 2,221 lb/ac/yr, 2,082 lb/ac/yr, and 3,197 lb/ac/yr respectively. Crops grown and harvested in the reclamation areas will uptake and remove some of the applied salts. U.C. Davis research staff estimates crop salt uptakes for peaches, grapes, and sudan grass plus oats are 408 lb/acre/yr, 239 lb/acre/yr, and 1260 lb/ac/ yr, respectively. The resulting estimated FDS loading rates are less than the excess salt application presently allowed by the Board for dairies of 2025 lbs salt/ac/yr.

There are many domestic and agricultural supply wells in the vicinity of the FFP. The RWD reports that the current depth to ground water is greater than 50 feet. Ground water is of excellent mineral quality, with an EC of approximately 200μmhos/cm.

The site drains to the San Joaquin Valley floor.

On 9 August 1996, the Board adopted a Negative Declaration for this project in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et seq.) and the State CEQA Guidelines. Compliance with this Order will prevent any significant adverse impact on water quality.

LML:lml/fmc:8/09/96

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3614 East Ashlan Ave.
Fresno, CA 93726
PHONE: (209) 445-5116
FAX: (209) 445-5910

10 September 1996

J.R. Wood, Inc.
P.O. Box 545
7916 West Bellevue Road
Atwater, CA 95301

CERTIFIED MAIL
P 846 404 468

TRANSMITTAL OF ADOPTED RESOLUTION FOR J.R. WOOD, INC., ATWATER FROZEN FOOD PLANT, MERCED COUNTY

Enclosed is an official copy of Resolution No. 96-212 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its last regular meeting.

LARRY W. BEATTY
Senior Engineer
RCE No. 15205

LML:fmc

Enclosures: Adopted Order
Standard Provisions

cc: Mr. John Youngerman, Division of Water Quality, State Water Resources Control Board, Sacramento
Department of Health Services, Office of Drinking Water, Fresno
Department of Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Merced County Environmental Health Department, Merced
Merced County Planning Department, Merced
Concerned Neighbors of J.R. Wood, Inc., Winton

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. 96-212

APPROVING THE INITIAL STUDY
AND NEGATIVE DECLARATION
FOR
J.R. WOOD, INC.
ATWATER FROZEN FOOD PLANT
MERCED COUNTY

WHEREAS, on 5 June 1995, J.R. Wood, Inc., submitted a Report of Waste Discharge to the California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) for an increase in the discharge and disposal area for frozen food processing waste to a daily maximum and monthly average maximum discharge of 1.50 mgd and 0.94 mgd, respectively, to 290 acres of land; and

WHEREAS, the Board assumed the lead agency role for this project under the California Environmental Quality Act and conducted an Initial Study in accordance with Title 14, California Code of Regulations, Section 15063, entititled "Guidelines for the implementation of the California Environmental Quality Act"; and

WHEREAS, mitigation measures included in the project and identified in the Negative Declaration are expected to mitigate all potential environmental impacts, including impacts on water quality, to a less than significant level; and

WHEREAS, copies of the Initial Study and proposed Negative Declaration were transmitted to all agencies and persons known to be interested in this matter; and

WHEREAS, comments received have been addressed; and

WHEREAS, the Board considered all testimony and evidence at a public hearing held on 9 August in Sacramento, California, and good cause was found to approve the Initial Study and adopt a Negative Declaration; Therefore, be it

RESOLVED, that the California Regional Water Quality Control Board, Central Valley Region. approves the Initial Study and Negative Declaration for J.R. Wood, Inc, Atwater Frozen Food Plant, Merced County.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on 9 August 1996.

William H. Crooks

WILLIAM H. CROOKS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3614 East Ashlan Ave.
Fresno, CA 93726
PHONE: (209) 445-5116
FAX: (209) 445-5910

SEP 13 1996

12 September 1996

To Davis

Mr. Jim Wood, President
J.R. Wood, Inc.
7916 Bellevue Rd.
P.O. Box 545
Atwater, CA 95301

TRANSMITTAL OF ADOPTED RESCISSION ORDER NO. 96-189, RESCINDING CEASE AND DESIST ORDER NO. 81-033, AND NOTIFICATION OF RESCISSION OF CLEAN-UP AND ABATEMENT ORDER NO. 78-LSO-01, J.R. WOOD, INC., FROZEN FOODS OPERATION, MERCED COUNTY

Enclosed is an official copy of Order No. 96-189 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its 8 August 1996 meeting.

Also, because of your recent improvements to the wastewater treatment and disposal facilities, the threat of nuisance conditions originally identified in Clean-up and Abatement Order No. 78-LSO-01 has been eliminated. Based on these improvements, Order No. 78-LSO-01 is hereby rescinded.

WILLIAM H. CROOKS, Executive Officer

by: _____
LOREN J. HARLOW, Assistant Executive Officer

LML:lml/fmc

Enclosure: Adopted Order

cc: Department of Health Services, Office of Drinking Water, Fresno
Department of Fish and Game, Region IV, Fresno
Department of Water Resources, San Joaquin District, Fresno
Merced County Environmental Health Services Department, Merced
Merced County Planning Department, Merced

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 96-189

RESCISSION OF CEASE AND DESIST ORDER NO. 81-033
FOR
J.R. WOOD, INC.
FROZEN FOODS OPERATIONS
MERCED COUNTY

The California Regional Water Quality Control Board, Central Valley Region (hereafter Board), finds that:

1. The Board adopted Cease and Desist Order No. 81-033 on 27 February 1981 against J.R. Wood, Inc., Frozen Foods Operations (hereafter Discharger), directing the company to comply with Waste Discharge Specifications A.1 and A.8.c of Waste Discharge Requirements Order No. 79-158.

2. The Discharger has achieved compliance with the Cease and Desist Order.

3. The issuance of this Order is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Section 15321(a)(2), Title 14, California Code of Regulations.

4. The Board, on 8 August 1996, held a hearing and considered all evidence on this matter.

IT IS HEREBY ORDERED that Cease and Desist Order No. 81-033 is rescinded.

I, WILLIAM H.CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 8 August 1996.

William H. Crooks

WILLIAM H. CROOKS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

3614 E. Ashlan Avenue
Fresno, CA 93726
Phone (209) 445-5116
FAX (209) 445-5910

Cal/EPA

Pete Wilson, *Governor*

15 April 1998

Mrs. Terri Hoff, Research and Development Manager
J.R. Wood, Inc.
P.O. Box 545
Atwater, CA 95301

GROUNDWATER MONITORING WELL LOCATIONS AND WELL DESIGN APPROVAL

We have reviewed your January 1998 report, *Study of Groundwater Monitoring Well Locations* that describes the proposed locations and construction design of three groundwater monitoring wells at the J.R. Wood, Inc. Atwater Frozen Food Plant (Plant). The Plant's Waste Discharge Requirements (WDRs) Order No. 96-213 requires you to install a groundwater monitoring network consisting of one or more background monitoring wells and sufficient downgradient wells to determine flow direction and gradient, and to monitor discharge areas.

According to your report, springtime groundwater levels are about 63 feet below ground surface in the vicinity of the Plant and groundwater typically flows east to west. You propose to locate one upgradient well on the eastern-most edge of the Plant's property, and position two downgradient wells to maximize the catch of groundwater flowing under reclamation areas. The monitoring wells will be from about 80 feet to about 100 feet deep and have sanitary seals extending down from the ground surface to the uppermost aquifer.

We find that the proposed locations and design of your three groundwater monitoring wells should provide sufficient background and downgradient groundwater data to monitor the potential impacts of the Plant's wastewater disposal operation on the uppermost groundwater aquifer. We therefore approve your workplan. According to the Plant's WDRs, J.R. Wood shall implement the proposed groundwater monitoring network by **15 May 1998.**

We may require that you install additional monitoring wells if staff determines that the network is insufficient to determine the Plant's impact on underlying groundwater.

If you have any questions, please call Jo Anne Kipps of this office at (209) 445-5145.

BERT E. VAN VORIS
Supervising Engineer
RCE No. 24105

JLK: jlk

cc: California Department of Water Resources, San Joaquin District
California Department of Health Services, Sacramento

7308

J. R. Wood, Inc.

Atwater, California

STUDY OF

GROUNDWATER MONITORING WELL LOCATIONS

January, 1998

ECO:LOGIC Engineering
2220 Douglas Boulevard, Suite 220
Roseville, California 95661

TABLE OF CONTENTS

Purpose

The purpose of this study is to provide the rationale and technical support data for the location of additional groundwater monitoring wells for the J. R. Wood, Inc., food processing wastewater reclamation system located near Atwater, California. The California Regional Water Quality Control Board (hereinafter, Regional Board) has requested that additional groundwater monitoring wells be installed at the J. R. Wood, Inc., system because of its recent expansion.

It is expected that the Regional Board will approve the monitoring well locations and monitoring well design proposed herein. Once approved, J. R. Wood, Inc., will retain a licensed well contractor to construct the monitoring wells to State of California standards (Department of Water Resources [hereinafter, DWR] Bulletin 74-90) under the direct supervision of a licensed engineer or geologist who will file the Well Logs for the monitoring wells with the State.

J. R. Wood, Inc., will report the completion of the monitoring wells to the Regional Board and provide the Regional Board with copies of the Well Logs. J. R. Wood, Inc., will begin monitoring water quality in the wells per the Waste Discharge Requirements as soon as the wells are completed.

Based on approval by the Regional Board, Department of Health Services, and DWR of the groundwater monitoring well locations and design proposed, herein, and on normal rainfall patterns, J. R. Wood, Inc., intends to have the new wells installed and operational by the end of April (i.e., before the onset of the main food processing season).

Background

The J. R. Wood, Inc., facility at Atwater treats its food processing wastewater in aerated treatment ponds (sanitary wastewater is handled by a separate system). The treated food processing wastewater is stored in aerated reservoirs with compacted soil bottoms to limit the loss of stored water by percolation. The stored water is applied to J. R. Wood, Inc., crops at the site at agronomic rates for water and nitrogen. The water is also applied to the crops in compliance with the salt application criteria developed by the Regional Board in its Dairy Guidelines. A layout of the J. R. Wood, Inc., food processing facility and wastewater reclamation area is shown in Figure 1.

Regarding groundwater monitoring, extremely important concepts relative to the J. R. Wood, Inc., operation are that 1) the treated wastewater is applied to the crops at agronomic rates, and 2) virtually all of the land surrounding the J. R. Wood, Inc., facility is in agricultural use and is also irrigated at agronomic rates. Thus, the flux of surface applied irrigation water to underlying groundwater from the J. R. Wood, Inc., facility is very low and about the same as from surrounding ranches. Consequently, there is no reason to think that there is any significant groundwater mound under the J. R. Wood, Inc., facility. Therefore, the groundwater levels and contour lines in and around the J.

R. Wood, Inc., facility are expected to be similar to those measured and modeled annually by DWR.

Groundwater Conditions

Groundwater contour maps developed by DWR for the greater Atwater area for the past 10 years of record (1987-1996) are presented in Appendix A. This span of years includes clusters of "critically dry" and "wet" years, and therefore, should be representative of the groundwater levels and directions of flow that can be expected through the course of such natural events in years to come.

A synopsis of the DWR groundwater data at the J. R. Wood, Inc., facility as to groundwater depth, groundwater flow direction and gradient, and the relative wetness or dryness of the year is presented in Table 1. From this information it can be concluded that:

1. Groundwater flow is typically from east to west with minor variations causing flow to come from ESE to ENE.

2. Groundwater levels have continued to fall in wet years following the critically dry years. The net groundwater level decline has been about 2 feet per year. Spring depths to groundwater are, now, as much as 63 feet. The depth to groundwater is expected to increase over time based on recent groundwater level trends.

3. The groundwater gradient is typically in excess of 1.0 ft/1,000 ft.

4. The use of groundwater by the nearby City of Atwater does not appear to cause a "cone of depression" of groundwater levels of sufficient magnitude to be evident on the DWR maps that would imply the possibility of a groundwater flow reversal from the J. R. Wood, Inc., facility to the east towards Atwater.

In recent years, DWR no longer prepares groundwater maps for Spring and Fall, only Spring. However, DWR has limited Spring and Fall groundwater data for the Atwater area indicating seasonal groundwater falls of as much as 16 feet with a typical value of about 7 feet. This seasonal drop in groundwater level must be considered in setting the depths of the new wells.

Locations of New Wells

Three new monitoring wells are proposed to supplement the existing three "test" wells (see Figure 1). Of the three new wells, one will be an upgradient or "background" well and two will be downgradient wells.

Upgradient Well. The upgradient well should be located on the eastern-most edge of the J. R. Wood, Inc., property away from the possible effects of irrigation canals which may leak. The best location appears to be in J. R. Wood, Inc., property block # 047 (see Figure 2). The well should be located about 900 feet south of Fruitland Avenue and about 150 feet from the eastern property line. This site 1) provides minimum

horizontal separation from possible sources of potential pollution per DWR Bulletin 74-90, 2) keeps the well away from irrigation canals, and 3) is best aligned with Downgradient Well "South" considering the other constraints on locating an upgradient well. The exact location will be determined in the field by J. R. Wood, Inc., staff and the engineer or geologist supervising installation of the well.

Downgradient Wells. The two downgradient wells will be located in J. R. Wood, Inc., property blocks # 093 and #041 in the approximate locations shown in Figure 2. The block # 093 well is located approximately 150 feet east of the Fruitland Lateral canal and approximately 900 feet south of Liberty Avenue. The block # 041 well is located approximately 1,200 feet east of Grove Avenue and 500 feet south of Bellevue Road. These locations maximize the "catch" of water flowing under the J. R. Wood, Inc., reclamation areas based on groundwater flowing from the east and ranging from ESE to ENE (see Figure 2 for estimates of catchment areas). With both wells, the locations will be determined in the field by J. R. Wood, Inc., staff and the engineer or geologist supervising installation of the wells.

Design of New Wells

Based on the current depth to groundwater (60+ feet), the current trend of decline in groundwater levels (2 feet/year), and an annual Spring and Fall temporary groundwater level decline of about 7 feet, the monitoring wells should have a depth of from about 80 feet to about 100 feet to ensure water in the wells throughout the year, and over the life of the wells.

Based on available well logs for the J. R. Wood, Inc., facility site (see Appendix B), a sand stratum occurs from approximately 65 feet deep to approximately 100 feet deep below ground surface (BGS). This stratum appears to be underlain by grey clay and sandy brown clay, and overlain by grey clay.

A sand stratum located at approximately 65 to 100 feet (BGS) may be tapped by domestic water wells in the area. Considering that the J. R. Wood, Inc., monitoring wells will be located in areas where treated food processing wastewater (which should contain only incidental human pathogens, as does typical surface irrigation water) is being reclaimed, it is recommended that the wells have sanitary seals extending down from ground surface to the top of the aforementioned sand stratum. The well screen should terminate at the bottom of the sand stratum. The well casing should include a "nose piece" in which sand can accumulate and be removed periodically by bailing or other techniques. The specifics of the monitoring well design are shown in Figure 3. The larger than typical concrete bases are recommended because the wells are located in a reclamation area. The well casing material and drilling/installation techniques shall be specified by a professional civil engineer with experience in monitoring wells of this depth in similar soils and groundwater conditions. The wells are to be disinfected per the procedures recommended by DWR. The wells are to be constructed per all pertinent standards.

Written approval of the monitoring well locations and design must be received from the Department of Water Resources, Department of Health Services, and Regional Water Quality Control Board prior to installation of these wells.

Table 1

DWR WATER AND GROUNDWATER INFORMATION

Year	DWR Water Year Index (a)	Groundwater Data				
		Elevation, Feet	Depth to, Feet (b)	Flow Direction	Gradient, ft/1,000 ft.	Localized Variability
1987	Critical (c)	113	~42	E to ENE	1.9	Minor
1988	Critical (c)	116	~39	East	1.0	None
1989	Critical (c)	113	~42	ENE to ESE	1.5	Minor
1990	Critical (c)	106	~49	ENE to ESE	1.0	Minor
1991	Critical (c)	103	~52	E to SE	0.9	Minor
1992	Critical (c)	99	~56	East	1.3	None
1993	Wet	93	~62	East	0.5	None
1994	Critical (a)	97	~58	East	0.9	None
1995	Wet	92	~63	East	1.1	None
1996	Wet	94	~61	E to ENE	0.9	Minor

(a) See Appendix C.
(b) Based on a land surface elevation of about 155 feet (MSL).
(c) Critically dry year.

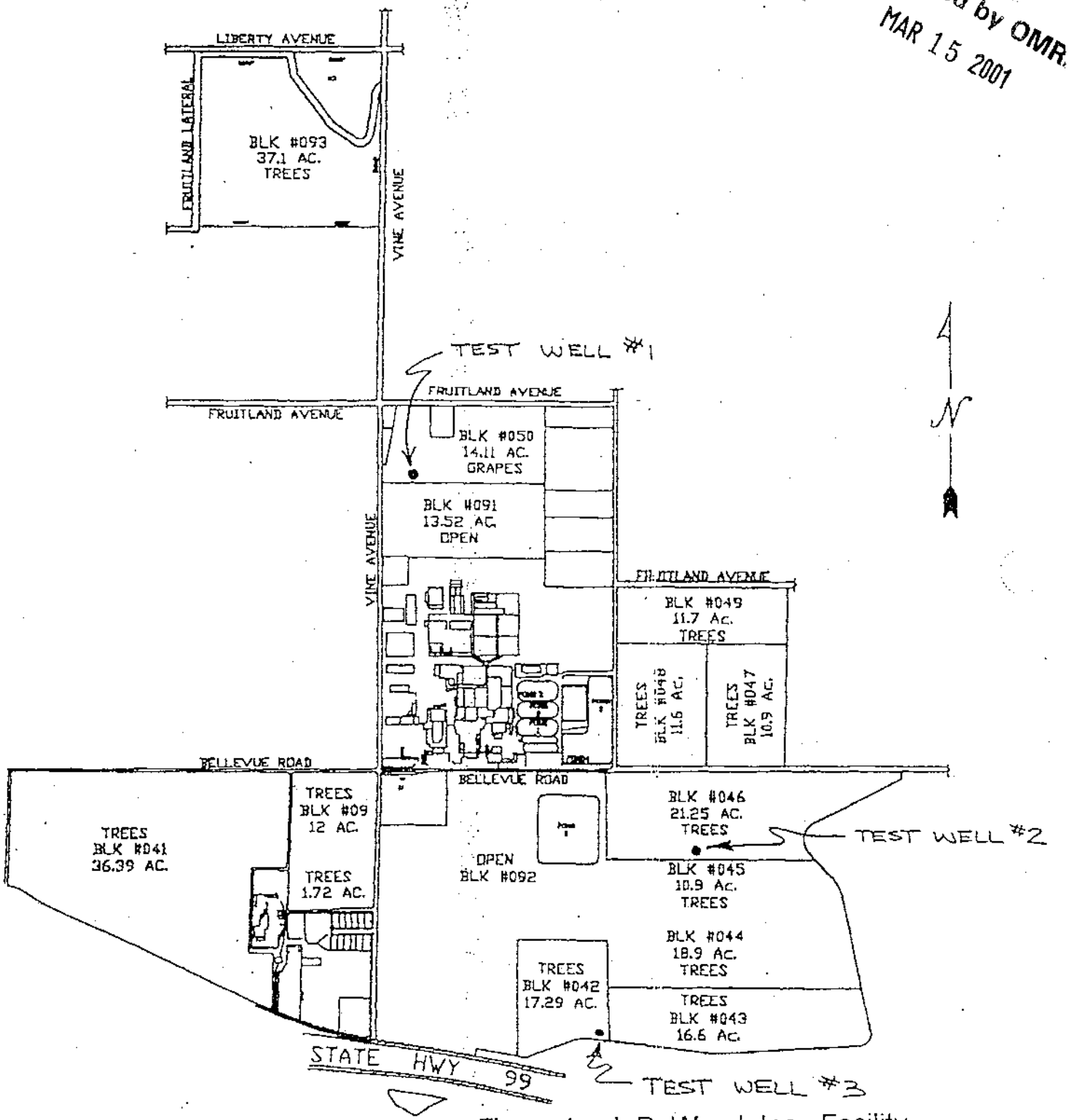


Figure 1 – J. R. Wood, Inc., Facility

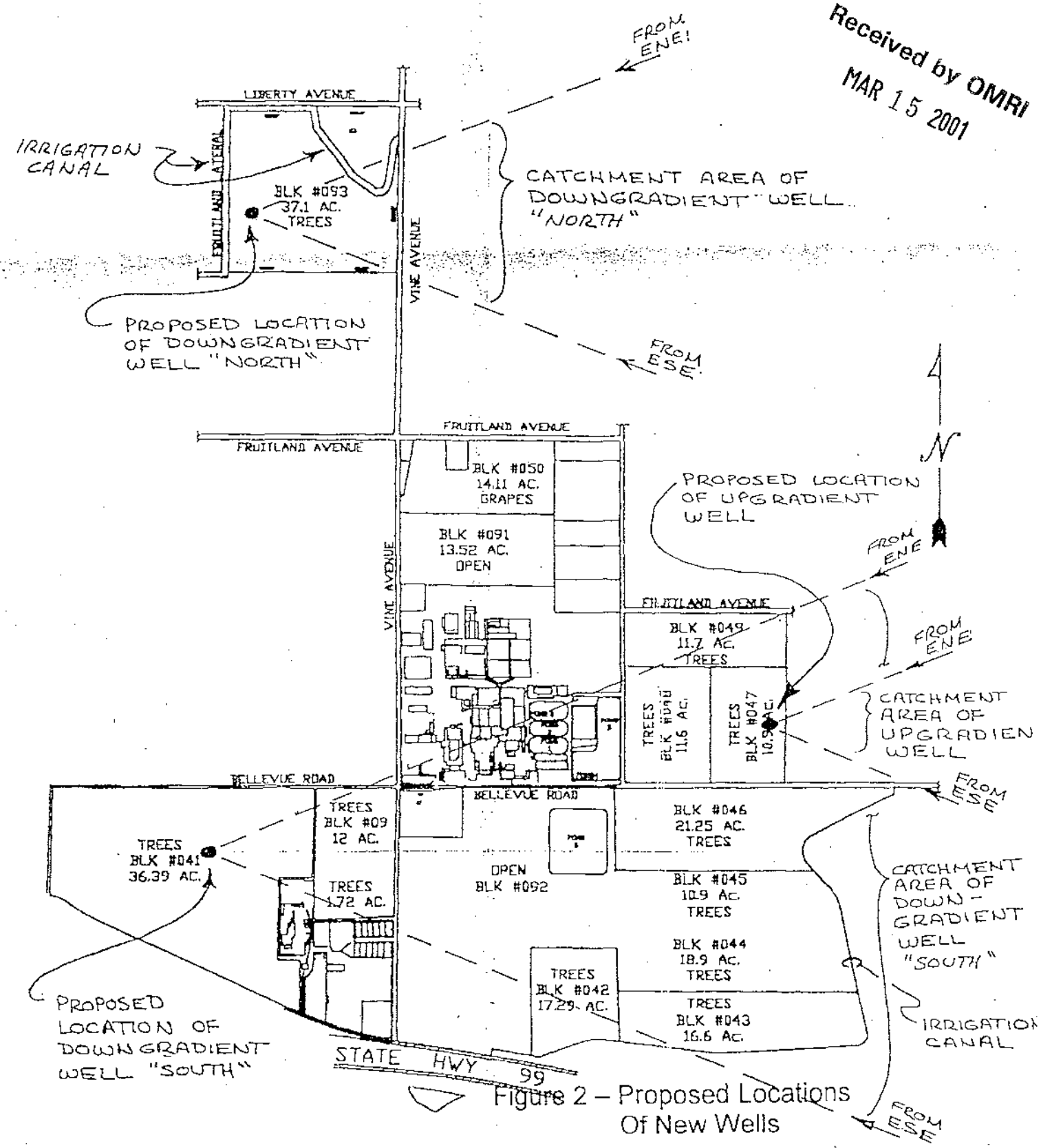
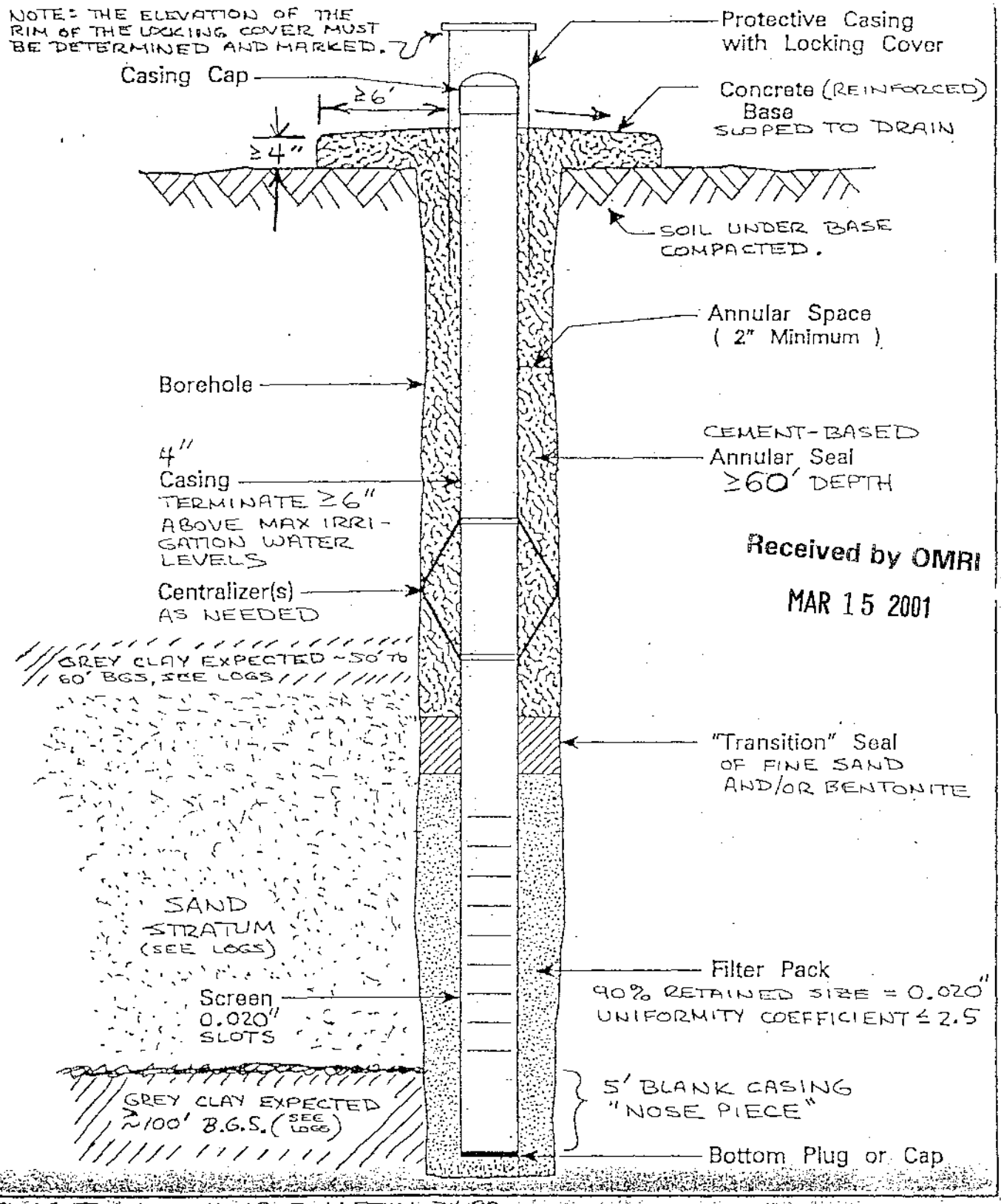


Figure 2 – Proposed Locations Of New Wells

Figure 3. CROSS SECTION OF A TYPICAL MONITORING WELL

(NOTE: Schematic, not to scale)



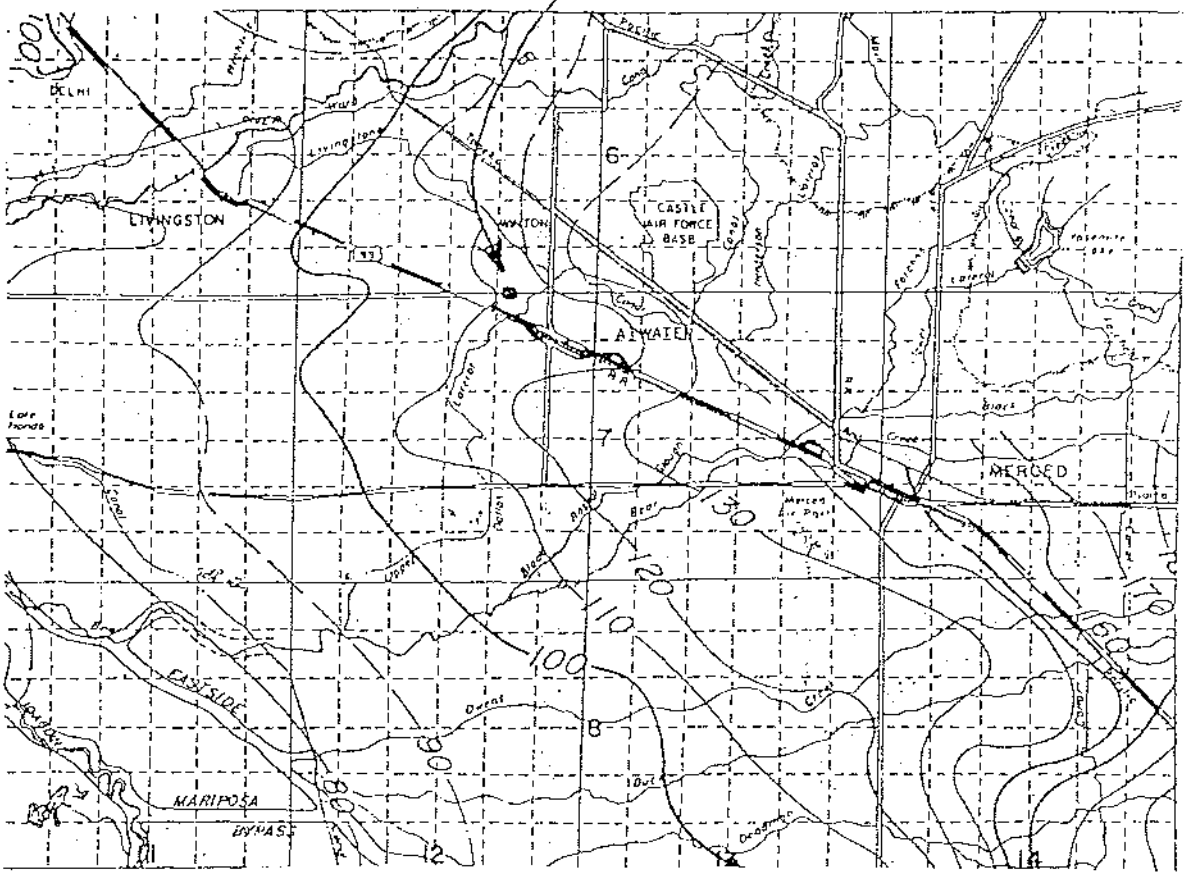
ADAPTED FROM: DWR BULLETIN 74-90

Figure 3 – Proposed Monitoring Well Design

APPENDIX A

DWR Groundwater Data

J.R. WOOD FACILITY
(SO MARKED ON ALL SUBSEQUENT MAPS)

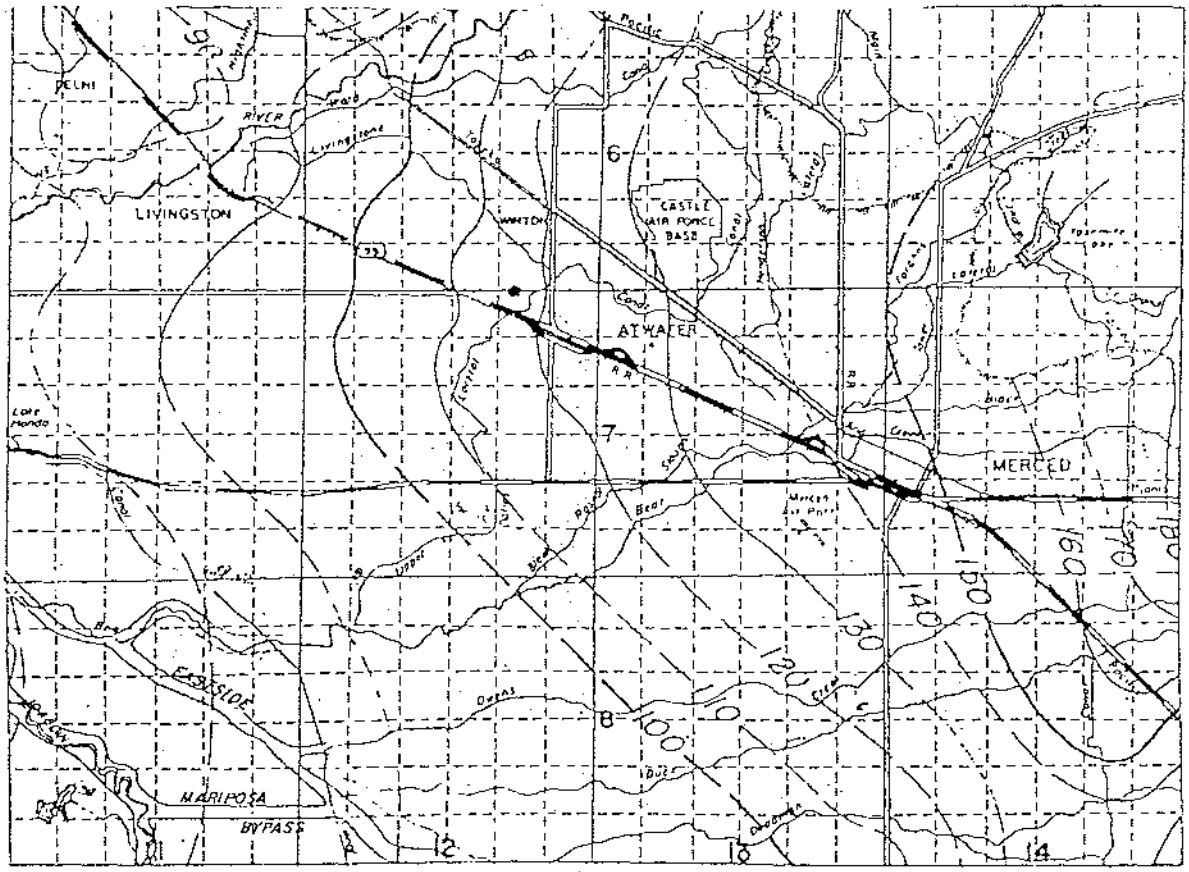


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1987

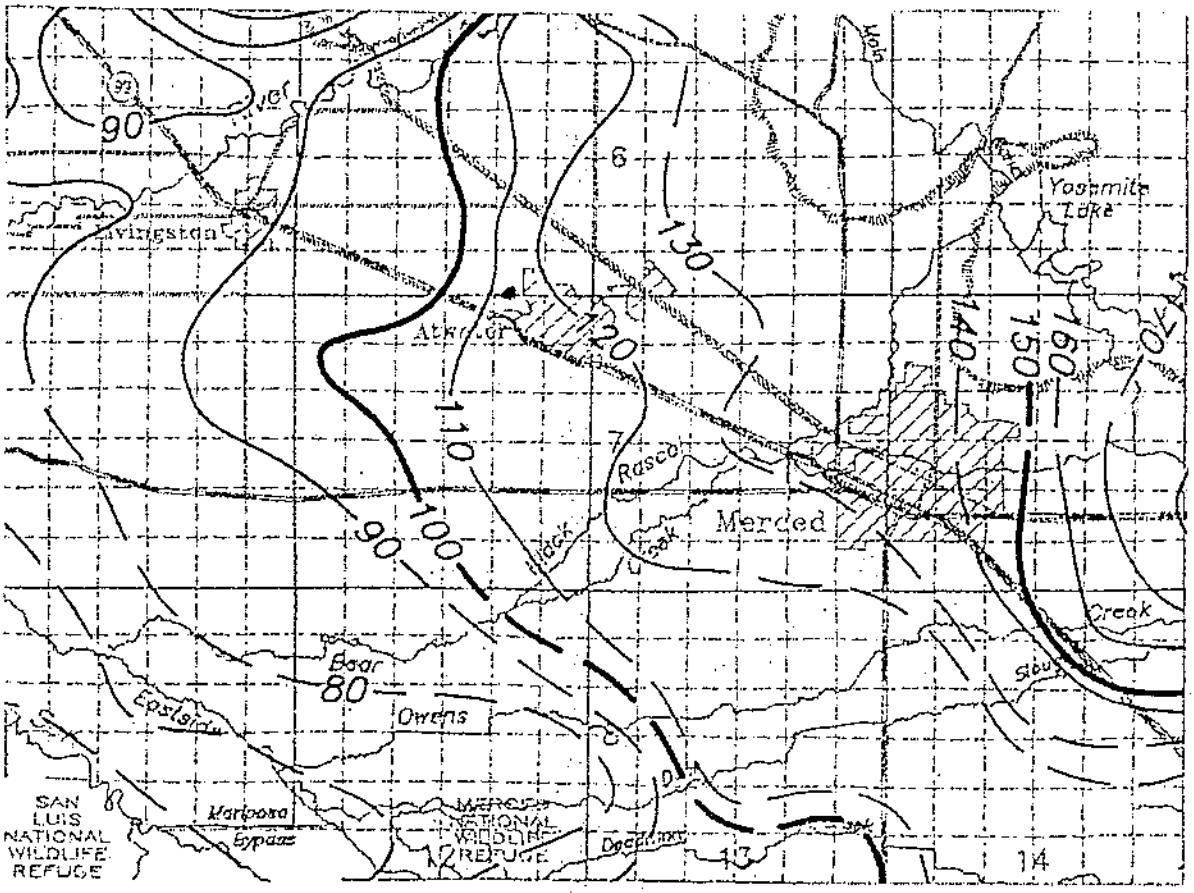


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1988

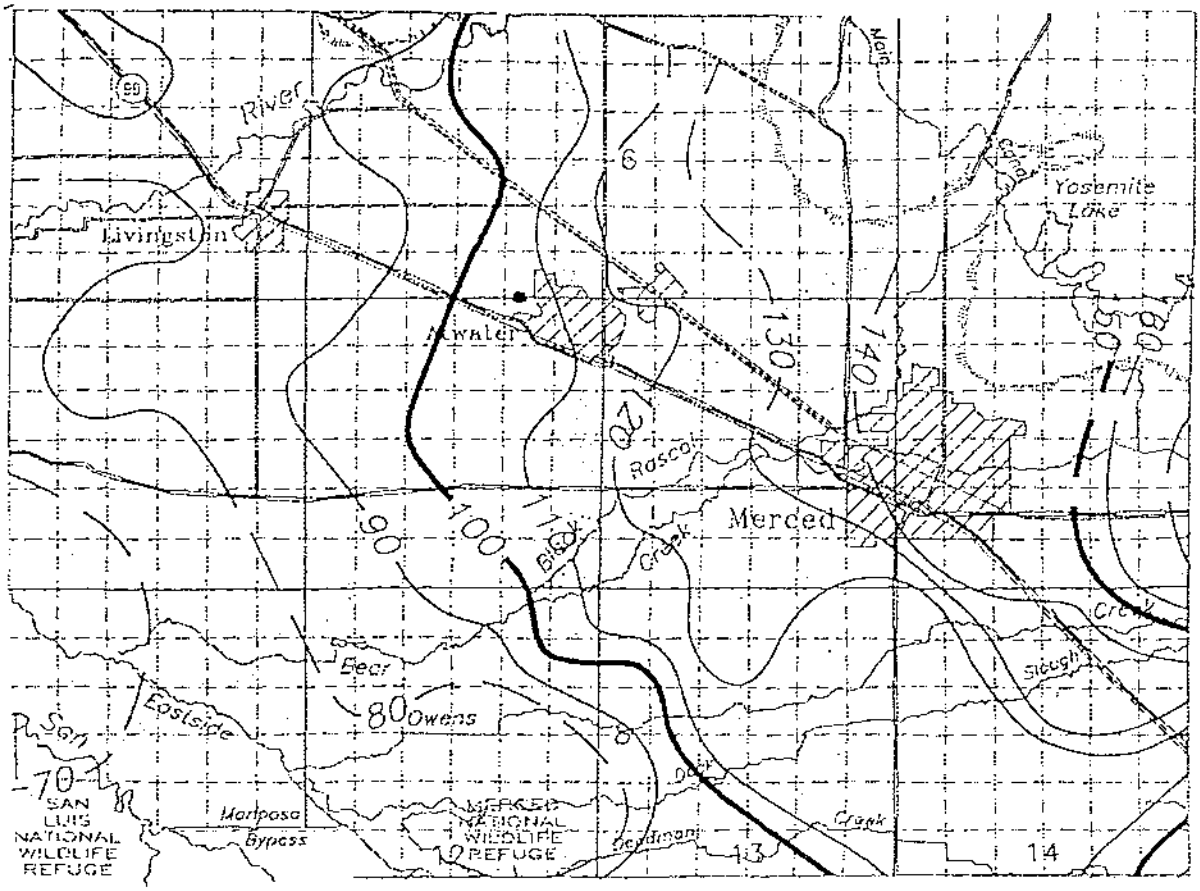


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1989

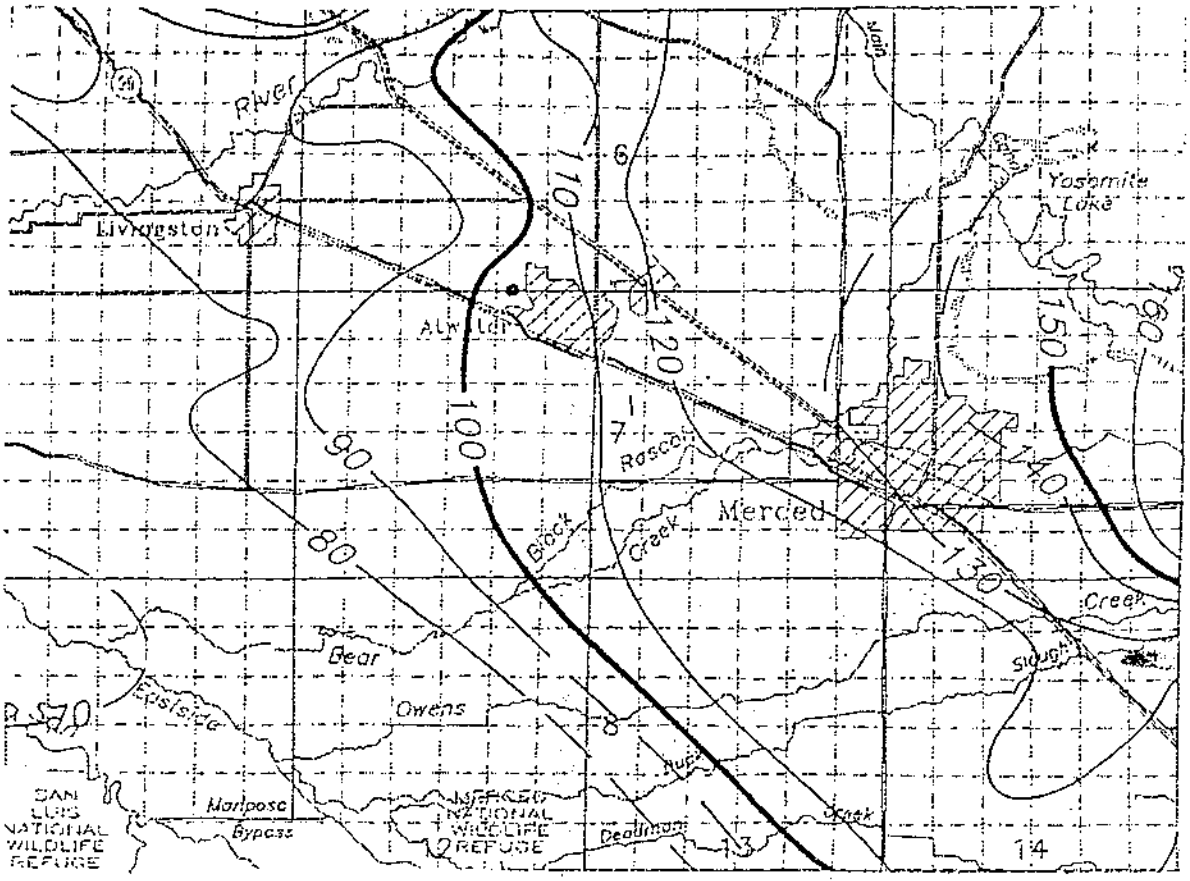


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1990

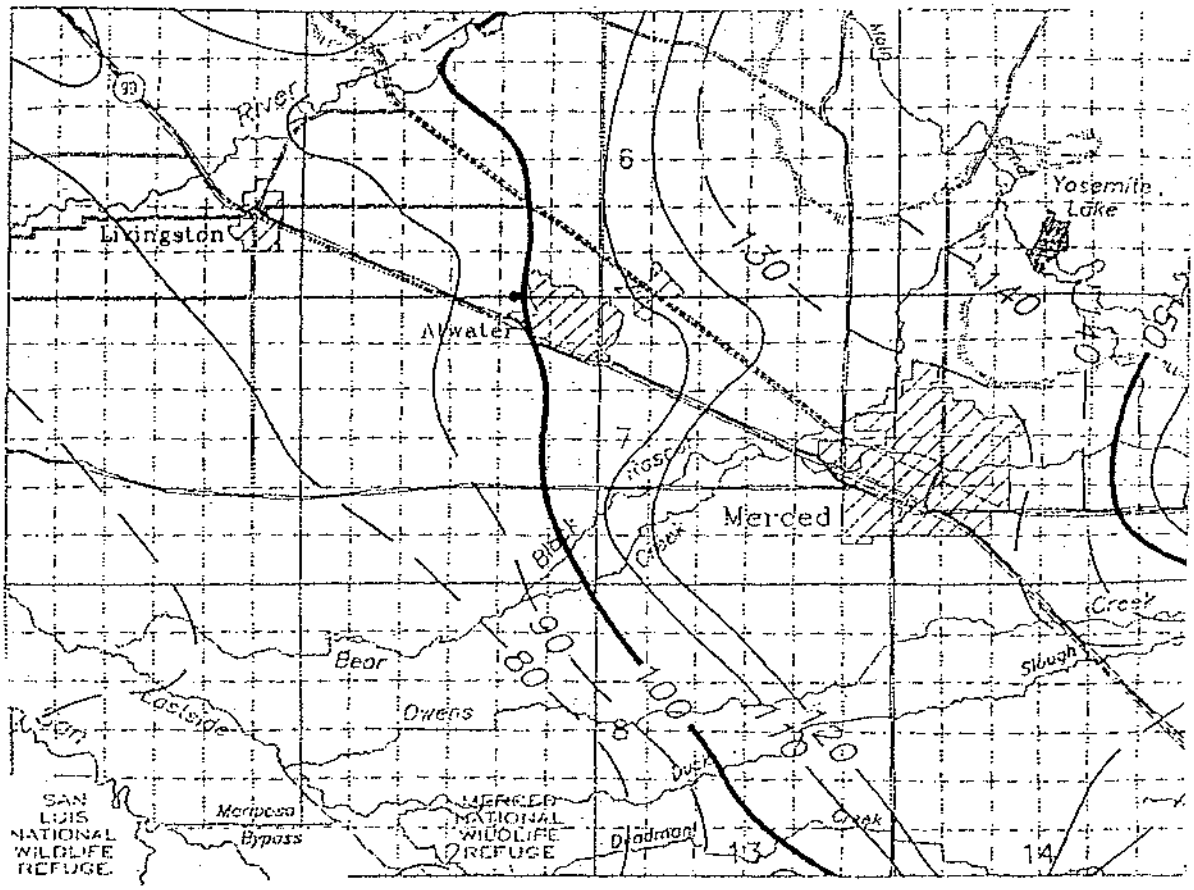


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1991

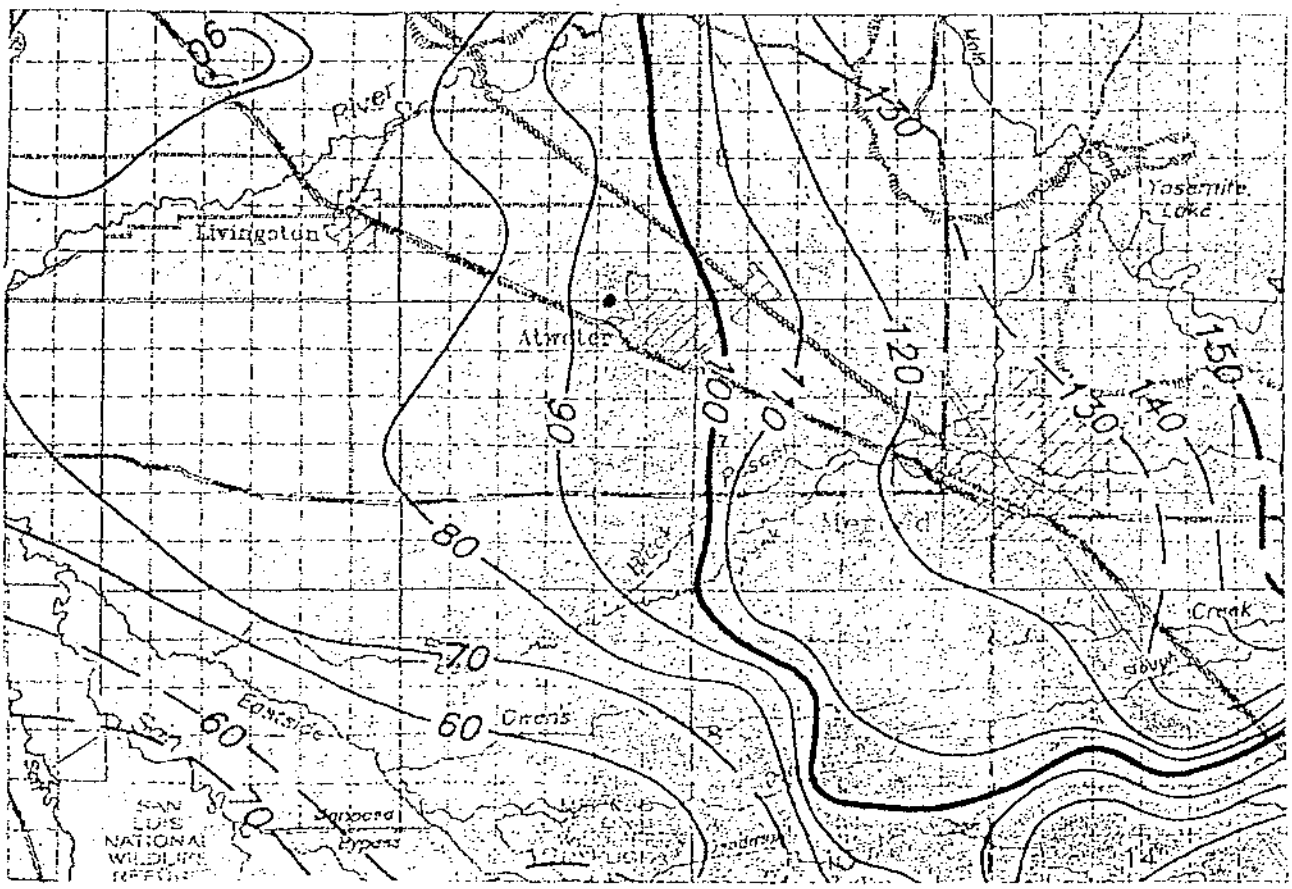


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1992

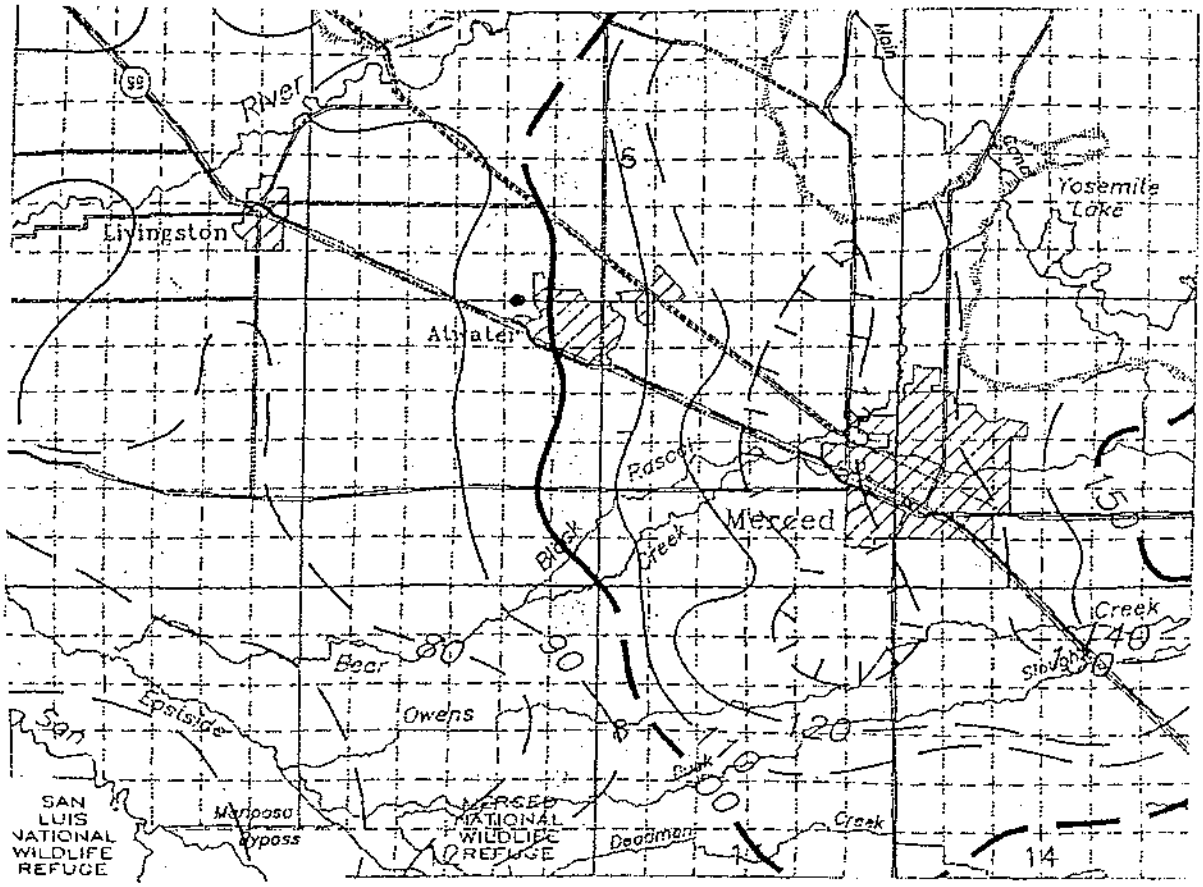


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1993

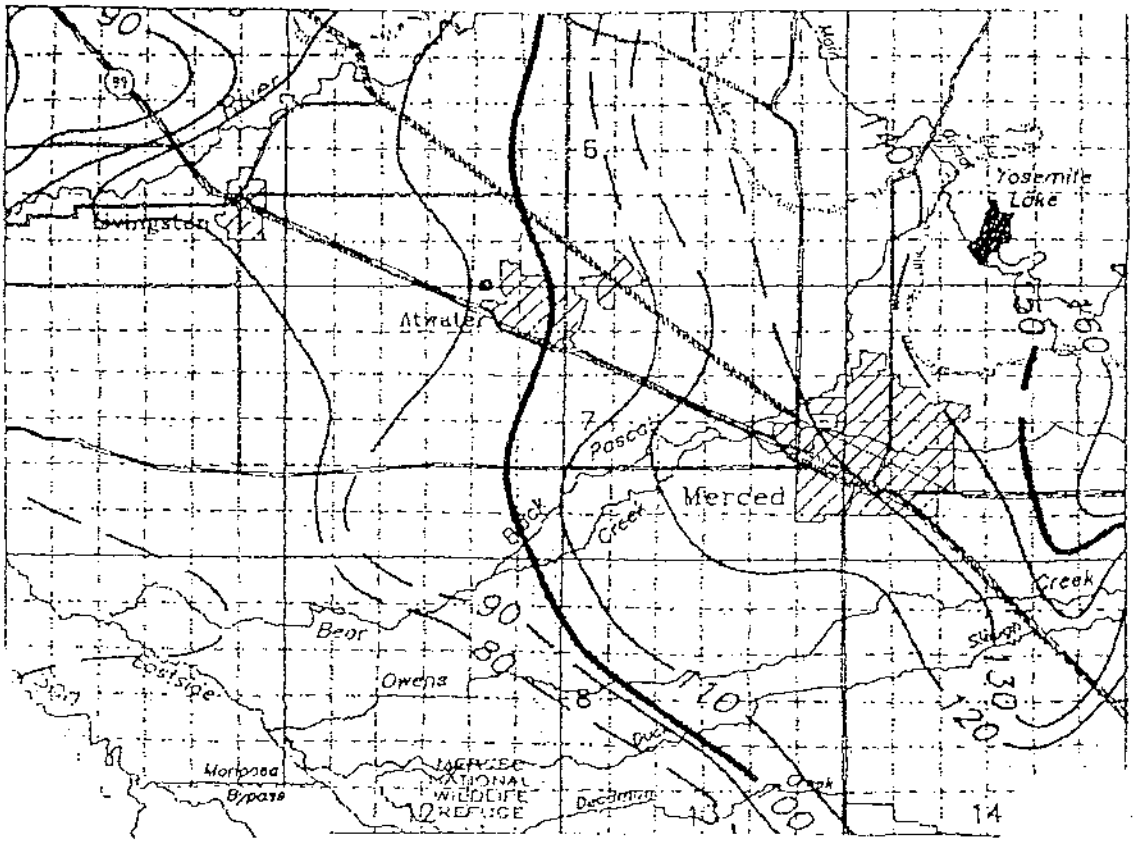


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1994

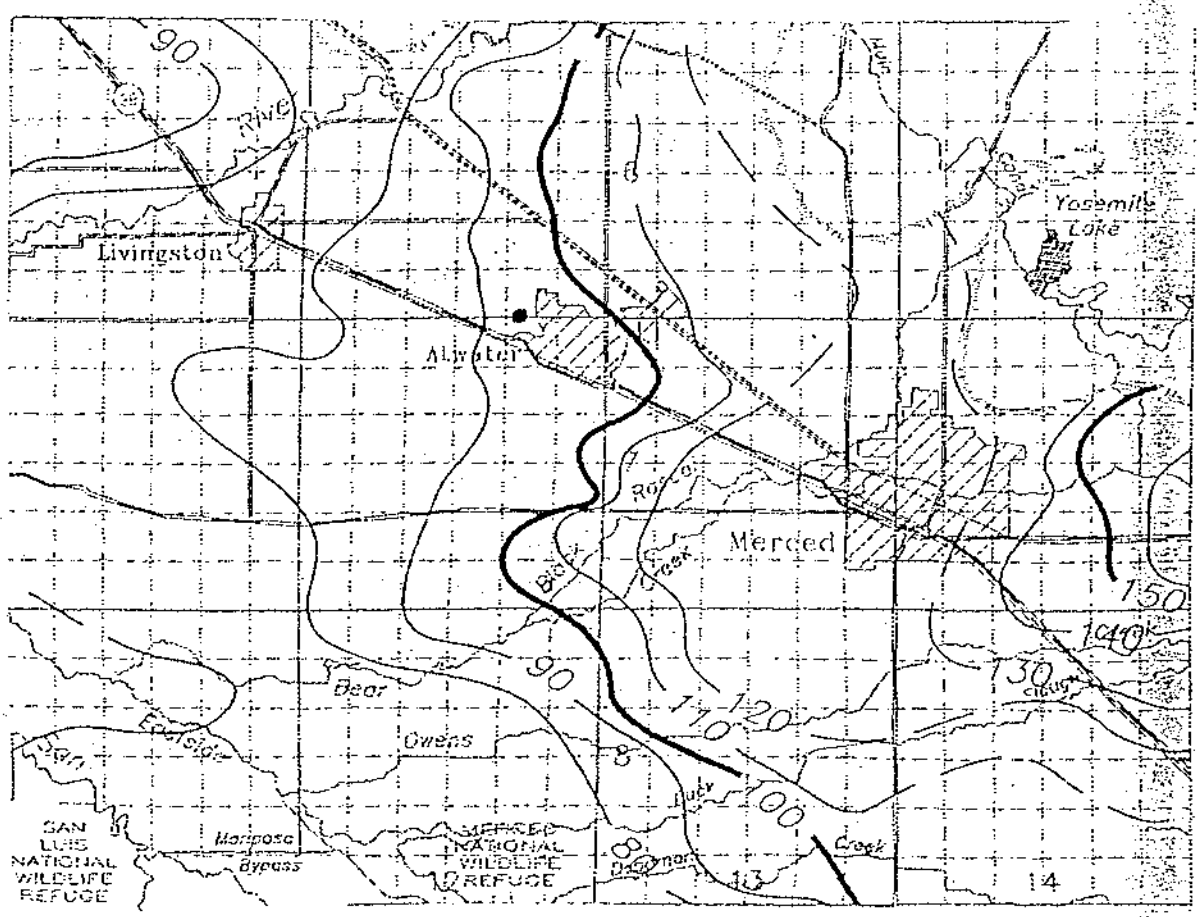


LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1995



LINES OF EQUAL ELEVATION OF WATER IN WELLS

UNCONFINED AQUIFER

San Joaquin Valley

Spring 1996

APPENDIX B

J. R. Wood, Inc., Well Logs

COPY

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 082633

...ment No. ____ State Well No. ____

...it No. ____ Date ____ Other Well No. ____

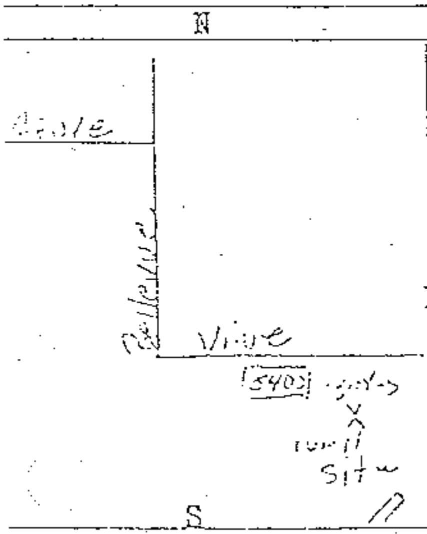
(1) OWNER: Name WOOD FRUIT CO.
916 W. BELLEVUE P.O. BOX 545
ATWATER, CALIF. Zip 95301

(2) LOCATION OF WELL (See instructions): MERCED Owner's Well Number #8 GRAPES

Address if different from above ____

Township ____ Range ____ Section ____

Distance from cities, roads, railroads, fences, etc. 300 FT. EAST OF NORTH VINE, ATWATER



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☒
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) EQUIPMENT:
Rotary ☐ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☐ No ☒ Size ____
Diameter of bore ____
Packed from ____ to ____

(7) CASING INSTALLED:
Steel ☐ Plastic ☐ Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
	148	14	10

(8) PERFORATIONS: NONE
Type of perforation or size of screen ____

From ft.	To ft.	Slot size
—0—	—0—	—0—

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☐ No ☒ If yes, to depth ____ ft.
Were strata sealed against pollution? Yes ☐ No ☒ Interval ____ ft.
Method of sealing ____

(10) WATER LEVELS:
Depth of first water, if known 41 ft.
Standing level after well completion ____ ft.

(11) WELL TESTS:
Was well test made? Yes ☐ No ☒ If yes, by whom? ____
Type of test Pump ☐ Bailer ☐ Air lift ☐
Depth to water at start of test ____ ft. At end of test ____ ft.
Discharge ____ gal/min after ____ hours Water temperature ____
Chemical analysis made? Yes ☐ No ☒ If yes, by whom? ____
Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 210 ft. Depth of completed well 210 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	8	SANDY SOIL
8	14	COARSE BROWN SAND
14	17	SANDY BROWN CLAY
17	28	BROWN SAND
28	41	FINE BROWN SAND & GRAVEL
41	52	COARSE GREY SAND
52	67	SILT W/LAYERS OF GREY CLAY
67	81	COARSE GREY SAND
81	88	SILT & GREY SAND
88	102	COARSE GREY SAND
102	107	GREY CLAY
107	121	SANDY BROWN CLAY
121	132	GREY PACKED SAND
132	143	SILTY BROWN CLAY & BROWN SAND.
143	159	GREY CLAY
159	172	SANDY BROWN CLAY
172	176	SOFT GREY CLAY
176	203	BROWN CLAY
203	210	COARSE BROWN SAND & GRAVEL
210	—	RED CLAY

#8 Grape Well

Received by OMRI
MAR 15 2001

Work started 6-29 1983 Completed 7-3 1983

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Signed STAN HARDIN
(Well Driller)

NAME HARDIN WELL DRILLING
(Person, firm, or corporation) (Typed or printed)

Address 8760 EAST VOORHEES RD.
City LE GRAND, CALIF Zip 95333
License No. # 419571 Date of this report 7-5-83

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Do Not Fill In

№ 145756

State Well No.

Other Well No.

ATE this copy

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

OWNER:

Woods Fruit Company

Address: 7916 West Bellevue Rd.

Atwater, California 95301

LOCATION OF WELL:

Merced — Owner's number, if any

Township, Range, and Section: T 6 S R 12 E S 35

Distance from cities, roads, railroads, etc.: 150' East of Vine

50' South of Bellevue Road

TYPE OF WORK (check):

New Well [X] Deepening [ ] Reconditioning [ ] Destroying [ ]

If destruction, describe material and procedure in Item 11.

PROPOSED USE (check):

Domestic [ ] Industrial [ ] Municipal [ ]

Irrigation [X] Test Well [ ] Other [ ]

(5) EQUIPMENT:

Rotary [ ]

Cable [X]

Other [ ]

CASING INSTALLED:

STEEL: OTHER:

SINGLE [X] DOUBLE [ ]

If gravel packed

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
0	168	14	10			

Type of well ring: X.heavy Band — Size of gravel:

Describe joint: Buttweld

PERFORATIONS OR SCREEN:

Type of perforation or name of screen: None

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.

CONSTRUCTION:

Was a surface sanitary seal provided? Yes [ ] No [X] To what depth ft.

Were any strata sealed against pollution? Yes [ ] No [X] If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing

WATER LEVELS:

Depth at which water was first found, if known ft.

Standing level before perforating, if known 54 ft.

Standing level after perforating and developing ft.

WELL TESTS:

Was pump test made? Yes [X] No [ ] If yes, by whom? Anderson Pump

Yield: 2800 gal/min with 97 ft. drawdown after hrs.

Temperature of water — Was a chemical analysis made? Yes [ ] No [X]

Was electric log made of well? Yes [ ] No [X] If yes, attach copy

(11) WELL LOG:

Total depth 192 ft. Depth of completed well 187 ft.

Formation: Describe by color, character, size of material, and structure

From ft.	To ft.	Formation
0'	7	Atwater sand
7	9	Hard pan
9	18	Brown sand & silt
18	34	White sand
34	48	Red sandy clay
48	61	Grey clay
61	100	Fine brown sand
100	104	Grey clay
104	106	Grey sand
106	112	Brown sandy clay
112	119	Brown sand & silt
119	133	Brown sandy clay
133	139	Fine brown sand
139	148	Medium brown sand
148	160	Grey packed sand
160	164	Coarse grey sand
164	172	Grey clay
172	186	Sandy brown clay
186	192	Coarse grey sand

Received by OMRI MAR 15 2001

Work started 7--28 19 76. Completed 7--31 19 76

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Everett A Loewenstein
(Person, firm, or corporation) (Typed or printed)

Address 1408 Cameron Lane

Merced, California 95340

[SIGNED] [signature]
Well Driller

License No. 254339 Dated August 19, 1976

SKETCH LOCATION OF WELL ON REVERSE SIDE

APPENDIX C

DWR Water Year Index Data

Chronological Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices

Based on unimpaired runoff in [million acre-feet] which is subject to revision. Indices in italics are estimates. 7/3/97

	Sacramento Valley					San Joaquin Valley					Eight River Index				
	River Runoff [maf]			WY Index		River Runoff [maf]			WY Index		River Runoff [maf]				
WY	Oct-Mar	Apr-Jul	WY	Index	Yr type	Oct-Mar	Apr-Jul	WY	Index	Yr type	Jan	Feb	Mar	Apr	May
1951	16.77	5.42	22.95	9.18	AN	4.35	2.83	7.25	3.14	AN	3.40	3.52	2.66	2.81	3.15
1952	13.86	13.68	28.60	12.38	W	2.18	6.84	9.30	5.17	W	3.48	4.03	3.68	6.35	7.51
1953	10.83	8.26	20.09	9.55	W	1.07	3.18	4.35	3.03	BN	5.40	1.52	2.06	3.25	3.38
1954	9.74	6.81	17.43	8.51	AN	1.10	3.16	4.30	2.72	BN	2.20	2.84	3.66	4.56	3.27
1955	5.19	5.07	10.98	6.14	D	0.78	2.67	3.50	2.30	D	1.16	0.96	1.27	1.97	3.22
1956	20.32	8.60	29.89	11.38	W	4.14	5.29	9.67	4.46	W	7.52	3.71	3.07	3.51	5.24
1957	7.72	6.29	14.89	7.83	AN	1.02	3.19	4.29	3.01	BN	0.79	2.65	3.41	2.36	3.85
1958	16.37	12.24	29.71	12.16	W	1.67	6.40	8.36	4.77	W	2.39	7.61	4.71	6.04	6.74
1959	7.40	3.84	12.05	6.75	BN	0.98	1.85	2.98	2.21	D	2.25	2.50	1.98	2.27	1.82
1960	7.72	4.65	13.06	6.20	D	0.85	2.07	2.96	1.85	C	0.90	3.15	3.22	2.50	2.39
1961	6.87	4.39	11.97	5.68	D	0.54	1.50	2.10	1.38	C	0.86	2.14	1.93	2.02	2.16
1962	8.17	6.23	15.11	6.65	BN	1.26	4.24	5.61	3.07	BN	0.78	4.08	2.39	3.89	3.14
1963	12.01	10.09	22.99	9.63	W	1.68	4.37	6.24	3.57	AN	1.70	4.66	2.10	5.60	4.99
1964	5.90	4.37	10.92	6.41	D	0.93	2.14	3.14	2.19	D	1.55	1.01	1.15	1.92	2.44
1965	16.59	8.13	25.64	10.15	W	3.23	4.55	8.15	3.81	W	5.61	2.26	1.97	4.74	3.81
1966	7.42	4.84	12.95	7.16	BN	1.49	2.42	3.98	2.51	BN	1.85	1.56	2.52	3.33	2.52
1967	12.14	11.01	24.06	10.20	W	2.46	7.09	9.98	5.25	W	3.34	2.52	4.09	3.82	6.26
1968	8.66	4.12	13.64	7.24	BN	1.02	1.85	2.94	2.21	D	1.49	3.71	2.55	2.17	2.15
1969	15.33	10.68	26.98	11.05	W	3.84	8.14	12.29	6.09	W	7.91	4.73	3.36	5.44	7.34
1970	18.87	4.35	24.06	10.40	W	2.55	2.96	5.61	3.18	AN	10.68	3.02	3.12	1.82	2.77
1971	12.71	8.90	22.57	10.37	W	1.56	3.23	4.91	2.89	BN	3.05	1.83	3.73	3.40	4.18
1972	7.61	5.02	13.43	7.29	BN	1.25	2.22	3.57	2.16	D	1.40	1.73	3.30	2.52	2.61
1973	12.80	6.38	20.05	8.58	AN	1.87	4.48	6.47	3.50	AN	4.08	3.66	3.27	3.08	4.76
1974	21.69	9.78	32.50	12.99	W	2.43	4.53	7.12	3.90	W	6.93	2.10	6.18	5.07	4.69
1975	9.24	8.95	19.23	9.35	W	1.37	4.65	6.18	3.85	W	1.01	2.92	4.65	2.89	5.40
1976	4.63	2.75	8.22	5.29	C	0.78	1.07	1.97	1.57	C	0.65	0.88	1.34	1.35	1.44
1977	2.49	1.93	5.12	3.11	C	0.22	0.80	1.05	0.84	C	0.47	0.48	0.54	0.69	0.91
1978	14.90	8.12	23.92	8.65	AN	2.57	6.50	9.65	4.58	W	5.91	3.48	5.36	4.40	4.70
1979	6.06	5.64	12.41	6.67	BN	1.87	3.99	5.98	3.67	AN	1.44	2.10	2.90	2.67	4.50
1980	15.49	6.00	22.33	9.04	AN	3.74	5.41	9.47	4.73	W	6.89	5.93	3.62	3.11	3.67
1981	6.81	3.63	11.10	6.21	D	0.85	2.29	3.22	2.44	D	1.57	1.76	2.48	2.32	2.11
1982	20.56	11.73	33.32	12.72	W	3.78	7.00	11.41	5.45	W	3.50	5.57	4.74	8.05	5.68
1983	22.75	13.66	37.65	15.29	W	5.42	8.73	15.01	7.22	W	4.25	6.46	10.57	4.87	6.96
1984	15.98	5.52	22.35	10.00	W	3.51	3.48	7.13	3.69	AN	2.85	2.29	3.08	2.50	3.60
1985	6.24	4.00	11.04	6.47	D	1.11	2.41	3.60	2.40	D	0.84	1.21	1.59	2.79	2.14
1986	19.44	5.37	25.72	9.93	W	4.36	4.92	9.50	4.31	W	2.62	11.55	7.09	3.19	3.56
1987	5.82	2.77	9.20	5.83	D	0.55	1.48	2.08	1.86	C	0.78	1.51	2.54	1.73	1.47
1988	5.77	2.89	9.19	4.63	C	0.86	1.55	2.48	1.48	C	1.83	1.01	1.26	1.48	1.58
1989	9.00	5.10	14.80	6.13	D	1.07	2.42	3.56	1.96	C	0.85	0.99	6.14	3.58	2.21
1990	4.94	3.73	9.23	4.81	C	0.83	1.59	2.46	1.51	C	1.27	0.88	1.83	1.80	1.77
1991	3.92	4.00	8.45	4.22	C	0.56	2.57	3.20	1.96	C	0.37	0.45	2.64	1.95	2.40
1992	5.49	2.91	8.92	4.08	C	0.86	1.66	2.58	1.56	C	0.58	2.41	1.99	2.17	1.33
1993	12.43	8.96	22.17	8.54	AN	2.49	5.65	8.38	4.20	W	4.06	3.12	5.70	4.33	5.23
1994	4.54	2.71	7.77	5.01	C	0.66	1.80	2.54	2.05	C	0.78	1.23	1.48	1.56	1.79
1995	19.41	13.41	33.90	12.69	W	3.67	8.02	12.35	5.96	W	8.02	3.06	9.95	5.58	7.09
1996	13.00	8.34	22.20	10.24	W	2.56	4.50	7.18	4.11	W	2.42	6.22	4.24	3.98	5.43
1997	20.29	14.5		10.91	W	5.75	3.6		4.14	W	12.12	2.76	2.50		
1998															
1999															
2000															