

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 90-003  
NPDES NO. CA0029637

WASTE DISCHARGE REQUIREMENTS FOR:

NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY

999 EAST ARQUES AVENUE SITE  
SUNNYVALE, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board) finds that:

1. New England Mutual Life Insurance Company (NEM), hereinafter called the discharger, by application dated April 4, 1989, has applied for issuance of waste discharge requirements under the National Pollutant Discharge Elimination System (NPDES).
2. NEM owns the site located at 999 East Arques Avenue, Sunnyvale, Santa Clara County, near the intersection of U.S. Highway 101 and the Lawrence Expressway. New England Mutual Life Insurance Company obtained title to the subject site in October 1978 and retains current ownership.
3. Subsurface investigations by NEM have revealed significant levels of organic chemical pollution in soils and ground water beneath and downgradient of the site.
4. Eight VOCs were found in A aquifer ground water samples, the most predominant of which were TCE, trichloroethane (TCA), and cis-1,2-dichloroethene (cis-1,2-DCE). The highest concentrations of VOCs, primarily TCE, up to a concentration of 390,000 parts per billion (ppb), were reported in ground water samples collected from wells located on the eastern portion of the site. Five VOCs were reported in B aquifer ground water samples. The predominant VOCs reported in these samples were TCE and acetone, with the highest concentrations (up to 760,000 ppb TCE and 55,000 ppb acetone) reported in ground water samples collected from a well located on the east side of the main building.
5. The discharger seeks to minimize further migration of VOCs and contain affected ground water by installing a ground water extraction and treatment system onsite. This system will consist of two extraction wells and carbon adsorption treatment to reduce VOCs in the ground water.

The discharger proposes to discharge from this treatment system an average of 36,000 gallons per day (gpd) and a maximum of 72,000 gpd of treated ground water to a storm

drain on Arques Avenue which is tributary to Calabazas Creek, Guadalupe Slough, and South San Francisco Bay.

The discharger has considered the feasibility of reclamation, reuse, or discharge to a publicly owned treatment works (POTW), as specified in Board Resolution No. 88-160. Because the site is currently vacant and scheduled for demolition, onsite reclamation of ground water for facility production or landscape irrigation are considered infeasible at this time. Also, the City of Sunnyvale does not allow any discharges of treated ground water into their sewer system on a permanent basis.

6. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for Calabazas Creek and South San Francisco Bay.
7. The existing and potential beneficial uses of Calabazas Creek include:
  - Agricultural supply
  - Ground water recharge
  - Navigation
  - Contact and non-contact water recreation
  - Warm fresh water and cold fresh water habitat
  - Wildlife habitat
8. The existing and potential beneficial uses of South San Francisco Bay include:
  - Contact and non-contact water recreation
  - Wildlife habitat
  - Preservation of rare and endangered species
  - Estuarine habitat
  - Fish spawning and migration
  - Industrial service supply
  - Shellfishing
  - Navigation
  - Ocean commercial and sport fishing
9. The Basin Plan prohibits discharge of wastewater which has "particular characteristics of concern to beneficial uses" (a) "at any point in San Francisco Bay south of the Dumbarton Bridge" and (b) "at any point where the wastewater does not receive a minimum initial dilution of at least 10:1 or into any nontidal water, dead-end slough, similar confined water, or any immediate tributary thereof".
10. The Basin Plan allows for exceptions to the prohibitions referred to in Finding #9 above when it can be demonstrated that a net environmental benefit can be derived as a result of the discharge.
11. Exceptions to the prohibitions referred to in Finding #9 are warranted because this discharge is an integral part of a program to cleanup polluted ground water and thereby produce an environmental benefit, and because receiving water concentrations

are expected to be below levels that would affect beneficial uses. Should studies indicate chronic effects, not currently anticipated, the Board will review the requirements of this Order based upon Section B.1.e.

12. The Basin Plan prohibits discharge of "all conservative toxic and deleterious substances, above those levels which can be achieved by a program acceptable to the Board, to waters of the Basin". The discharger's ground water extraction and treatment systems and associated operation, maintenance, and monitoring plans constitute an acceptable control program for minimizing the discharge of toxicants to waters of the State.
13. Effluent limitations of this Order are based on the Clean Water Act, Basin Plan, State and U. S. Environmental Protection Agency (EPA) plans and policies, and best engineering and geologic judgement. EPA Region IX draft guidance "NPDES Permit Limitations for Discharge of Contaminated Groundwater: Guidance Document" was also considered in the determination of effluent limits.
14. The issuance of waste discharge requirements for this discharge is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Water Code.
15. The Board has notified the discharger and interested agencies and persons of its intent to issue waste discharge requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
16. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. EFFLUENT LIMITATIONS

1. The effluent, at the discharge point to the storm drain, shall not contain constituents in excess of the limits contained in Table 1:

**Table 1**

<u>Constituent</u>	<u>Instantaneous Maximum (<math>\mu\text{g/l}</math>)</u>
<u>VOCs</u>	
trichloroethene	5.0
1,1,1-trichloroethane	5.0
1,1-dichloroethane	5.0
1,1-dichloroethene	5.0
(cis + trans)-1,2-dichloroethene	5.0
1,2-dichloroethane	0.5
perchloroethene	5.0
vinyl chloride	0.5
Freon 113	5.0
chloroform	5.0
acetone	50.0
total VOCs	100.0
<u>Aromatics</u>	
toluene	5.0
<u>Metals</u>	
arsenic	20.0
cadmium	10.0
chromium (VI)	11.0
copper	20.0
cyanide	25.0
lead	5.6
mercury	1.0
nickel	7.1
silver	2.3
zinc	58.0

2. The pH of the discharges shall not exceed 8.5 nor be less than 6.5.
3. In any representative set of samples, the discharges shall meet the following limit of quality:

Toxicity: The survival of rainbow trout in 96-hour bioassays of the effluent as discharged shall be a median of 90% survival and a 90 percentile value of not less than 70% survival.

B. RECEIVING WATER LIMITATIONS

1. The discharges of wastes shall not cause the following conditions to exist in waters of the State at any place:

- a. floating, suspended, or deposited macroscopic particulate matter or foam;
  - b. bottom deposits or aquatic growths;
  - c. alteration of temperature or apparent color beyond present natural background levels;
  - d. visible, floating, suspended, or deposited oil or other products of petroleum origin;
  - e. toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.
2. The discharges of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:
- a. pH: The pH shall not be depressed below 6.5 nor raised above 8.5, nor caused to vary from normal ambient pH levels by more than 0.5 units.
  - b. Dissolved oxygen: 5.0 mg/l minimum. The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause lesser concentration(s) than specified above, the discharge shall not cause further reduction in the concentration of dissolved oxygen.
  - c. Un-ionized ammonia (as N):           0.025 mg/l annual mean  
  0.4 mg/l maximum
3. This discharges shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. PROVISIONS

- 1. The discharger shall comply with all sections of this order immediately upon adoption by the Board and upon starting any discharge.

2. The discharger shall comply with the self-monitoring program as adopted by the Board and as may be amended by the Executive Officer.
3. The discharger shall notify the Regional Board if any activity has occurred or will occur which would result in the discharge, on a frequent or routine basis, of any toxic pollutant which is not limited by this Order.
4. Any discharge to a location other than the discharge point(s) specified in this Order will require a modification to this Order or submission of a second NPDES application.
5. The discharger shall comply with all items of the attached "Standard Provisions, Reporting Requirements and Definitions" dated December 1986 and modified January 1987, except items A.10, B.2, B.3, C.8 and C.11.
6. This Order expires January 17, 1995. The discharger must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code no later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements.
7. This Order shall serve as a National Pollutant Discharge Elimination System Permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective 10 days after date of its adoption provided the Regional Administrator, Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on January 17, 1990.

  
STEVEN R. RITCHIE  
Executive Officer

Attachments:  
Self-Monitoring Program  
Site Map

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR:

NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY  
999 East Arques Avenue Site  
Sunnyvale, Santa Clara County

NPDES NO. CA0029637

ORDER NO. 90-003

CONSISTS OF:

PART A Dated December 1986 and modified January 1987

PART B Adopted January 17, 1990

PART B

NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY  
999 East Arques Avneue Site  
Sunnyvale, Santa Clara County

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

<u>Station</u>	<u>Description</u>
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I-001	At a point in the ground water extraction system immediately prior to treatment in the carbon adsorption unit.
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B. EFFLUENT

<u>Station</u>	<u>Description</u>
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E-001	At a point immediately following treatment in the carbon adsorption unit.
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C. RECEIVING WATERS

<u>Station</u>	<u>Description</u>
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R-001	At a point in Calabazas Creek at least 100 feet but no more than 200 feet downstream from the storm drain discharge point of E-001 into Calabazas Creek.
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II. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis is provided in the attached Table A.

III. MODIFICATIONS TO PART A, DATED DECEMBER 1986 AND MODIFIED JANUARY 1987

All items of Self-Monitoring Program Part A, dated December 1986 and as modified January 1987 shall be complied with except for the following:

- A. Additions to Part A: Section G.4.d.5: "Results from each required analysis and observation shall be submitted as laboratory originated data summary sheets in the quarterly self-monitoring reports. All chromatographic peaks for purgeable halocarbons and/or volatile organics shall be identified and quantified for all effluent samples. If previously unquantified peaks are identified in any effluent sample, then these peaks shall be confirmed based on analyses using chemical standards necessary to achieve proper identification and quantification. Results shall also be submitted for any additional analyses performed by the dischargers at the specific request of the Board for parameters for which effluent limits have been established and provided to the dischargers by the Board."
- B. Deletions from Part A: Sections D.2.b., D.2.g., D.3.b., E.1.e.1, E.1.f., E.2.b., E.3., E.4., E.5., F.2.b., G.2., G.4.b., and G.4.f.
- C. Modifications to Part A: For the following, the discharger shall comply with the Sections as changed and reported herein:
1. Section D.2.a. is changed to read:  
  
"Samples of effluent and receiving waters shall be collected at times coincident with influent sampling unless otherwise stipulated. The Regional Board or Executive Officer may approve an alternative sampling plan if it is demonstrated that expected operating conditions warrant a deviation from the standard sampling plan."
  2. Section D.2.d. is changed to read:  
  
"If two consecutive samples of any one constituent or parameter monitored on a weekly or monthly basis in a 30-day period exceed the effluent limit or are otherwise out of compliance, or if the required sampling frequency is once per month or less (quarterly, annually or other) and the sample or parameter exceeds the limit or is otherwise out of compliance, the discharger shall implement procedure(s) acceptable to or approved by the Board's Executive Officer, on a case by case basis."

3. Section D.2.e. is changed to read:

"If any instantaneous maximum limit is exceeded, within 24 hours of receiving the analytical results indicating the violation, a confirmation sample shall be taken and analyzed with 24 hour turn-around time. If the instantaneous maximum is violated in the second sample, the discharge shall terminate immediately, and shall not resume until the cause of the violation is found and corrected and/or the Board's Executive Officer authorizes resumption of the discharge."

4. In Section F.1, the phrase "(at the waste treatment plant)" is changed to read, "(at the locations of the various extraction and treatment systems)".
5. Monthly written reports required in Section G.4 shall be filed monthly by the thirtieth day of the following month.
6. Section G.4.e is changed to read:

"Summary tabulations of the data shall include, for each constituent, total number of analyses, maximum, minimum, and average values for each period. Total flow data shall also be included. This information shall be prepared in a format similar to EPA Form 3320-1. This information shall be submitted only to the Regional Board:

Executive Officer  
California Regional Water Quality Control Board  
1800 Harrison Street, Suite 700  
Oakland, CA 94612"

7. The Annual Report required in Section G.5. shall be submitted by January 30 of each year in place of the monthly report due on the same day.

#### IV. MISCELLANEOUS REPORTING

If any chemicals or additives are proposed to be used in the operation and/or maintenance of the ground water extraction/treatment system, the discharger shall obtain the Executive Officer's concurrence prior to use. The details concerning such approved use shall be reported in the next periodic report submitted to the Board.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 90-003.
2. Was adopted by the Board on January 17, 1990.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the dischargers, and revisions will be ordered by the Executive Officer or Regional Board.



STEVEN R. RITCHIE  
Executive Officer

Attachments: Table A  
Site Map

**TABLE A  
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS**

Sampling Station	I-1	E-1	R-1											
TYPE OF SAMPLE	G	G	G											
Flow Rate (mgd)		W												
BCD, 5-day, 20°C, or COD (mg/l & kg/day)		Y												
Chlorine Residual & Dosage (mg/l & kg/day)														
Settleable Matter (ml/l-hr. & cu. ft./day)		Q	Q											
Total Suspended Matter (mg/l & kg/day)														
Oil and Grease (mg/l & kg/day)														
Coliform (Total or Fecal) (MPN/100 ml) per req't														
Fish Tox'y 96-hr. TL & Surv'l in undiluted waste		Y												
Ammonia Nitrogen (mg/l & kg/day)		V												
Nitrate Nitrogen (mg/l & kg/day)														
Nitrite Nitrogen (mg/l & kg/day)														
Total Organic Nitrogen (mg/l & kg/day)														
Total Phosphate (mg/l & kg/day)														
Turbidity (Jackson Turbidity Units)														
pH (units)		Q	Q											
Dissolved Oxygen (mg/l and % Saturation)		Q	Q											
Temperature (°C)		Q	Q											
Apparent Color (color units)														
Secchi Disc (inches)														
Sulfides (if DO<5.0 mg/l) Total & Dissolved (mg/l)														
Arsenic (mg/l & kg/day)		M/Q												
Cadmium (mg/l & kg/day)		M/Q												
Chromium, Total (mg/l & kg/day)		M/Q												
Copper (mg/l & kg/day)		M/Q												
Cyanide (mg/l & kg/day)		M/Q												
Silver (mg/l & kg/day)		M/Q												
Lead (mg/l & kg/day)		M/Q												

Adopted: January 17, 1990

**TABLE A (continued)**

**SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS**

Sampling Station	I-1		E-1		R-1									
TYPE OF SAMPLE	G		G		G									
Mercury (mg/l & kg/day)			M/Q											
Nickel (mg/l & kg/day)			M/Q											
Zinc (mg/l & kg/day)			M/Q											
Phenolic Compounds (mg/l & kg/day)														
All Applicable Standard Observations														
Bottom Sediment Analyses and Observations														
Total Ident. Chlor. Hydro- carbons (mg/l & kg/day)														
EPA Method 601 with Freon 113	M/Q		W/M		Q									
EPA Method 602	M/Q		W/M		Q									
EPA Method 624*	Y		Y		Y									
Acetone	M/Q		W/M		Q									

**LEGEND FOR TABLE**

**TYPES OF SAMPLES**

- G = grab sample
- C-24 = composite sample - 24-hour
- C-X = composite sample - X hours  
(used when discharge does not  
continue for 24-hour period)
- Cont = continuous sampling
- DI = depth-intergrated sample
- BS = bottom sediment sample
- O = observation

**TYPES OF STATIONS**

- I = treatment facility influent stations
- E = waste effluent stations
- C = receiving water stations
- P = treatment facilities perimeter stations
- L = basin and/or pond levee stations
- B = bottom sediment stations
- G = groundwaters stations

**FREQUENCY OF SAMPLING**

- |   |  |   |
|---|--|---|
| E = each occurrence   | 2/H = twice per hour   | 2H = every 2 hours  |
| H = once each hour  | 2/W = 2 days per week  | 2D = every 2 days   |
| D = once each day   | 5/W = 5 days per week  | 2W = every 2 weeks  |
| W = once each week  | 2/M = 2 days per month   | 3M = every 3 months   |
| M = once each month   | 2/y = once in March and<br>once in September   | Cont = continuous   |
| Y = once each year  | Q = quarterly, once in<br>March, June, Sept.<br>and December   | M/Q = monthly for first<br>six months after<br>startup of opera-<br>tions and reduced<br>to quarterly there-<br>after |
| V = varies; total ammonia<br>nitrogen shall be ana-<br>lyzed and unionized am-<br>monia calculated whenever<br>fish bioassay test re-<br>sults fail to meet the<br>specified percent survival | W/M = weekly for first three<br>months after startup of<br>operations and reduced<br>to monthly thereafter |   |

\* When water samples are tested by EPA Method 624, it is not necessary to test the samples by EPA Methods 601 and 602

**DISCHARGE ROUTE FOR TREATED GROUNDWATER**

