COMMONWEALTH OF MASSACHUSETTS

OFFICE OF CONSUMER AFFAIRS AND BUSINESS REGULATION

DEPARTMENT OF
TELECOMMUNICATIONS & ENERGY

PIPELINE ENGINEERING AND SAFETY DIVISION

INCIDENT REPORT

82 Marsh View Road, Chatham, Massachusetts
October 30, 2002

INCIDENT REPORT:

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I. INTRODUCTION

A. Scope of this Investigation

The Pipeline Engineering and Safety Division of the Massachusetts Department of Telecommunications and Energy ("Department"), pursuant to G. L. c. 164, § 105A and G. L. c. 82, § 40 ("Dig Safe") has investigated a natural gas ("gas") explosion ("incident") at 82 Marsh View Road, Chatham, that occurred on October 30, 2002. The incident resulted in a flash fire, damaging the house at that address. One person, a maintenance man working for the homeowner, was hospitalized with smoke inhalation. KeySpan Energy Delivery Company ("KeySpan" or "Operator"), the operator of the pipeline reported the incident to the U.S. Department of Transportation/Office of Pipeline Safety (Exh. 1).

The Department's investigation included a review of compliance with the Dig Safe law. The procedures to determine the nature and extent of Dig Safe violations are contained in 220 C.M.R. §§ 99.00 et seq. In addition, these regulations set forth the standards used to determine the amount of civil penalties to be imposed. On December 30, 2002, the Department issued a Notice of Probable Violation ("NOPV") to Solid Earth Technologies ("SET" or "Contractor") (Exh. 2). In the NOPV, the Department alleged that a violation of the Dig Safe law occurred on October 30, 2002 on Marsh View Road, Chatham. SET signed a Consent Order (Exh. 3) on January 7, 2003.

As part of the Department's annual certification process by the United States Department of Transportation ("DOT"), the Department must report to the DOT

> "[e]ach accident or incident . . . involving a fatality, personal injury requiring

> hospitalization, of property damage of loss of more than an amount the Secretary establishes, any other accident the [Department] considers significant, and a summary of the investigation by the authority of the cause and circumstances surrounding the accident or incident."
> See 49 U.S.C. § 60105(c)(1)(B).

The purpose of the report is to inform the DOT as to the circumstances surrounding and the cause of the incident.

The Department has established procedures for determining the nature and extent of the violations of codes and regulations pertaining to the safety of pipeline facilities and the transportation of gas, including, but not limited to, 220 C.M.R. §§ 101.00 through 113.00. See 220 C.M.R. §§ 69.00 et seq. The Department also enforces the DOT safety standards for gas pipeline systems and the drug and alcohol testing regulation as set forth in 49 C. F. R. §§192.00 et seq. and §§ 199.00 et seq. and 220 C.M.R. § 69.12.

B. Overview of the Incident

At approximately 8:30 p.m. on October 30, 2002, KeySpan attempted to notify the Department of a fire at 82 Marsh View Drive, Chatham. On October 31, 2002, KeySpan reported that a Contractor, SET, had punctured the one-inch diameter plastic service line[1] while constructing a walkway to the house. The resulting failure allowed gas to leak into the house causing a fire where one person was hospitalized. The Department sent an investigator to the scene.

On October 28, 29 and 30, 2002, SET was constructing the plank walkway or

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1 A service line is a distribution line that transports gas from a common source of supply to a customer meter . . . 49 C.F.R. §192.3: Definitions.

footbridge over marshy terrain to the house at 28 Marsh View Road. The walkway was anchored by metal stakes or piers. While drilling a pier into the marshy ground, SET contacted the high pressure[2] plastic service line, owned and operated by KeySpan. The service line was encased in a plastic conduit. The pier penetrated the conduit and the plastic service line. The small service line puncture allowed gas to enter the basement. The ignition source may have been a light switch operated by a maintenance man as he was leaving the half-basement (Exh. 4). Some of the insulation and the electrical wiring in the house was damaged by the resulting fire.

The Department's investigation finds that the contractor, SET, failed to notify Dig Safe prior to excavating in the vicinity of KeySpan's underground facilities. The Dig Safe law requires that notification be tendered at least 72 hours before excavating.

II. THE DEPARTMENT'S INVESTIGATION

A. Description of the Site

Marsh View Road is located in a residential area of Chatham adjacent to a salt water marsh. The houses are single family and are supplied with gas by means of a two-inch diameter plastic gas main (Exh 5). On the day of the incident, the main was operating at approximately 52 pounds per square inch gauge ("psig") (Exh. 6).

The house at 82 Marsh View is located on an island in the marsh (Exh. 7). A wooden walkway connects the island to Marsh View Road. The house is a one-story wood-frame

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2 A high pressure system is a system in which the pressure in the main is higher than the pressure provided to the customer. 49 C.F.R. §192.3: Definitions.

construction, with a half-basement (Exh. 8).[3]

KeySpan tied the 608-foot plastic service line to the two-inch diameter plastic main in March 2002 (Exh. 9). The section of the service line that traversed the marsh was encased in a black plastic conduit. The conduit had been placed in the marsh by means of directional drilling. Similar conduits were installed nearby to carry telephone and electric cables (Exhs. 10a, b). The gas service line exited the conduit about 20 feet from the house (Exh. 11) and entered the half-basement through the northwest foundation wall. The customer meter and regulator were located outside of the building (Exh. 12).

B. Description of the Scene

On October 31, 2002 at about 12:30 p.m., an investigator from the Department's Pipeline Engineering and Safety Division ("Division") arrived at 82 Marsh View Road. He met with representatives from KeySpan and the Contractor.

The Division investigator observed that there was some fire and smoke damage in the half-basement. There was fire damage to the wood structure, electrical wiring and insulation in the half-basement (Exhs. 13a, b). The upper level of the house displayed no visible damage (Exh. 14).

The Department inspector observed that the curb valve[4] was closed and the service line had been cut and capped near the house (Exh. 15). On October 31, 2002, KeySpan excavated

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3 A half basement is a basement with a height of approximately 4 feet.

4 A curb valve is a manually operated valve on a service line located at of near the property line. Department regulations require that all high pressure service lines have a curb shutoff. 220 C.M.R. 101.06(14).

and disconnected the service line downstream of the curb valve, capping the live end. Then the service line was pulled out of the conduit (Exh. 16). The service line pipe had a puncture in it. There were some scuff marks on the pipe near the puncture (Exh. 17). Both the marks and the hole were located about 83 feet from the street end of the conduit.

C. KeySpan Gas Company

KeySpan was notified by the Chatham Fire Department (CFD) at 4:52 p.m. on October 30, 2002, of a fire and gas odor at 82 Marsh View Road. The service person that arrived found a gas reading of 30 percent gas in air at the foundation wall. In the lawn and garden in front of the house, the crew found 97 percent gas in air (Exh. 18). The gas concentration in the half-basement was 25 percent of the lower flammable limit (LFL).[5] The crew shut the gas off at the curb valve after locating the probable area of the leak (Exh. 19). The service was also cut and capped near the house. After making the area safe, the crew left for the day.

D. The Contractor

The homeowner hired SET to reconstruct the walkway connecting the island to mainland. The walkway paralleled and was close to the gas service line (Exh. 9). The piers were drilled into the marsh (Exh. 20). Most of the piers were installed about six months prior to the incident (Exh. 4).

On Monday October 28, 2002, SET began installing additional new piers. SET told the

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5 The LFL of natural gas is five percent gas in air; the upper flammable limit is 15 percent gas in air.

Department investigator that the pier at the location of the service line damage was drilled on Monday, October 28, 2002 (Exh. 21). SET continued working at the site the following two days. SET admitted that it had failed to tender notification to Dig Safe prior to installing the piers (Exh. 4).[6] Instead, SET called the homeowner's maintenance man on Wednesday afternoon. The maintenance man said that the Contractor asked him where the gas line was located. SET told the maintenance man that they had to do some additional work on the piers (Exh. 4).

E. <u>The Maintenance Man</u>

After visiting the house on October 30, the homeowner called the maintenance man and asked him "... to check an unknown odor at the house." (Exh. 4). The maintenance man arrived at the house at about 3:15 p.m. The maintenance man smelled no gas outside or in the first floor of the house. After opening a hatch from the bedroom to the half-basement, he turned on the light switch and went down stairs. He stated that he smelled something, but he did not think it was natural gas. While going upstairs, he turned off the light switch (Exh. 22), and he saw a flash and some burning paper. He went upstairs and called the Chatham Fire Department. Upon seeing flames and smoke coming from the half-basement hatch, he

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6 The Dig Safe Law, G. L. C. 82, § 40, requires an excavator to use care when excavating near underground utilities. G. L. c. 82, § 40C states, in the relevant part:

> When excavating in close proximity to the underground facilities of any company when such facilities are to be exposed, non-mechanical means shall be employed, as necessary to avoid damage in locating such facility and any further excavating shall be performed employing reasonable precaution to avoid damage to the underground facilities, including but not limited to, . . . penetrating or destruction of any pipe . . . protective coating thereof, or damage to any pipe. . . .

unsuccessfully employed a small fire extinguisher and a garden hose. The dark smoke then forced him from the house. Shortly after, the Chatham Fire Department extinguished the fire. The maintenance man was admitted to Cape Cod Hospital overnight for treatment of smoke inhalation.

F. Examination of the Pipe

The service pipe was examined on the day after the incident by the Department investigator, representatives of KeySpan, and representatives of the Contractor. The service pipe had been cut and capped near the house on the previous day by KeySpan to make the area safe. The street end of the service pipe and the conduit had not been exposed (Exh. 21).

Once the street end of the service pipe and the conduit were exposed, the service pipe was extracted. There were scuff marks on the service pipe surface and there was also a hole in the service pipe (Exh. 17). The scuff marks and the hole were located 83 feet from service line cut made on the island (Exh. 21). On October 30, 2003, KeySpan excavated a small hole near the pier in question and a pool of water formed. KeySpan observed bubbles in the water. These were located in the marsh and were 83 feet from where the service line had been cut. (Exhs. 23a, b).

III. FINDINGS AND CONCLUSIONS

A. Findings

(1) KeySpan Energy Delivery installed a two-inch diameter plastic main under Marsh View Road, Chatham in 2000.
(2) KeySpan Energy Delivery installed the plastic service line to #82 Marsh View Road, Chatham, on May 12, 2002.
(3) A one-inch diameter plastic service line connected the house at #82 Marsh View Road to the two-inch diameter plastic main on Marsh View Road.

(4) The service line was inserted in a plastic conduit in the marsh area.
(5) Dig Safe was not notified by the Contractor of the work that began on October 28, 2002.
(6) The Contractor was drilling piers for a new walkway.
(9) The Homeowner first noticed an odor of gas in the house two days after the pier was installed.
(10) The Maintenance man was in the house when the flash fire occurred.
(11) The Maintenance man attempted, unsuccessfully, to put out the fire.
(12) The Maintenance man suffered smoke inhalation, requiring hospitalization.
(13) The flash fire damaged the wood structure, electrical wiring and insulation in the half-basement of the house.
(14) The odorant level in the gas meet regulatory requirements.

B. Conclusions

(1) The contractor, Solid Earth Technology is found to be in violation of the notification provisions of G. L. c. 82, § 40.
(2) A pier, drilled by the Contractor on October 28, 2002, punctured the service line and the conduit in which it was located..
(3) The puncture allowed gas to escape into the conduit.
(4) Some of the gas flowed through the conduit to the island and into the ground.
(5) The gas flowed into the half-basement of the house through penetrations in the foundation wall.
(5) The gas was ignited by the maintenance man turning off the light switch.
(6) The flash fire was attributable to hazardous gas concentrations in the house.

IV. LIST OF EXHIBITS

Exhibit 1: U. S. Department of Transportation Incident Reporting Form. (3 pages)

Exhibit 2: NOPV sent to Solid Earth Technologies. (3 pages)

Exhibit 3: Consent Order signed by Solid Earth Technologies. (2 pages)

Exhibit 4: Investigative Report by the Chatham Fire Department. (3 pages)

Exhibit 5: Map of Marsh View Road, Chatham, showing the location of the two-inch diameter main and the conduit through the marsh.

Exhibit 6: Telemetry reports of pressure readings at locations near Marsh View Road at the time of the incident.

Exhibit 7: View of the marsh, the island and the walkway to the island.

Exhibit 8: View of the half-basement.

Exhibit 9: Installation records of the service line to #82 Marsh View Road.

Exhibit 10a: View of electric conduit in the half-basement.

Exhibit 10b: View of the telephone conduit in the half-basement.

Exhibit 11: KeySpan Underground Damage Report. (2 pages)

Exhibit 12: View of gas meter and regulator located outside of the house.

Exhibit 13a: View of some of the fire damage to the electrical wiring.

Exhibit 13b: View of fire damage to wood structure, insulation and electrical wiring.

Exhibit 14: Close up view of the house. Orange cones show the location near the end of the conduit where the service was cut and capped.

Exhibit 15: View of the service where it was cut and capped on the island.

Exhibit 16: Service line being pulled out of the conduit

Exhibit 17: View of the service pipe showing the puncture and the scratches.

Exhibit 18: KeySpan Leak Investigation Report. (3 pages)

Exhibit 19: KeySpan Leak Repair Work Orders. (4 pages)

Exhibit 20: SET Brochure describing the piers and the installation process. (3 pages)

Exhibit 21: Memo from Paul Grieco, DTE, to Robert Smallcomb, DTE, November 1, 2002. (2 pages)

Exhibit 22: View of the light switch.

Exhibit 23a: View of pier at the location where the pipe was damaged.

Exhibit 23b: Close-up view of pier at the location where the pipe was damaged. Note the gas bubbles in the water.

Fax

To:	Information Resources Manager Office of Pipeline Safety Research and Special Projects Administration U.S. Department of Transportation 400 Seventh Street, S.W. Washington, DC 20590	**From:**	Stanley T. Kastanas Manager of Regulatory Compliance KeySpan Energy Delivery 201 Rivermoor Str. W. Roxbury, MA 02132
Fax:	(202) 366-4566	**Fax:**	(978) 459-0773
Phone:	(800) 424-8802	**Phone:**	(978) 815-8909
Date:	11/26/02	**Pages:**	3, including cover page
Re:	Telephonic Incident Report #627826	**CC:**	File

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

• **Comments:** Attached is Form RSPA F 7100.1 (3-84) regarding telephonic incident # 627826 reported on 10/31/02 by the above named fax sender. The sender is providing this follow-up written report (via this facsimile), on behalf of KeySpan, based on inpatient hospitalization reporting. However, the sender does not believe this event rises to the RSPA incident reporting criteria. To the best of KeySpan's knowledge, the contractor's person receiving inpatient hospitalization was for observation due to smoke inhalation. This happened when the contractor's person returned, presumably after an initial gas ignition in the home's crawl space, to fight a fire sustained by the secondary ignition of electrical wires or other materials. At your convenience, please advise KeySpan on such reporting criteria for future reference, or if you need any further information, by contacting the above named sender.

Thank you for your attention to this matter.

Stanley T. Kastanas

Exhibit 1: U. S. Department of Transportation Incident Reporting Form (1 of 3)

NOTICE: This report is required by 49 CFR Part 191. Failure to report can result in a civil penalty not to exceed $1,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $200,000 as provided in 49 USC 1678. Form Approved OMB No. 2137-0522

U.S. Department of Transportation
Research and Special Programs Administration

INCIDENT REPORT - GAS DISTRIBUTION SYSTEM

Report Date 11/26/02
No. _____ (RSPA)

SEE INSTRUCTIONS

PART 1 - GENERAL REPORT INFORMATION

1. a. Operator's 5 digit identification Number: 1 1 1 1 1
   b. Name of Operator: KeySpan Energy Delivery
   c. Number and Street: 201 Rivermoor Street
   d. City, County, State and Zip Code: West Roxbury, MA 02132
2. Location of Incident
   a. Number and Street: 82 Marshview Road
   b. City and County: Chatham
   c. State and Zip Code: MA
   d. Class location: ☐ 1 ☐ 2 ☒ 3 ☐ 4
   e. Incident on Federal land: ☐ Yes ☒ No
3. Time and date of Incident: 1161513 hr. 101 mo. 30 day 0121 yr.
4. Reason for reporting
   - ☐ Fatality — Number 1 1 1 persons
   - ☒ Injury requiring inpatient hospitalization — Number 1011 persons
   - ☐ Property damage/loss — Estimate $ _____
   - ☐ Operator judgment/emergency action
   - ☐ Supplemental Report
5. Elapsed time until area was made safe: 012 hr. 001 min.
6. Telephone Report: 1101 mo. 311 day 0121 yr.
7. a. Estimated pressure at point and time of incident (PSIG) 52
   b. Maximum allowable operating pressure (MAOP)(PSIG) 60
   c. MAOP established by
      (1) Test pressure 90 (PSIG)
      (2) 49 CFR § 192.619 (a)(3) ☐

PART 2 - APPARENT CAUSE

☐ Corrosion (Continue in Part A) ☒ Damage by Outside Forces (Continue in Part B) ☐ Construction/Operating error (Continue in Part C) ☐ Other _____
☐ Accidentally caused by operator (Continue in Parts B and/or C)

PART 3 - NARRATIVE DESCRIPTION OF FACTORS CONTRIBUTING TO INCIDENT (Attach additional sheet(s) as necessary)

Third party damage during construction of a stake supported footbridge for a home. The stake pierced through the 1" CTS service line allowing escape of natural gas.

PART 4 - ORIGIN OF THE INCIDENT

1. Part of system where incident occurred
   ☐ Main ☐ Meter Set Assembly
   ☒ Service Line ☐ Other _____
2. Component which failed
   a. Part
   ☒ Body of pipe ☐ Valve
   ☐ Joint type ☐ Regulator/meter
   ☐ Fitting ☐ Weld (Specify) _____ (girth, longitudinal, fillet)
   ☐ Drip/Riser ☐ Other _____
3. Material involved:
   ☐ Steel ☐ Cast Iron
   ☒ Polyethylene plastic ☐ Other plastic: _____
   ☐ Other _____
   Nominal pipe size (NPS) CTS 1.010 in. Wall thickness .090 in.
4. Specification TC 2406 Manufacturer Driscopipe Yr Manufactured 2001 Yr Installed 2002

PART 5 - ENVIRONMENT

Area of Incident
☐ Within/Under bldg ☐ Under pavement ☐ Above ground ☒ Under ground or Under water ☐ Other _____

PART 6 - PREPARER AND AUTHORIZED SIGNATURE

Stanley T. Kastanas, Manager Regulatory Compliance 617 723-5572
(type or print) Preparer's Name and Title — Area Code and Telephone Number

Stanley T. Kastanas
Authorized Signature

11/26/02 — Date
978-815-8909 — Area Code and Telephone Number

Form RSPA F 7100.1 (3-84)

Reproduction of this form is permitted.

Exhibit 1: U. S. Department of Transportation Incident Reporting Form (2 of 3)

PART A - CORROSION N/A

1. Where did the corrosion occur?
   - ☐ Internally
   - ☐ Externally
2. Visual Description
   - ☐ Localized pitting
   - ☐ General corrosion
   - ☐ Other _____
3. Cause
   - ☐ Galvanic
   - ☐ Other _____
4. Pipe coating information
   - ☐ Bare ☐ Coated
5. Was corroded part of pipeline considered to be under cathodic protection prior to discovering incident?
   - ☐ Yes Year protection started ____
   - ☐ No
6. Additional information:

PART B - DAMAGE BY OUTSIDE FORCES

1. Primary cause of incident
   - ☐ Damage resulted from action of operator or his agent.
   - ☒ Damage resulted from action by outside party/third party.
   - ☐ Damage by earth movement
     - ☐ Subsidence
     - ☐ Landslide/washout
     - ☐ Frost
     - ☐ Other _____
   - ☐ Damage by lightning or fire
2. Locating information (for damage resulting from action of outside party/third party)
   a. Did operator get prior notification that equipment would be used in the area?
      - ☐ Yes Date received ____ mo. ____ day ____ yr.
      - ☒ No
   b. Was pipeline location marked either as a result of notification or by markers already in place? N/A
      - ☐ Yes ☐ Permanent markers ☐ Temporary stakes ☐ Other _____
      - ☐ No
   c. Does statute or ordinance require the outside party to determine whether underground facility (ies) exist?
      - ☒ Yes
      - ☐ No
3. Additional information:

No record of Dig-Safe (one-call-system) exists to verify any notification to KeySpan. (This was confirmed with Dig Safe)

PART C - CONSTRUCTION DEFECT N/A

1. Cause
   - ☐ Poor workmanship during construction
   - ☐ Physical damage during construction
   - ☐ Operating procedure inappropriate
   - ☐ Other _____
   - ☐ Error in operating procedure application
2. Additional Information:

PART D - OTHER

Brief Description:

Contractor or contractors representative or subcontractor, drove a stake through 1" CTS service line. The escaping natural gas apparently traveled through a conduit that terminated in the home's crawlspace. There was an initial ignition, but it appears that any fire was sustained by electrical wiring or other materials and was subdued by contractor. Contractor was not injured by initial ignition, but inhaled smoke when he returned to put out fire.

Form RSPA F 7100.1 (3-84)

Exhibit 1: U. S. Department of Transportation Incident Reporting Form (3 of 3)

THE COMMONWEALTH OF MASSACHUSETTS

OFFICE OF CONSUMER AFFAIRS AND BUSINESS REGULATION

DEPARTMENT OF TELECOMMUNICATIONS & ENERGY

ONE SOUTH STATION

BOSTON, MA 02110

(617) 305-3500

FILE

JANE SWIFT
GOVERNOR

JENNIFER DAVIS CAREY
DIRECTOR OF CONSUMER AFFAIRS
AND BUSINESS REGULATION

PAUL B. VASINGTON
CHAIRMAN

JAMES CONNELLY, ESQ.
COMMISSIONER

W. ROBERT KEATING
COMMISSIONER

EUGENE J. SULLIVAN, JR.
COMMISSIONER

DEIRDRE K. MANNING
COMMISSIONER

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

December 30, 2002

Solid Earth Technologies
3 Howe Drive, Unit 3
Amherst, NH 03031

SUBJECT: NOTICE OF PROBABLE VIOLATION

To Whom It May Concern:

Based on information submitted to the Department of Telecommunications and Energy ("Department"), the Department has reason to believe that you performed excavations on or about October 30, 2002, on Marshview Road, West Chatham, without complying with the provisions of Chapter 82, Section 40 of the General Laws ("Dig Safe Law").

In a report submitted by KeySpan Energy Delivery, it is alleged that you failed to tender proper notification to the underground utility operators and failed to exercise reasonable precaution which resulted in damage to an underground utility operated by that company at the location and on the date indicated in the preceding paragraph.

If you are found to have violated the "notification provision" of the statute and/or the "reasonable precaution" provision, you will be required to pay a civil penalty of $500.00, being a first offense within the past 12-month period.

You have a right to appear before a Department Investigator in an informal conference on January 28, 2003 at 9:15 A.M., at the Department's offices at One South Station, 2nd floor, Boston. You have a right to be represented at the informal conference by an attorney or other

Exhibit 2: NOPV sent to Solid Earth Technologies (1 of 3)

FILE

person, and you have the right to present relevant documents to the Investigator at the conference. At the informal conference, the Investigator will make available to you any evidence which indicates that you may have violated the law, and you will have the opportunity to rebut this evidence.

If you wish to dispute the allegations in this notice but do not want to come to the informal conference, you may respond to the Department at the above address a written reply to this notice. This written reply must be filed with the Department on or before January 28, 2003, and must be signed by you. The reply must include a complete statement of all relevant facts to include:

(1) Proof that proper notification was tendered to the operator(s) prior to excavating. This proof may be in the form of a proper Dig Safe number or a copy of a certified letter to each operator with facilities in that area.

(2) In the cases where an underground operator's facilities sustained damage, a complete description of the precautions you took to protect the underlying facilities and why those precautions failed.

If you do not choose to dispute the violations alleged in this notice, you should sign and return the enclosed consent order. The consent order must be accompanied by the check or money order for $500.00, being a first offense within the past 12-month period, made payable to the Commonwealth of Massachusetts, and mailed to the Department of Telecommunications and Energy, Pipeline Engineering and Safety Division, One South Station, Boston, MA 02110.

If you do not respond to this notice as specified above by January 28, 2003, you will be deemed to have admitted the allegations and will be subject to statutory civil penalties.

If you have any questions concerning this notice, please direct your inquiries to Virgil Glenn at (617) 305-3537. Also direct all written responses to Mr. Glenn at the above address or you may fax your response to (617) 478-2589.

Very truly yours,

for Robert F. Smallcomb

Robert F. Smallcomb
Director

RFS/dh
Enclosure

Exhibit 2: NOPV sent to Solid Earth Technologies (2 of 3)

NO #
NO PKR

MASSACHUSETTS DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY
PIPELINE ENGINEERING AND SAFETY DIVISION

FILE

REPORT OF DIG-SAFE VIOLATION AND/OR
DAMAGE TO UNDERGROUND FACILITIES

Date: 11-18-02

Reporting Party/Telephone No.: KeySpan Energy Delivery (617) 723-5512

Mailing Address: One Beacon Street, Boston, MA 02108

Person Reporting: Deane M Moore (Tel. (617) 723-5512 X4521)

Location, Date and Time of Incident: 82 Marshview Rd., West Chatham 10-30-02

Operator of Underground Facility: KeySpan Energy Delivery - Cape Division

Facility Sitting: [ ] In a public way [✓] On private property

Injury Occurred: [ ] Yes [✓] No If yes, describe:

Damage Occurred: [✓] Yes [ ] No If yes, provide a technical description of the damaged facility to include: Type of facility (service, main, other), material, pressure/voltage, depth of cover, repair costs and other pertinent data:

1" plastic service Pressure H.P. Depth:

Estimated cost of repairs: $ 773.41 Surface Removed: [ ] Yes [ ] No

Year of installation (If less than 12 months, provide month and year.)

Description of activity causing damage, citing any lack of precautions:

Contractor damaged service installing support posts

Were marks within 18" of facility?: [ ] Yes [✓] No
Were photographs taken?: [✓] Yes [ ] No
Is the excavator being held liable for damages?: [✓] Yes [ ] No

When was the incident reported and by whom?: 10-30-02 Contractor

Excavation Company: Solid Earth Technologies Tel. No.: 603-882-5319
Address: 3 Howe Dr Unit 3, Amherst N.H. Zip: 03031
Equipment/Registration No.: post digger Operator:

Dig-Safe Number: None found Attach Dig-Safe message, if applicable.

If additional remarks are necessary to fully describe the disposition of the above, please attach a separate sheet.

✓

Exhibit 2: NOPV sent to Solid Earth Technologies (3 of 3)

The Commonwealth of Massachusetts

DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

FILE

CONSENT ORDER

1. This document is a consent order entered into between the Department of Telecommunications and Energy of the Commonwealth of Massachusetts ("Department") and Solid Earth Technologies ("Respondent").

2. The Department finds that a violation occurred on October 30, 2002, on Marshview Road, West Chatham.

3. Pursuant to 220 C.M.R. § 99.11(1), this Consent Order need not constitute an admission by the Respondent that a violation occurred.

4. The Department, pursuant to the terms of this Consent Order, hereby imposes upon the Respondent a civil penalty of $500.00, being a first offense, pursuant to G.L. c. 82 § 40A, § 40E, and 220 C.M.R. § 99.12. The Respondent hereby agrees, upon signing and returning this Consent Order to the Department, to attach payment of the penalty by check or money order payable to the Commonwealth of Massachusetts.

5. The Department and the Respondent also agree that this Consent Order shall constitute a final Order of the Department. The Respondent hereby expressly waives any and all right of appeal or right of judicial review that might otherwise attach to a final Order of the Department.

1-7-03
Date

PRESIDENT
Solid Earth Technologies

1-14-03
Date

Robert F. Smallcomb
Director
Pipeline Engineering & Safety Division
Department of Telecommunications and Energy

Exhibit 3: Consent Order signed by Solid Earth Technologies (1 of 2)

FILE

5247
2637

NAME SOLID EARTH TECHNOLOGIES
ADDRESS
SHIP TO
ADDRESS

ORDER NO.	TERMS	DATE
PIPELINE		1/14/03

WHEN SHIP	SALESMAN	BUYER	HOW SHIP

500 00 DIG SAFE VIOLATION

DEPT OF
TELECOMM
AND ENERGY

01/14/03 12:53PM
000#7259 8

DIG SAFE $500.00

CHECK $500.00

TOPS FORM 46510

Exhibit 3: Consent Order signed by Solid Earth Technologies (2 of 2)

CHATHAM FIRE-RESCUE & EMERGENCY SERVICE DEPARTMENT

William Schwerdtfeger
Chief of Department

FAX COVER SHEET

DATE: 11/1/02

TO: PAUL

FAX: 617-478-2589

COMPANY:

FROM: R. HUNTER, DEPUTY

Number of Pages (including cover sheet) 3

Comments:

135 DEPOT ROAD – CHATHAM, MA 02633
(508) 945-2324 – FAX (508) 945-5120

new FAX cover sheet

Exhibit 4: Investigative Report by the Chatham Fire Department (1 of 3)

INVESTIGATIVE REPORT

Incident #021905
31 October 2002
82 Marshview Rd
West Chatham
Structure Fire

The following narrative is based upon an interview conducted with Mr. Leonard Savery at the Intensive Care Unit of Cape Cod Hospital, on this date.

Mr. Jeffrey Taylor, owner of the property visited the dwelling during the morning of Wednesday, 30 October. Sometime between 1200 & 1300 hours, Mr. Taylor called Mr. Savery and asked his to check an unknown odor in the house.

At approximately 1515 hours, Mr. Savery visited the dwelling. He states he did not notice an odor of natural gas as he crossed the marsh or approached the dwelling. He entered the dwelling and stated he did not notice an odor of gas. He then went to the bed room, opened the access hatch to the basement crawl space and proceeded down the steps, turning on the light switch as he did so. He looked around, saw nothing, and smelled an unusual odor, which he did not attribute to gas. He then climbed the steps, turning off the light switch as he did so. There was an immediate flash fire which he described as being very small. He looked down into the basement and saw what he thought to be paper burning on a shelf area. He reached down and brushed the burning material onto the floor with his hand. He then proceeded to the kitchen and began to place a call the Chatham Fire & Rescue Department. As he did so the other telephone line rang and he hung up and answered. The call was from the alarm company inquiring if help was needed as they were receiving an alarm from the dwelling. Before he could answer, he looked back in the direction of the bedroom and observed flames and heavy black smoke emitting from the open hatch. He hung up, located a small (dry chemical) fire extinguisher and attempted to contain the fire, without success. He then went outside and located a garden hose which he connected to and outside faucet. He returned to the bedroom door, observed an even greater volume of fire and smoke emitting from the opening, took a deep breath and entered the bedroom. He then sprayed water on the fire for as long as he could stand the smoke. He did this several time until he no longer saw any fire. Shortly thereafter he met Captain Roy Eldredge in front of the dwelling.

When questioned about the installation of the gas line to the island, he stated Bay State Gas Company did the installation in February of 2002. When questioned about the installation of the "screw piers" the new supports for the 400 +/- long footbridge, connecting the island to the main land, he stated Solid Earth Technologies of Amhurst, N.H., had installed most of the piers some six months ago. He went on to state the company had been working the site on Monday, Tuesday and Wednesday of this week, and that on Wednesday afternoon, he received a call from Mike Parkhurst, superintendent of the Solid Earth Technologies company, inquiring where the gas line was, since some work was required on the piers.

Exhibit 4: Investigative Report by the Chatham Fire Department (2 of 3)

NSTAR Gas Company conducted an investigation which included the removal of the underground gas service from the sleeve under the marsh. They determined the gas line had been damaged by the pier, causing a leak approximately twenty feet from the island out in the marsh.

It is believed the gas emitting from the damaged pipe migrated to the island and found its way into the basement by one of two avenues. One was via the sleeve in which the gas lien was contained. In this scenario, the gas exited the end of the sleeve some ten feet from the dwelling, underground, then migrated into the basement. In the other, the sleeve containing the electric service was also damaged, and the gas entered the basement directly through the electric service panel. No effort has been made to determine if the electric sleeve has been damaged.

It is reported Dig Safe was not initiated prior to the installation of the screw piers.

Well after Mr. Savery was transported to the hospital, this department checked the basement with a combustible gas meter and found the LEL to be 89%. Natural gas has an ignition parameter of 5 to 15%, and it is believed the initial high concentration of natural gas in the basement prevented an ignition as Mr. Savery entered. The "venting" of the basement by opening the hatch, at least in the area of the switch, which is located just inside the hatch way, reduced the concentration of gas to a level conducive to ignition.

William Schwerdtfeger
Chief of Department

Exhibit 4: Investigative Report by the Chatham Fire Department (3 of 3)

EXAMPLE 2A – 2 of 2

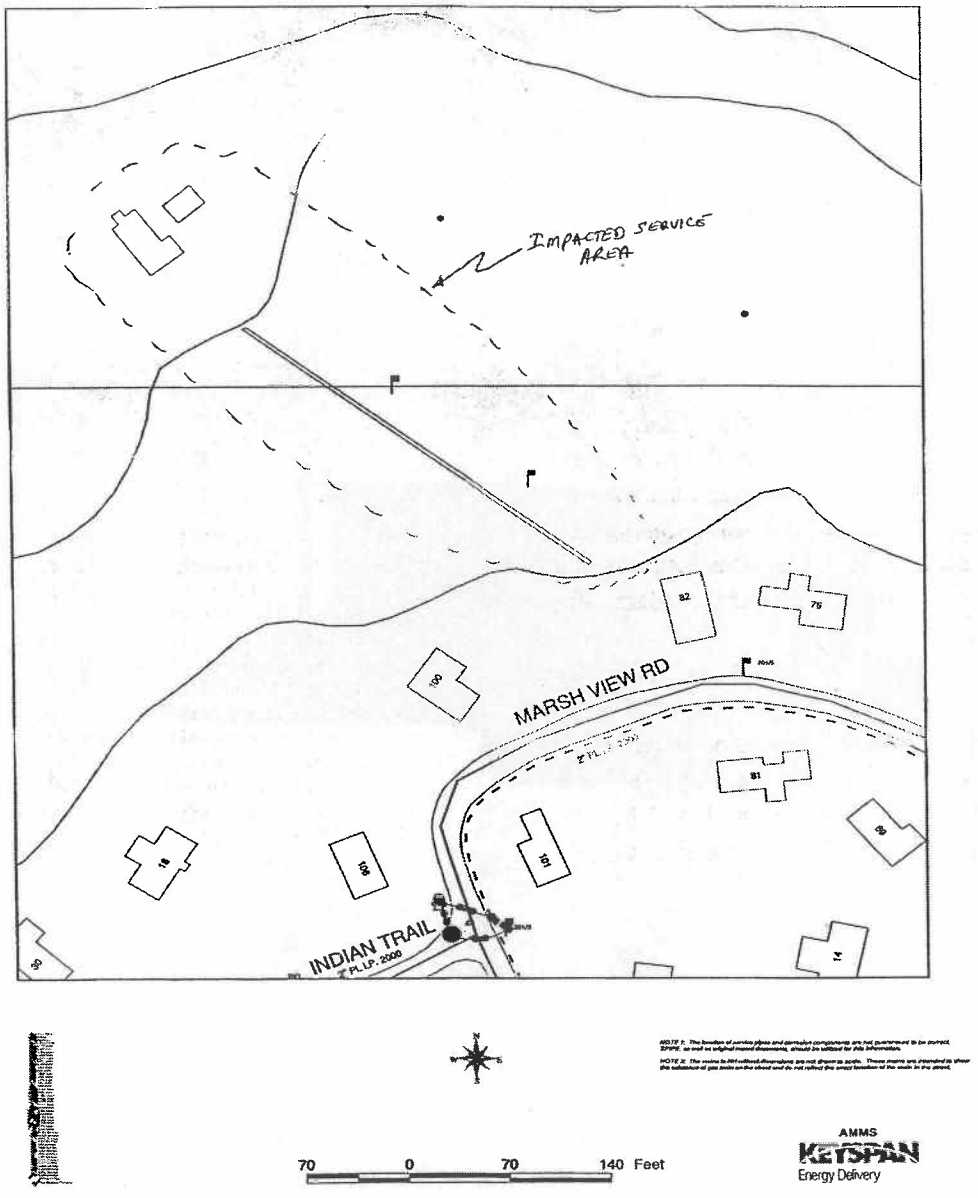


Exhibit 5: Map of Marsh View Road, Chatham, showing the location of the two-inch diameter main and the conduit through the marsh.

Example 2D - OPERATING

Telemetry Location	Press (PSIG)	Date	Time			
CMSC_CHATHAM_PRESS	54.18	10/30/02	11:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.65	10/30/02	12:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.73	10/30/02	13:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.24	10/30/02	14:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.88	10/30/02	15:00	AVERAGE	Data is valid	No Alarm - OK
INCIDENT → CMSC_CHATHAM_PRESS	52.37	10/30/02	16:00	AVERAGE	Data is valid	No Alarm - OK ← INCIDENT
CMSC_CHATHAM_PRESS	52.30	10/30/02	17:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.50	10/30/02	18:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.33	10/30/02	19:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.68	10/30/02	20:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.95	10/30/02	21:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.49	10/30/02	22:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	54.00	10/30/02	23:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	54.00	10/31/02	0:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	54.00	10/31/02	1:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.98	10/31/02	2:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.57	10/31/02	3:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.20	10/31/02	4:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.56	10/31/02	5:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	51.24	10/31/02	6:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	51.41	10/31/02	7:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	52.44	10/31/02	8:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	53.91	10/31/02	9:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	54.78	10/31/02	10:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	55.11	10/31/02	11:00	AVERAGE	Data is valid	No Alarm - OK
CMSC_CHATHAM_PRESS	55.70	10/31/02	12:00	AVERAGE	Data is valid	No Alarm - OK

Exhibit 6: Telemetry reports of pressure readings at locations near Marsh View Road at the time of the incident.

Exhibit 7: View of the marsh, the walkway to the island and the island.

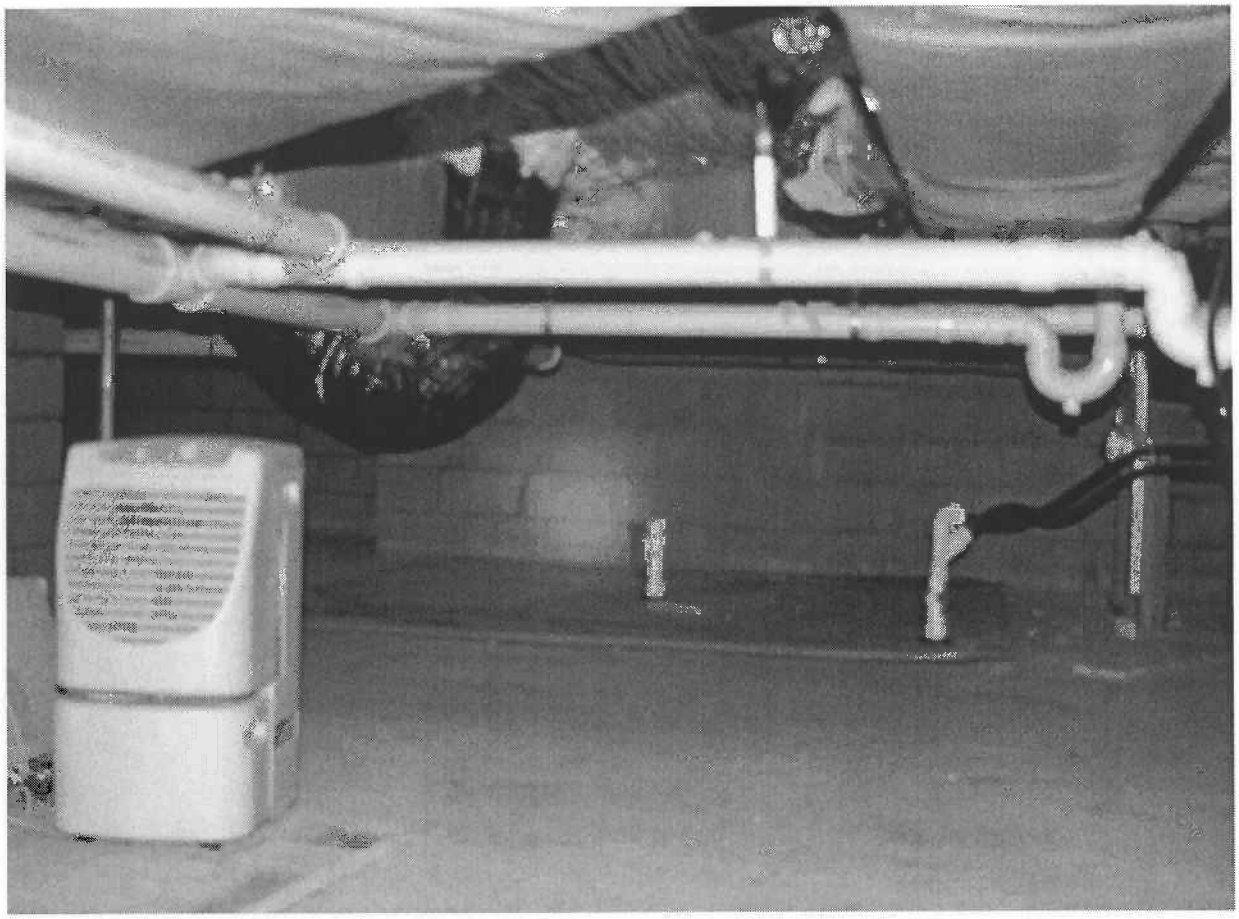
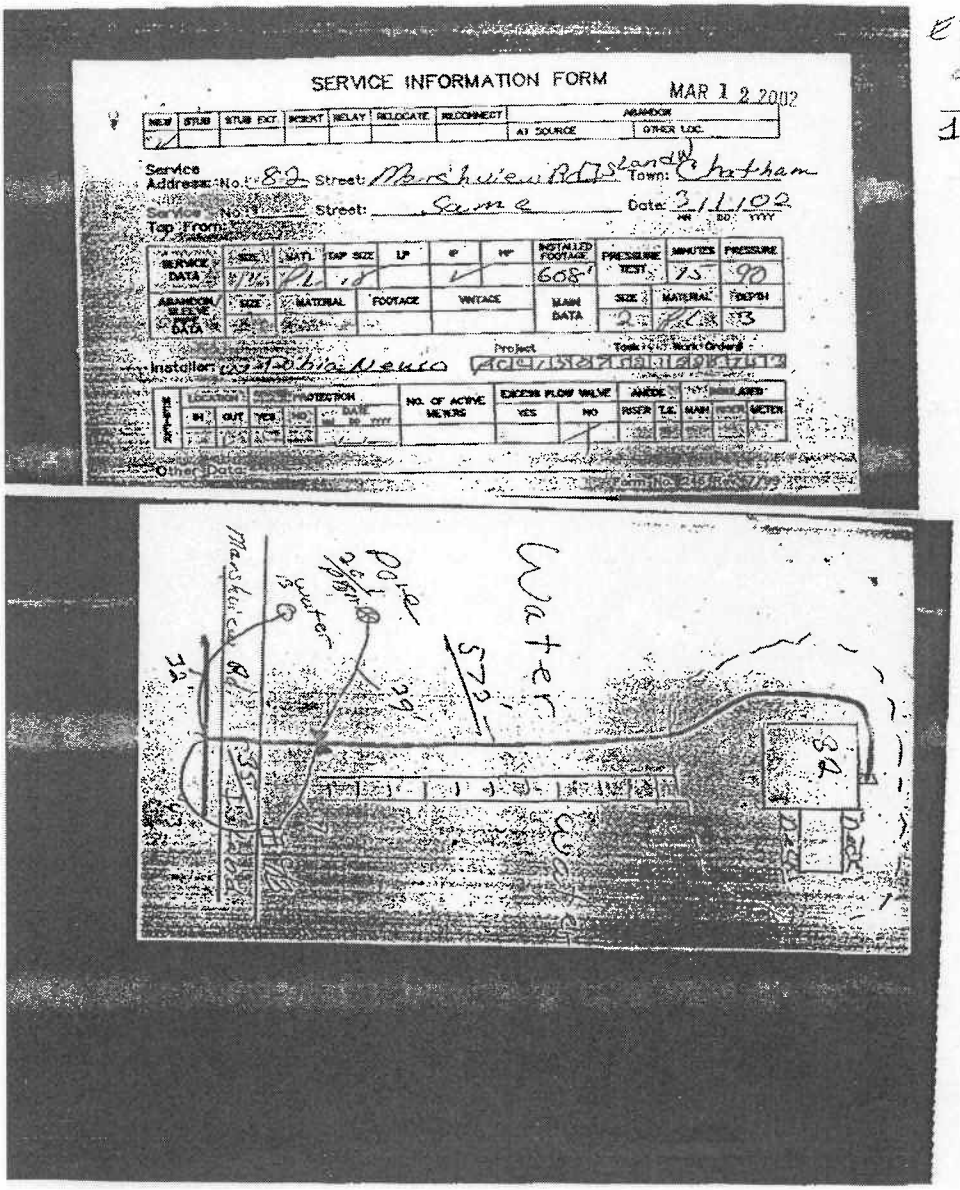


Exhibit 8: View of the half-basement.

OCT-31-2002 THU 07:31 AM KEYSPAN ENERGY FAX NO. 19783223606 P. 01

EXAMPLE 2A 1 of 2



SERVICE INFORMATION FORM

MAR 1 2 2002

Service Address: No.: 82 Street: Marshview Rd Town: Chatham

Service No.: Street: Same Date: 3/1/02

Tap From:

Installer: Colonial Penn

Other Data:

Exhibit 9: Installation records of the service line to #82 Marsh View Road.

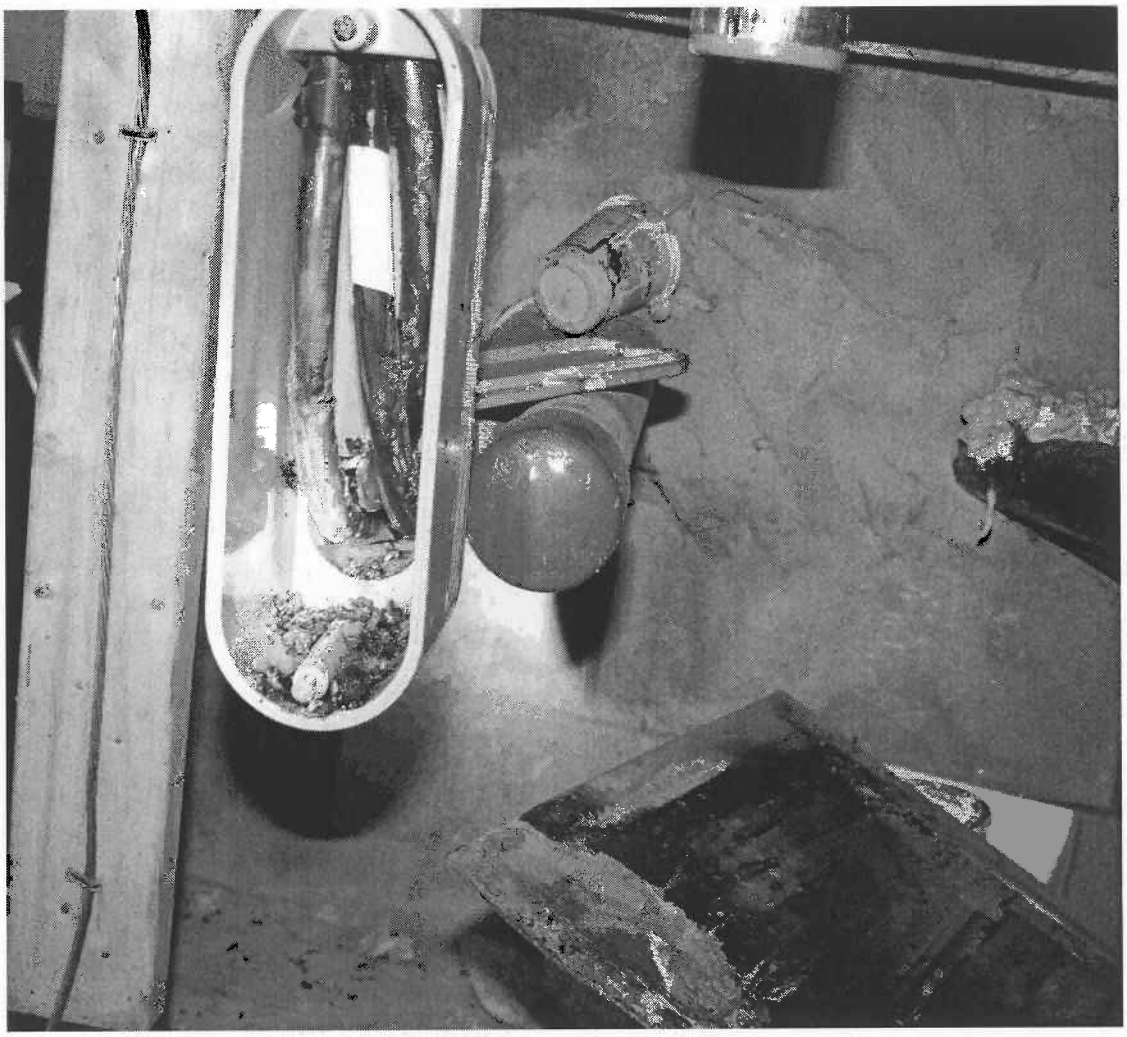


Exhibit 10a: View of electric conduit in the half-basement.

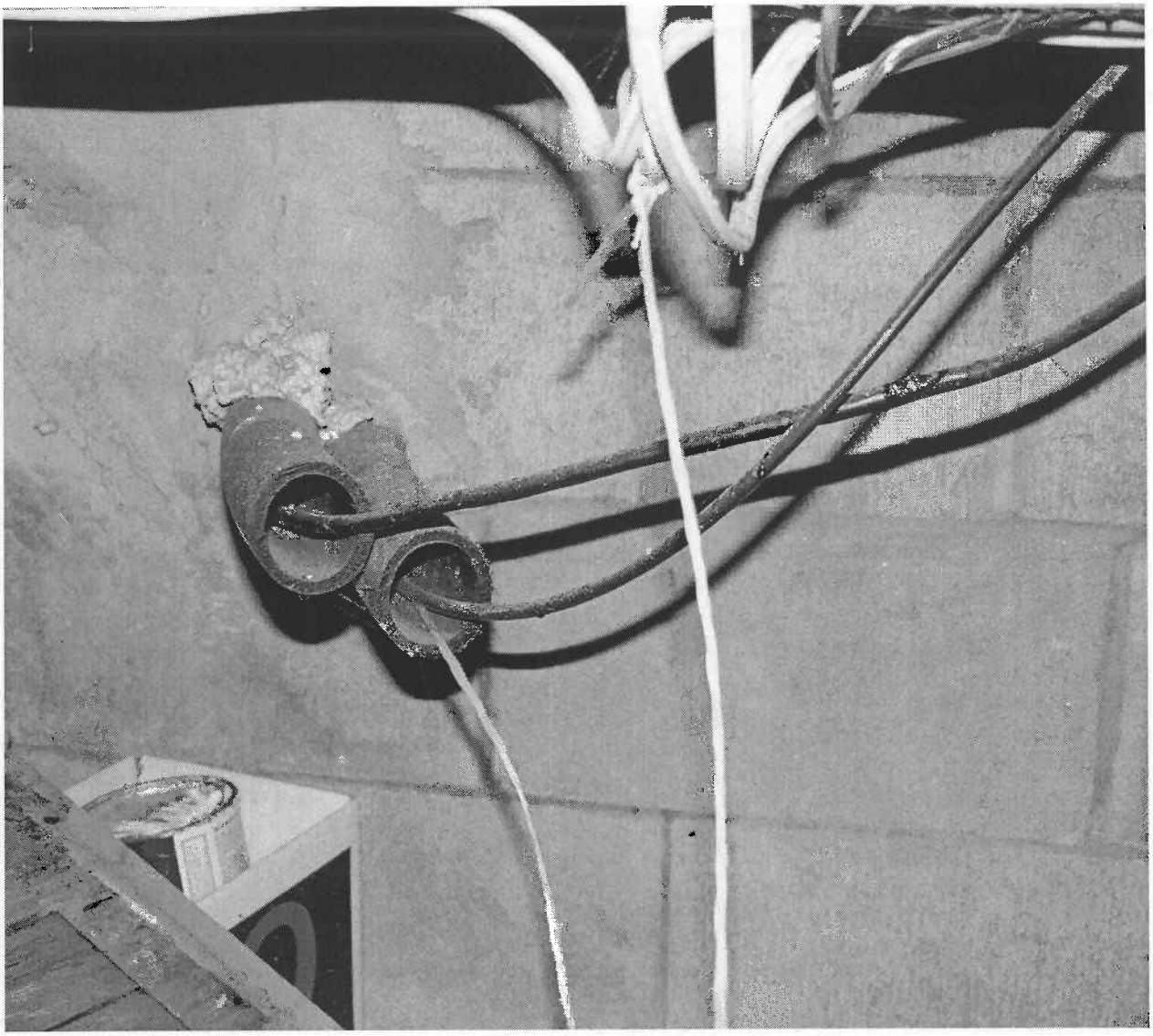


Exhibit 10b: View of the telephone conduit in the half-basement.

EXAMPLE 4

UNDERGROUND DAMAGE REPORT

Mon	Day	Yr	Project#	Task	Work Order#
10	7	02	CPEV1Z	42PS	2F7856

LOCATION: STREET ADDRESS 84 Meadow View Rd CITY/TOWN W. Chatham

FACILITIES DAMAGED: [ ] MAIN [x] SERVICE OTHER ______

SIZE 1" PRESSURE [ ] LOW [ ] I.P./M.P. [x] H.P.

[ ] STEEL [x] PLASTIC [ ] C.I. [ ] COPPER

DEPTH FROM ORIGINAL GRADE 2'-8'

CONTRACTOR/EXCAVATOR'S NAME Solid Earth Tech.

CONTRACTOR'S ADDRESS 3 Howe Dr. unit 3 Amherst N.H. 03

EQUIPMENT CAUSING DAMAGE Post for new walkway

REGISTRATION OF EQUIPMENT ______

MARKINGS ON EQUIPMENT Phone # 877-389-782

OF OPERATOR ______

CONTRACTOR DIG SAFE # ______

FACILITY LOCATION [ ] PUBLIC PROPERTY [x] PRIVATE PROPERTY

GAS MARKINGS VISIBLE [ ] YES [x] NO

METHOD OF MARKOUT [ ] OFFSET [ ] CENTER LINE

[ ] STAKES [ ] FLAGS

IF MARKINGS ARE VISIBLE ARE MARKINGS CORRECT [ ] YES [ ] NO

DISTANCE MARKINGS OFF ______

SURFACE TYPE [ ] ASPHALT [ ] GRAVEL [x] GRASS (Marsh) [ ] CONCRETE/BRICK

SURFACE REMOVED [ ] YES [x] NO

PICTURES TAKEN [x] YES [ ] NO

THIS REPORT BY Coulter/Gilbert (PLEASE PRINT) TITLE M/F - Superv

Exhibit 11: KeySpan Underground Damage Report (1 of 2)

NATURE OF WORK

- [ ] SEWER
- [ ] WATER
- [ ] ROAD CONSTRUCTION
- [ ] CONDUIT INSTALLATION
- [ ] LANDSCAPING
- [x] OTHER walkway

NATURE OF ACTIVITY

- [ ] EMERGENCY
- [x] NON-EMERGENCY

WAS GAS SHUT OFF BY FLOW LIMITER [ ] YES [x] NO

SIZE OF HOLE IN PIPE (FOR VOLUME LOSS CALCULATION) 1/4" slice

TIME MADE SAFE (NEED FOR LOSS OF GAS CALCULATION) 19:15

DESCRIPTION OF INCIDENT

Called to location for past explosion, upon arrival found class I leak, 70% at foundation 1" plastic service had been damaged by contractor installing support posts for new walkway over marsh area. Turned off at gate box to make safe, T/off at river mrco Dug hole at 100% reading 20' from house, found end of 2" sleeve, left hole open to vent gas away from house.

CONTRACTOR DIG SAFE INFORMATION
FOR OFFICE USE ONLY
Compliance with M.G.L., C. 82, S. 40 as Amended:

Dig Safe No. __________ Date Reported _____

72 Hour Did Safe Notice [ ] Yes [ ] No

Dis Safe Violation [ ] Yes [ ] No

CLAIM TO BE MADE [x] Yes [ ] No

PICTURES TAKEN BY FIELD SUPERVISOR [x] Yes [ ] No

GROUP LEADER Coulter DATE 10/30/02

FORM NO. 1174A REV. 8/99

Exhibit 11: KeySpan Underground Damage Report (2 of 2)

Exhibit 12: View of the gas meter and regulator located outside of the house.

Exhibit 13a: View of some of the fire damage to the electrical wiring.

Exhibit 13b: View of fire damage to the wood structure, insulation and electrical wiring.

Exhibit 14: Close up view of the house. Orange cones show the location near the end of the sleeve where the service was cut and capped.

Exhibit 15: View of the service where it was cut and capped on the island.

Exhibit 16: Service line being pulled out of the sleeve.

Exhibit 17: View of the service pipe showing the puncture and scratches.

EXAMPLE 2

KEYSPAN Energy Delivery

LEAK INVESTIGATION REPORT

PREMARKED DATE: _____ PROJECT # _____

DATE: 10/30/02 REPORTED BY: CONTRACTOR/FIRE TIME TAKEN: 5:30 PM LEAK # _____

ADDRESS: 84 MARSH VIEW AVE CITY / TOWN: CHATHAM JOB # _____

LEAK CLASSFICATION	
Grade I	✓
Grade II	
Grade III	

LEAK STAND-BY	
Yes	✓
No	

PREMISE CONDITION REPORT	
Yes	
No	✓

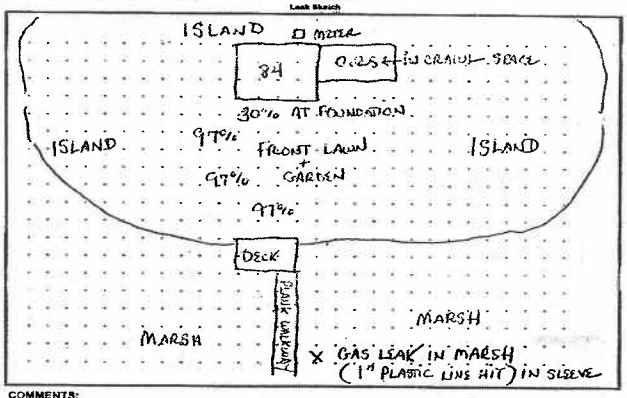
TYPE OF AREA	
Rural	
Residential	✓
Urban	

PRESSURE	
High	✓
Intermediate	
Low	

ODOR PRESENT	
Yes	✓
No	

SURVEY TYPE / PROJECT #	
Public 136	
Employee 136	
Winter Patrol 146	
Summer F.I. 140	
Walking 144	
Re-Check 132	
C.I. Encroachment 128	
Prepave 134	
Special 138	
Contractor 142	✓
Building 130	
Business District 130	

Leak Sketch



CGI TEST		
Positive	97 %	✓
Negative		

LEAK APPEARS TO BE ON	
Main	
Service	✓
Drip	
Curb Valve	
Main Valve	
Other	

METHOD OF TEST	
Portable F.I.	
Mobile F.I.	
CGI	✓
Selected Test	
Other	

COMMENTS:
READINGS IN CRAWL SPACE 0.25 ON ARRIVAL / 30% AT FOUNDATION
CALLED SUPERVISOR + STREET CREW
SHUT GAS OFF AFTER LEAK WAS LOCATED
GAS LEAK WAS MIGRATING THROUGH SLEEVE TO HOUSE FROM MARSH

COVER	
Asphalt	
Concrete	
Brick	
Gravel	
Soil	✓
Other	✓

CONTACTED:

	Y	N
CREW LEADER		
SUPERVISOR	✓	

KEITH COLTER

STEVE) CALLAGHAN — 25350
COMPANY REPRESENTATIVE — EMPLOYEE #

CONSULTANT REPRESENTATIVE — COMPANY

GAS DETECTED IN	
Atmosphere	✓
Bar Hole	✓
Manhole	
Valve Box	
Main Valve	
Curb Valve	
Thru Foundation	✓

Exhibit 18: KeySpan Leak Investigation Report (1 of 3)

PREMISE INVESTIGATION SUMMARY
(FOR E.R.U. USE ONLY)

LIST ALL ADDRESSES IN THE ORDER THAT THEY WERE CHECKED

	ADDRESS	READ	COMMENTS
1	84 Mesa View	0%	30# AT [illegible]
2			
3			
4			
5			
6			
7			
8			
9			
10			
14			
15			
16			
17			
18			
19			
25			
26			
27			
28			
29			

LEAK MONITORING RESULTS

	DATE	READ	COMMENTS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

LEAK INVESTIGATION COMPLETED

YES ☑
NO ☐

START TIME 5:30
END TIME 11:00
TOTAL TIME 5.5

COMMENTS:

Exhibit 18: KeySpan Leak Investigation Report
(2 of 3)

KEYSPAN Energy Delivery

FAX

INCIDENT / LEAK FORM CPE 136

Date	Time	Reported By	Taken By	Area	Job #	Leak #	Grade
10-30-02	1652	Chm Fire Dept	24608		283856		1

Customer Name	Street #	Pre	Street Name	Suf	Suite	Town
	82		Marshview	Rd		Chm

@ INTERSECTION OF:	Pre	Intersecting Street	Suf

Remarks: inside .25 is a Flanged Gen. Cont. Turned on lights + gas ignited in Basement 30% at outside foundation wall
Strong odor outside (all in street @ 1913)

S-rep 25350 / Rep. to Cape Cod Nursing (Len Savery) Contractor

Crew Name/Number	Time	Ref By	Dig Safe #	Time	Ref By
Adams / Gilbert	1849	24608	20024407286	1911	24608
Supervisor	**Time**	**Ref By**	**Legal Dept**	**Time**	**Ref By**
Jacobsen, S	1900	R. Lean	T. Valiant	1912	R. Lean
Supervisor	**Time**	**Ref By**	**Public Relations**	**Time**	**Ref By**
Coulter K	1836	1837	J. Carroll	1950	R. Lean
Dispatch Manager	**Time**	**Ref By**	**Gas Supply**	**Time**	**Ref By**
D. MacAteese	1847	R. Lean			
Director	**Time**	**Ref By**	**Fire Dept**	**Time**	**Ref By**
Ed Lee	1850	D. [illegible]			
V.P.	**Time**	**Ref By**	**Police Dept**	**Time**	**Ref By**
Damage Prevention	**Time**	**Ref By**	**Other/Follow-up**	**Time**	**Ref By**

Repair Information: Called DTE 1900 + 2030

(Example 1)

Exhibit 18: KeySpan Leak Investigation Report
(3 of 3)

Exhibit 19: KeySpan Leak Repair Work Orders
(1 of 4)

EXAMPLE 2

FWMS - WORK ORDER COMPLETION FORM

Street Address: # 81 Marshview Rd
Town: Hathaw Organization:
Start Date (mm/dd/yy): 12/30/02 Finish Date (if Diff):
Day of Week: Sun ☐ Mon ☐ Tues ☐ Wed ☑ Thur ☐ Fri ☐ Sat ☐ Crew Shift: 1st ☑ 2nd ☐ 3rd ☐

WORK TYPE
- Abandon Main
- Abandon Regulator
- Abandon Service
- Abandon St. Light
- Callback to Worksite
- Corrosion Request
- Damage Repair
- Emergency Repair
- Inspect Pipe Marker
- Inspect Pipe
- Inspect Valve
- Leak Repair
- Leak Survey
- Meter Relocate
- Meter Protect
- Misc. Other
- New Main
- New Regulator
- New Service
- New St. Light
- New Valve
- Repair St. Light
- Repair Valve
- Relay Main
- Relay Service
- St. Box Work
- Stop/Blockage
- System Uprate
- Other:

Cost Center #: C8e 142
Activity #: A 4285
Activity #: B
Activity #: C
Work Order #: 283856

Crew Leader: Gilbert Adams

Overtime Code: Extended / Call-In / Scheduled
JOB COMPLETE: FULL ☑ YES ☐ NO
Police Hours: Police Minimum? Yes ☐ No ☑

OPERATIONS STANDARD UNITS (ACTIVITIES)

Corrosion
General
Install 2 Wire Test Station
Install 4 Wire Test Station
Locate/Adjust Box
Main Anode
Main Anode & Insulator
Main Anode, Insul. & Test Sta
Main Anode & Test Sta
Main- Clear Underground
Main Insulate
Main Repair Coating
Repair 4 Wire Test Sta
Buried Pipeline Inspection
Service Anode
Svc Anode, Insul. & Test Sta
Service Anode & Test Sta
Service Insulatio
Leak Repair
Investigate
Pinpoint
Aerate/Purge

Main Work
Abandon
Adjust Box
Replace Box
Drip Repair
Joint Repair Size Lath
Minor Relay
Capital Main Relay
Broken Pipe Repair
Rusted Pipe Repair
Stoppage Repair
Valve Repair
Pipeline Marker Inspect
Valve Inspection
Misc. Operations
Dumptruck Operations
Emer. Truck Oper.
Other Misc. Operations
Street Light Work
Abandon
Repair Light
Install New

Service Work
Abandon
Adjust Box
Replace Box
Drip Repair Size Lath
Service Insert
Minor Relay
Full Relay
Rusted Pipe Repair
Stoppage Repair
Valve Repair
Install New
Relocate Meter In-Out
Meter Protection
Restoration
Pickup(PUB/PUO/PUC)
Digout Depression
Patch Depression
Other Surface Restore
Other (AO, Mtg, Trng)

Activities Completed: A ✓ B ___ C ___

CREW TIME

Activity (Circle One)	Labor Time Type: Yard Travel	Work Site	Other	Start Time	Finish Time	Crew ST Hours	Crew OT Hours
(A) B C	☑	☐	☐	1900	2030		1.0
A (B) C	☑	☑	☐	2030	2300		3.0
(A) B C	☑	☐	☐	2300	2400		1.0
A / B / C	☐	☐	☐				
A / B / C	☐	☐	☐				

(Other:AO, Mtg, Trng, Rest)
Crew I.D.: 79 - 57706
Field Supervisor:
Approved By:

MISC. WORK ORDER COMPLETION
Repair Activity ☑ A ☐ B ☐ C Leak No.

Repair Type
Leak Repair
Non-Leak Repair
Called-Off

Main / Service

Material
Plastic
Cast Iron
Bare Steel
Coated Steel
Copper
Wrought Iron
Steel
Other

Pressure
High
Medium
Intermediate
Lo
Size A: 1
Size B:
Size C:

Repair Code
Clamped
Sealed
Cut-Off
Grease Valve
Plastic Relay&Insert
Inside Leak
Repair Fitting
Steel Relay
Anaerobic Seal
Other Repair

Where Leaking
Joint
Broken Main
Leaking Pipe
Fitting
Drip
Regulator
Gate/Valve
Tap Connection
Other Location

Leak Cause
Corrosion
Damage
Matl Defect
Constr Defect
Natural Causes
Other Causes

RGO / RECONNECT / STANDBY Activity ☐ A ☐ B ☐ C
RGO's Performed: Y / N ☐ House Heater ☐ Water Heater ☐ Range ☐ Other Standby Performed: ☐ Yes ☐ No Reconnect Performed: ☐ Yes ☐ No

PRESSURE TEST RESULTS Activity ☐ A ☐ B ☐ C Chart Recorder Used: Medium
Pressure: PSIG Duration: Hrs:Min ☐ Yes ☐ No ☐ Air ☐ Hydro Test ☐ Nitrogen ☐ Other

[redacted]

FWMS - WORK ORDER COMPLETION FORM Work Order #: [redacted] Date:

Street Address: ______ Town:

Cross Street: ______

Construction Activity:
- Main Conn.
- Main Relay
- New Services
- Insert

RESTORATIONS (OPENINGS)

Opening Site (A B C)
- Street
- Sidewalk
- Lawn (Pri Prop)

Original Surface
- Asphalt
- Concrete
- Gravel
- Cobblestone
- Grass
- Brick
- Conc&Asph
- Brick&Cobble

	A	B	C	
Length:				ft.
Width:				ft.
# DCP Drops:				in.
# Lifts:				
Lift Thickness:				in.

Paving Method
- Hot Patch
- Loam&Seed
- Cust. Reimb.
- None
- Cold Patch

Paving Contr. Notified: Yes / No

Pick Ups

	Done	Req'd	Not Req'd
Dirt			
Plate(s)			
Barricade/Cone			
Spoil Bag			

Opening Sketch

FIELD SKETCH

EXPOSED PIPE (UNDERGROUND BURIED PIPE): Activity: A ✓ B C

Opened By
- ✓ Company
- Contractor

Soil Condition
- ✓ Gravel
- Sand
- Clay
- Rocky
- Ledge

Material (Main / Service)
- Plastic
- Cast Iron
- Steel
- W Iron
- Copper

Size (in.) 1"

Depth (ft.) 2'

Pipe Condition (Main / Service)
- No Corrosion
- Surface Rust
- Minor Pitting
- Deep Pitting
- Leaking

Location
- External
- Internal
- Both (E&I)

Fitting Type (Main / Service)
- Joint
- Tee
- Saddle
- Coupling
- Valve
- Other

Other:

Fitting Condition (Main / Service)
- No Corrosion
- Surface Rust
- Minor Pitting
- Deep Pitting
- Leaking

Location
- External
- Internal
- Both (E&I)

Coating Type (Main / Service)
- None (bare)
- Coal Tar (blk)
- X-Tru (yellow)
- Pritec
- TF Epoxy - Red
- TF Epoxy-Grn
- TF Epoxy-Yel

Coating Damage (Main / Service)
- None
- Minor
- Extensive

Anode Information

Anode Type
- Zinc
- Magnesium

Repair Action (Main Yes No / Service Yes No)
- Coating Repair
- Anode Installed
- Test Sta. Inst/Rep

Anode Qty: ______ Corr. Rdg. ______

Comments

Found service hit by deck pole. T/off gas at G/B. Also S/ meter.

Form No. : F-3001 (Rev. 8/99)

Exhibit 19: KeySpan Leak Repair Work Orders (2 of 4)

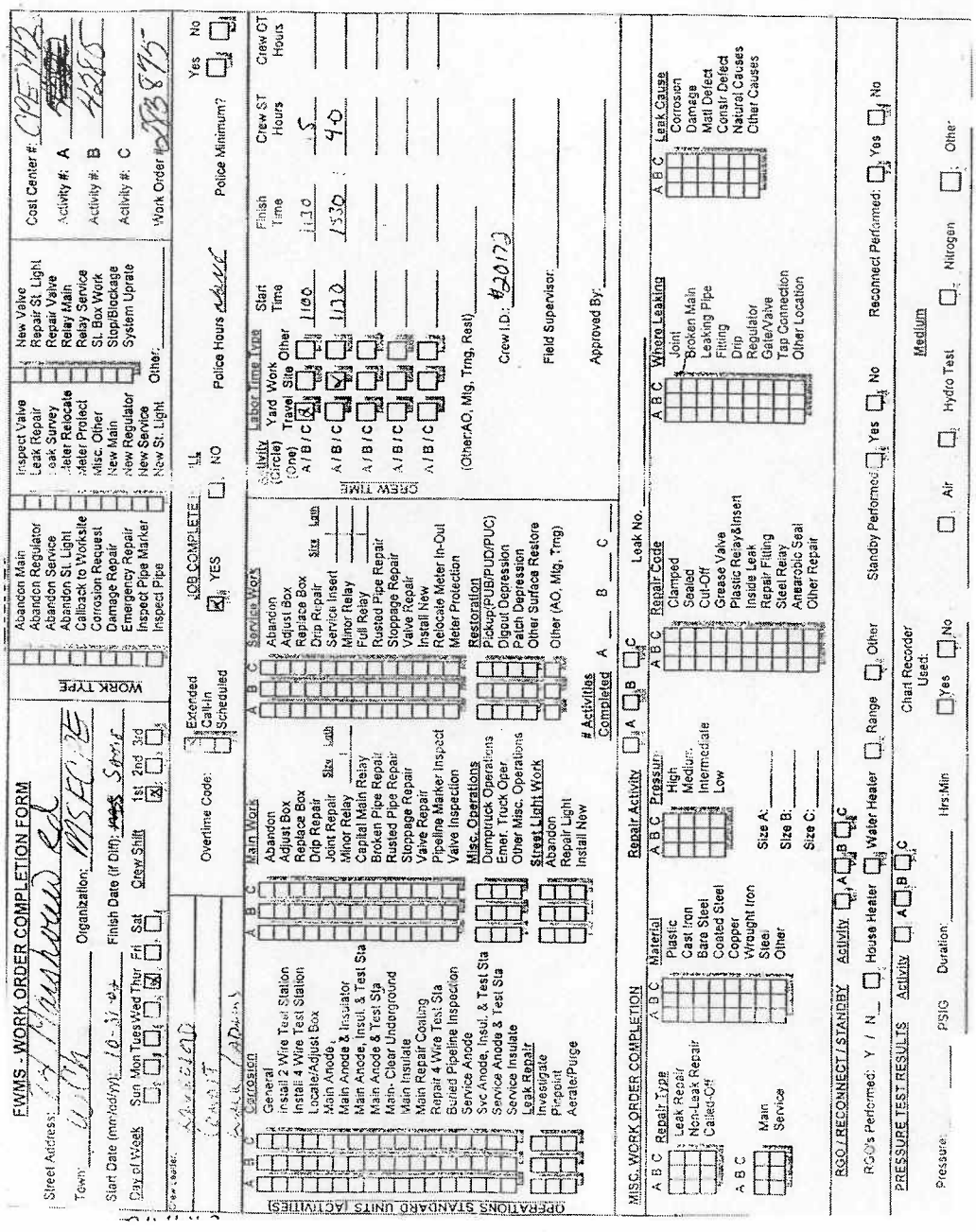


Exhibit 19: KeySpan Leak Repair Work Orders
(3 of 4)

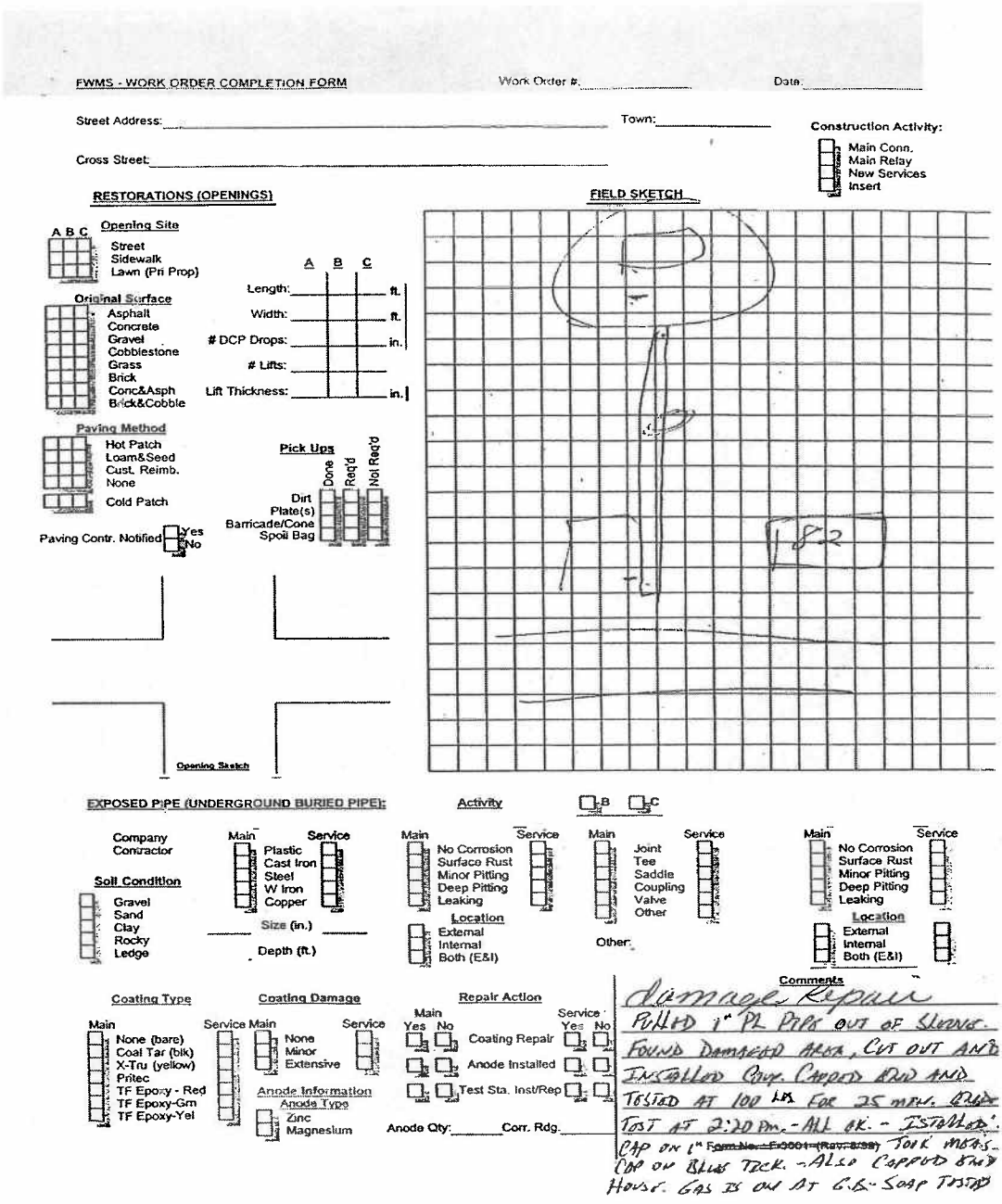
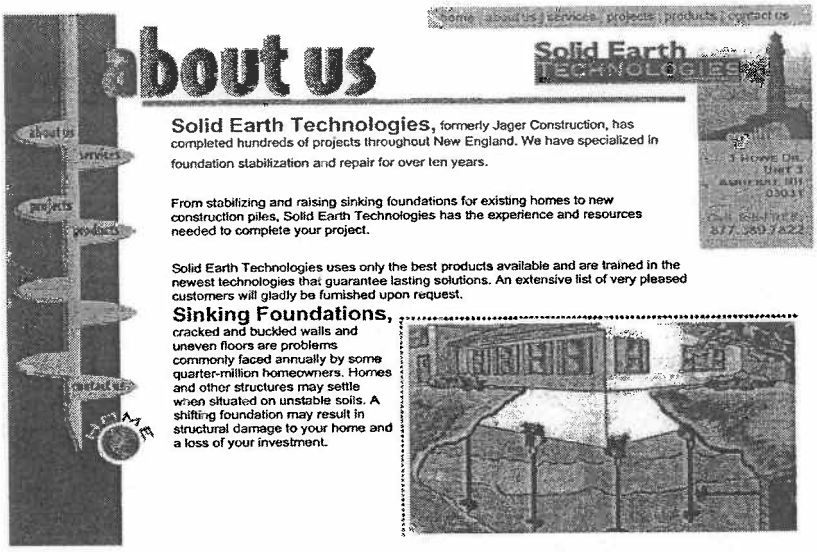


Exhibit 19: KeySpan Leak Repair Work Orders
(4 of 4)



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Solid Earth TECHNOLOGIES

Solid Earth Technologies, formerly Jager Construction, has completed hundreds of projects throughout New England. We have specialized in foundation stabilization and repair for over ten years.

From stabilizing and raising sinking foundations for existing homes to new construction piles, Solid Earth Technologies has the experience and resources needed to complete your project.

Solid Earth Technologies uses only the best products available and are trained in the newest technologies that guarantee lasting solutions. An extensive list of very pleased customers will gladly be furnished upon request.

Sinking Foundations, cracked and buckled walls and uneven floors are problems commonly faced annually by some quarter-million homeowners. Homes and other structures may settle when situated on unstable soils. A shifting foundation may result in structural damage to your home and a loss of your investment.

Exhibit 20: SET Brochure describing the piers and the installation process. (1 of 3)

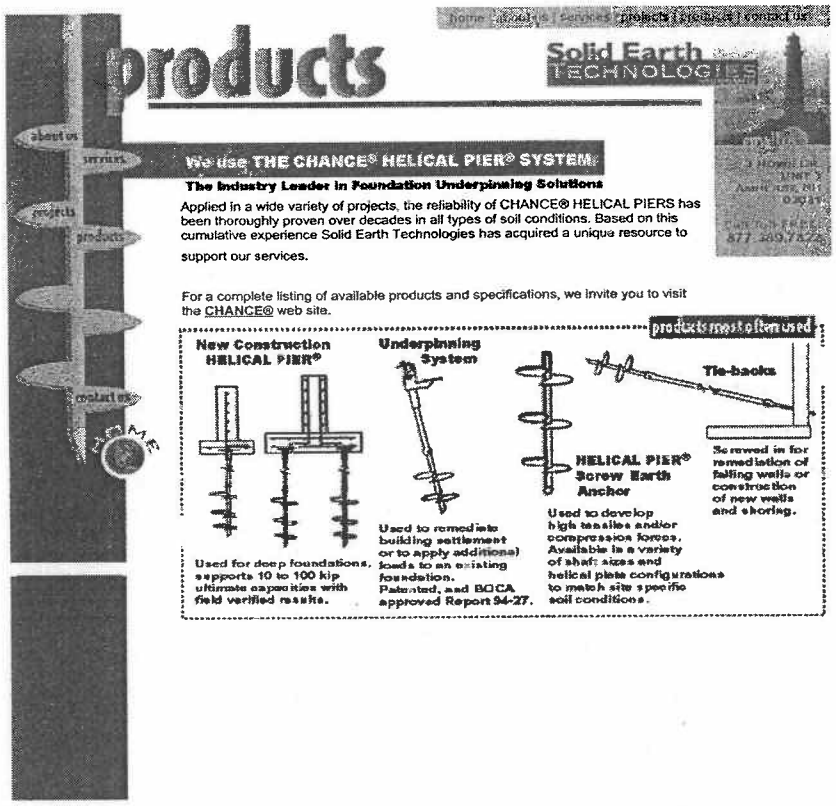

Exhibit 20: SET Brochure describing the piers and the installation process. (2 of 3)

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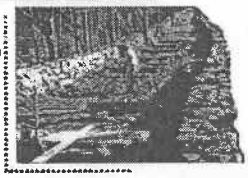
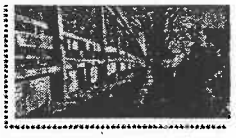
HOME

Andover Walkway



Soil Foundation Problem:
A stretch of wetlands between nature walkways not suitable to support a connecting bridge.

Solid Earth's Solution:
The landscape architect representing the office complex who wanted to build the connecting bridge selected CHANCE® HELICAL PIERS as the foundations for the elevated walkway.
Solid Earth Technologies installed 14 HELICAL PIERS and 6 Diagonal Brace Anchors through 3 to 4 feet of peat to depths between 6 and 11 feet. Our team of carpenters then constructed the 6 foot wide wooden walkway with rails on both sides.



Audubon Society's Broadmoor Sanctuary

Soil Foundation Problem:
The wildlife sanctuary wanted a new walkway system out into the swamp.

Solid Earth's Solution:
108 HELICAL PIER Foundations were installed through up to 10' of peat to support over 500' of walkways. 32 Diagonal Brace Anchors were used in areas of deeper water and mud.

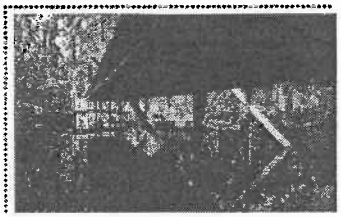


Exhibit 20: SET Brochure describing the piers and the installation process. (3 of 3)

Department of Telecommunications and Energy
Pipeline Safety Division
MEMO

Date: November 1, 2002

To: Robert Smallcomb, Director
From: Paul Grieco, Engineer
Subject: 82 Marsh View Rd, Chatham

I arrived at 82 Marsh View Road, Chatham at about 12:30 PM on October 31, 2002 with John Higgins, Manager Field Operations from Keyspan.

At this location was a 550 foot 1" plastic service, tied to the main on the long side of the street. The service was installed in a 350 foot black plastic sleeve (material unknown). The sleeve was installed by a contractor working for the general contractor by directional drilling through a marsh, to a small piece of high ground out in the march. The only access to this house is by an elevated walk way over the marsh. The service was installed without an EFV (excess flow valve) due to the distance from the main to the house. The main was not exposed. The service was shut off at the curb cock.

Linda Dole of Polhemus Savery DaSilva, Architects-Builders, (the general contractor) 101 Depot Rd Chatham 02633, phone 508-945-4500 stated that a company was hired to install a new walk way to the island. That company is;
Solid Earth Technologies Inc.
Matt Stacey, President
3 Howe Drive, unit 3
Amherst N.H. 03031
877-389-7822
www.solidearthtech.com (see attached)
Mr. Stacey admitted to John Higgins that dig safe was not notified. The person who was installing the piers stated to the general contractor that the location where the damage occurred was drilled on Monday October 28,2002, the fire occurred on Wednesday October 30, 2002.

In approximately the same location as the gas sleeve and gas service line were the other conduits, two electric, one being used and a spare, telephone and cable, the location of the water service was unknown. The electric conduits and the others did not appear to be sealed on the inside of the house. There was also a 4" sleeve that penetrated the foundation of the house, it was not being used, Linda Dole had no information about this sleeve.

The injured party was Len Savery. The Fire Chief interviewed Len Savery and told John Higgins that Savery stated that an odor was noticed by the owner. Savery opened the hatch to the crawl space, turned on the light and noticed some paper on fire. He then went to get a fire extinguisher. In the meantime the fire alarm went off and the alarm company called the house. Savery fought the fire with the extinguisher and told the alarm company to send the Fire Department. Savery suffered smoke inhalation, he was released from the hospital on October 31,2002.

An excavation had been made near the house at the end of the sleeve and the service was cut and capped prior to my arriving, there was also an excavation near the street side of the service, no cuts were observed. The gas company made another excavation near the end of the gas service line sleeve so that the service line could be pulled out. The live end was sealed. When the service was pulled out a hole and scuff marks were discovered. The company measured the line so that it could be determined where the damage was in relation to the end of the sleeve. The damage occurred approximately 83 feet from the end of the gas sleeve (house side). The crew used a tape measure to measure above ground 83 feet from the sleeve and found this to be approximately where bubbles were observed.

Exhibit 21: Memo from Paul Grieco, DTE, to Robert Smallcomb, DTE, November 1, 2002 (1 of 2)

The crew cut out the damaged section and put the pipe back together with a compression fitting. A pressure test was then applied to determine if there were any other leaks. The pressure test was at 100 PSIG for 25 minutes (removed at 2:20 PM). No other leaks were discovered. The company will in the near future test the section from the sleeve to the meter at the rear of the house.

John Higgins is in control of the section of 1" plastic service that was cut out.

Exhibit 21: Memo from Paul Grieco, DTE, to Robert Smallcomb, DTE, November 1, 2002 (2 of 2)

Exhibit 22: View of the light switch.

Exhibit 23a: View of the pier at the location where the pipe was damaged.

Exhibit 23b: Close-up view of the pier at the location where the pipe was damaged. Note the gas bubbles in the water.