## SUMMARY OF RESULTS AND FINDINGS

## LINE 132 PIPELINE SAMPLING AND ANALYSIS
**Pacific Gas and Electric Company**
**July 2012**

### Sampling and Analytical Results

The results of the sampling and analysis of samples collected at two locations of the 1948-1956 and 1956–2010 (North) segments of Line 132 pipeline are summarized in the following tables.

Table 1: Analysis of liquid sample from the 1948 segment along Glenview Drive

Table 2: Mercury analysis in scrape samples from the 1948 and 1956 segments.

Table 3: Analysis of air samples from the bell holes at the 1948 and 1956 segments

Table 4: Analysis of air samples from specified locations of the 1948 and 1956 segments as requested by City of San Bruno.

The locations of the sampling points on the 1948-1956 and 1956-2010 (North) segments are shown on the enclosed map.

### Summary of Findings

Based on the analytical results listed above and summarized in the enclosed tables, following are the summary of findings of the sampling and analysis completed to date:

1. The concentrations of metals, volatile and semi-volatile hydrocarbons detected in the liquid sample collected from the 1948–1956 pipe segments were above the laboratory detection limits but below State and Federal standards for hazardous waste.
2. The liquid sample also passed the 96-hour aquatic bioassay (toxicity) test, which confirms it is non-hazardous waste under State regulations. The survival rate of greater than 95 percent is well above the regulatory standard of 50 percent survival rate for a sample concentration of 500 mg/L for hazardous waste.
3. The concentrations of Mercury detected in the scrape samples from both the 1948-1956 and 1956–2010 (North) segments were below the state Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC) criteria as well as the federal Threshold Contaminant Leaching Procedure (TCLP) criteria for hazardous waste classification.
4. Results of air monitoring and sampling of the pipeline gas indicates the presence of hydrocarbon compounds above the permissible exposure limits for worker protection.

**TABLE 1. SUMMARY OF RESULTS**
**1948 PIPE SEGMENT LIQUID SAMPLE**

| Constituents | Method | Sample Result | Regulatory Threshold | |
|---|---|---|---|---|
| | | 1948 Pipe | STLC (a) | TTLC (a) |
| | | mg/kg | mg/L | mg/kg |
| Toluene | EPA 8260B | 45 | N/A | N/A |
| Ethylbenzene | EPA 8260B | 31 | N/A | N/A |
| m, p-Xylenes | EPA 8260B | 180 | N/A | N/A |
| Isopropylbenzene | EPA 8260B | 11 | N/A | N/A |
| Propylbenzene | EPA 8260B | 21 | N/A | N/A |
| 1, 3, 5-Trimethlybenzene | EPA 8260B | 60 | N/A | N/A |
| 1, 2, 4-Trimethlybenzene | EPA 8260B | 190 | N/A | N/A |
| sec-Butylbenzene | EPA 8260B | 18 | N/A | N/A |
| para-Isopropyl Toluene | EPA 8260B | 21 | N/A | N/A |
| n-Butylbenzene | EPA 8260B | 29 | N/A | N/A |
| Naphthalene | EPA 8260B | 180 | N/A | N/A |
| Other VOC's | EPA 8260B | ND (a) | N/A | N/A |
| Naphthalene | EPA 8270C | 330 | N/A | N/A |
| 2-Methylnaphthalene | EPA 8270C | 740 | N/A | N/A |
| Other SVOC's | EPA 8270C | ND | N/A | N/A |
| Heptachlor | EPA 8081A | ND | 0.47 | 4.7 |
| PCB's | EPA 8082 | ND | 5 | 50 |
| Arsenic | EPA 6010B | 0.83 | 5 | 500 |
| Barium | EPA 6010B | 2.9 | 100 | 10,000 |
| Chromium (VI) | EPA 6010B | 0.34 | 5 | 500 |
| Copper | EPA 6010B | 1.7 | 25 | 2500 |
| Lead | EPA 6010B | 0.48 | 10 | 1000 |
| Mercury | EPA 7471A | 0.04 | 0.2 | 20 |
| Nickel | EPA 6010B | 0.72 | 20 | 2000 |
| Other CAM 17 Metals | EPA 6010B | ND | N/A | N/A |

**Aquatic Bioassay Test**

| Sample Concentration | Method | 96-Hour Survival, Percent | |
|---|---|---|---|
| | | Sample Result | Criteria |
| Control | Rainbow Trout | 100 | NA |
| 250 mg/L | Rainbow Trout | 100 | NA |
| 500 mg/L | Rainbow Trout | 95 | 50 |
| 750 mg/L | Rainbow Trout | 95 | NA |

**NOTE:**

(a) From CCR Title 22; Chapter 11; Article III; Table 3

ND - Not Detected above method detection or reporting limit; see laboratory reports for method detection limits (MDL) and/or reporting limits (RL)

NA - Not Applicable

**TABLE 2. SUMMARY OF RESULTS OF MERCURY ANALYSIS**
**L-132 SCRAPE SAMPLES (1948 and 1956 segments)**
**June 2012**

| Client Sample ID | Lab Sample ID | Collected By | Pipe Segment (year) | Sample Date | Sample Type | EPA Method | Test Method | Unit | Sample Result | Regulatory Criteria |
|---|---|---|---|---|---|---|---|---|---|---|
| 56-22+92 | 720-43033-1 | PG&E | L-132 (1956) | 6/27/2012 | Scrape Solids | 7471A | TTLC | mg/Kg | 2.5 | 18.0 mg/kg |
| 56-22+92 | 720-43033-1 | PG&E | L-132 (1956) | 6/27/2012 | Scrape Solids | 7470A | STLC | mg/L | 0.0089 | 0.20 ppm or mg/L |
| | | | | | | | | | | |
| 56-22+92 | 720-43174-1 | PG&E | L-132 (1956) | 6/29/2012 | Scrape Solids | 7470A | STLC | mg/L | 0.0050 | 0.20 ppm or mg/L |
| | | | | | | | | | | |
| 48-22+80 | 720-43034-1 | PG&E | L-132 (1948) | 6/28/2012 | Scrape Solids | 7471A | TTLC | mg/Kg | 0.14 | 18.0 mg/kg |
| | | | | | | | | | | |

NOTE:

TTLC: Total threshold limit concentration
STLC: Soluble threshold limit concentration
mg/kg: milligram per kilogram or ppm
mg/L: milligram per liter
ppm: parts per million or mg/kg or mg/L

**TABLE 3. SUMMARY OF AIR MONITORING RESULTS**
**L132 PIPELINE AT 1121 GLENVIEW DRIVE (1948 and 1956 Segments)**
**June 2012**

| Constituents/Compounds | Method | Sampled By | Sample Date | OSHA Permissible Exposure Limits (8-hour TWA), ppb | NIOSH Recommended Exposure Limits (8-hour TWA), ppb | Monitoring Results | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1948 Pipe Segment, ppb | 1956 Pipe Segment, ppb |
| Mercury | NIOSH 6009M | Alisto | 6/26/2012 | *12* | *12* | ND (6) | ND (6) |
| | | | | | | | |
| Hydrogen Sulfide | Draeger CMS | Alisto | 6/26/2012 | *20,000* | *10,000* | ND (4) | ND (4) |
| | | | | | | | |
| Metals (1) | NIOSH 7300 | Alisto | 6/26/2012 | *Various* | *Various* | ND (3) | ND (3) |
| | | | | | | | |
| Mold (Fungal Spores and Particulates) | Optical Microscopy | Alisto | 6/26/2012 | *None* | *None* | ND (5) | ND (5) |
| | | | | | | | |
| Propylene | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 14,000 | 2,000 |
| n-Butane | EPA TO-15 | Alisto | 6/26/2012 | *None* | *800,000* | 12,000 | 2,400 |
| Ethanol | EPA TO-15 | Alisto | 6/26/2012 | *1,000,000* | *1,000,000* | 290 | 27 |
| Isopropyl alcohol (2-Propanol) | EPA TO-15 | Alisto | 6/26/2012 | *400,000* | *400,000* | 220 | 25 |
| Acetone | EPA TO-15 | Alisto | 6/26/2012 | *1,000,000* | *250,000* | 2200 | 590 |
| Tertiary butyl alcohol (TBA) | EPA TO-15 | Alisto | 6/26/2012 | *100,000* | *100,000* | 28 | 140 |
| Carbon disulfide | EPA TO-15 | Alisto | 6/26/2012 | *20,000* | *1,000* | 2,700 | 460 |
| n-Hexane | EPA TO-15 | Alisto | 6/26/2012 | *500,000* | *50,000* | 3,300 | 460 |
| Cyclohexane | EPA TO-15 | Alisto | 6/26/2012 | *300,000* | *300,000* | 6,000 | 380 |
| n-Heptane | EPA TO-15 | Alisto | 6/26/2012 | *500,000* | *85,000* | 5,100 | 230 |
| Benzene | EPA TO-15 | Alisto | 6/26/2012 | *1,000* | *100* | 870 | 350 |
| Toluene | EPA TO-15 | Alisto | 6/26/2012 | *200,000* | *100,000* | 1,800 | 990 |
| Ethylbenzene | EPA TO-15 | Alisto | 6/26/2012 | *100,000* | *100,000* | 540 | 120 |
| Xylene (P&M) | EPA TO-15 | Alisto | 6/26/2012 | *100,000* | *100,000* | 1,200 | 540 |
| Xylene (O) | EPA TO-15 | Alisto | 6/26/2012 | *100,000* | *100,000* | 620 | 170 |
| Isopropylbenzene | EPA TO-15 | Alisto | 6/26/2012 | *50,000* | *50,000* | 110 | 18 |
| 4-Ethyltoluene | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 520 | 150 |
| 1,3,5-Trimethylbenzene | EPA TO-15 | Alisto | 6/26/2012 | *None* | *25,000* | 260 | 76 |
| 1,2,4-Trimetylbenzene | EPA TO-15 | Alisto | 6/26/2012 | *None* | *25,000* | 650 | 230 |
| Naphthalene | EPA TO-15 | Alisto | 6/26/2012 | *10,000* | *10,000* | 98 | 110 |
| Isobutane (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *800,000* | 1,200 | 990 |
| 1-Propene, 2-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *250,000* | 550 | NR |

| Constituents/Compounds | Method | Sampled By | Sample Date | OSHA Permissible Exposure Limits (8-hour TWA), ppb | NIOSH Recommended Exposure Limits (8-hour TWA), ppb | Monitoring Results | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1948 Pipe Segment, ppb | 1956 Pipe Segment, ppb |
| Pentane (2) | EPA TO-15 | Alisto | 6/26/2012 | *1,000,000* | *120,000* | 700 | 840 |
| Pentane, 2-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 660 | 430 |
| Cyclopentane, methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 610 | 290 |
| Hexane, 2-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 530 | 130 |
| Hexane, 3-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 850 | 120 |
| Cyclopentane, 1,1,3-trimethyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *500,000* | *500,000* | 1,300 | NR |
| Cyclohexane, methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *500,000* | *400,000* | 7,500 | 690 |
| Cyclopentane, 1,2,4-trimethyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 860 | NR |
| Cyclopentane, ethyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 530 | NR |
| Cyclopentane, 1,2,3-trimethyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 930 | NR |
| Heptane, 2-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 3,700 | 100 |
| Decane 3,3,4 trimethyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 1,200 | NR |
| Heptane, 3-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 2,600 | NR |
| Cyclopentane, propyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 610 | 110 |
| 1,3-Dimethylcyclohexane, c&t (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | 5,200 | NR |
| Octane (2) | EPA TO-15 | Alisto | 6/26/2012 | *500,000* | *75,000* | 720 | NR |
| Nonane (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *200,000* | 670 | 120 |
| Butane, 2-methyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 740 |
| Pentane, 3-methyl (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 190 |
| Cyclohexane, 1,3-dimethyl-, cis- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 220 |
| Decane (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 150 |
| Benzene, propyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 120 |
| Undecane (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 130 |
| Benzene, 1,2,3,4-tetramethyl- (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 110 |
| Dodecane (2) | EPA TO-15 | Alisto | 6/26/2012 | *None* | *None* | NR | 120 |
| All Other TO-15 Compounds | EPA TO-15 | Alisto | 6/26/2012 | *Various* | *Various* | ND or NR | ND or NR |

Note:

(1): Metals analysis include As, Ba, Cd, Co, Cr, Cu, Mo, Ni, Pb, Sb, Se, Tl, V, Zn

(2): Tentatively Identified Compounds (TIC)

(3): Reported in ug and ug/m3 (units)

(4): Reported in PPM (unit)

(5): Reported in Count/m3 (unit)

(6): Reported in ug/tube and ug/m3 (units)

ND: Not Detected, see labratory results/report for method detection limits (MDL) and/or reporting limits (RL)

NR - Not Reported

TABLE 4. SUMMARY OF RESULTS
L132 PIPELINE CITY-REQUESTED AIR MONITORING AND SAMPLING (1948 and 1956 Segments)
JULY 2012

| Compounds | Method | Sampling Date | OSHA Permissible Exposure Limits (8-hour TWA), ppb | NIOSH Recommended Exposure Limits (8-hour TWA), ppb | Monitoring Results | | |
|---|---|---|---|---|---|---|---|
| | | | | | 1948 Downstream, ppb | 1948 Upstream, ppb | 1956 Upstream, ppb |
| Acetone | EPA TO-15 | 7/2/2012 | *1,000,000* | *250,000* | 1,100 | 110 | 340 |
| Carbon disulfide | EPA TO-15 | 7/2/2012 | *20,000* | *1,000* | 1,800 | 160 | 2,000 |
| n-Hexane | EPA TO-15 | 7/2/2012 | *500,000* | *50,000* | 510 | 47 | 690 |
| 2-Butanone | EPA TO-15 | 7/2/2012 | *200,000* | *200,000* | 280 | 33 | 26 |
| Cyclohexane | EPA TO-15 | 7/2/2012 | *300,000* | *300,000* | 410 | 37 | 540 |
| Benzene | EPA TO-15 | 7/2/2012 | *1,000* | *100* | 940 | 87 | 390 |
| n-Heptane | EPA TO-15 | 7/2/2012 | *500,000* | *85,000* | 450 | 44 | 630 |
| 4-Methyl-2-Pentanone | EPA TO-15 | 7/2/2012 | *None* | *None* | ND | 1.9 | ND |
| Toluene | EPA TO-15 | 7/2/2012 | *200,000* | *100,000* | 2,000 | 190 | 1,500 |
| 2-Hexanone | EPA TO-15 | 7/2/2012 | *100,000* | *1,000* | 19 | 3.5 | ND |
| Ethylbenzene | EPA TO-15 | 7/2/2012 | *100,000* | *100,000* | 140 | 23 | 210 |
| m, p-Xylenes | EPA TO-15 | 7/2/2012 | *100,000* | *100,000* | 560 | 90 | 670 |
| o-Xylene | EPA TO-15 | 7/2/2012 | *100,000* | *100,000* | 160 | 26 | 200 |
| 4-Ethyltoluene | EPA TO-15 | 7/2/2012 | *None* | *None* | 28 | 5.7 | 31 |
| 1,3,5-Trimethylbenzene | EPA TO-15 | 7/2/2012 | *None* | *25,000* | 35 | 6.7 | 40 |
| 1,2,4-Trimetylbenzene | EPA TO-15 | 7/2/2012 | *None* | *25,000* | 60 | 15 | 56 |
| All Other TO-15 Compounds | EPA TO-15 | 7/2/2012 | *Various* | *Various* | ND | ND | ND |
| | | | | | | | |

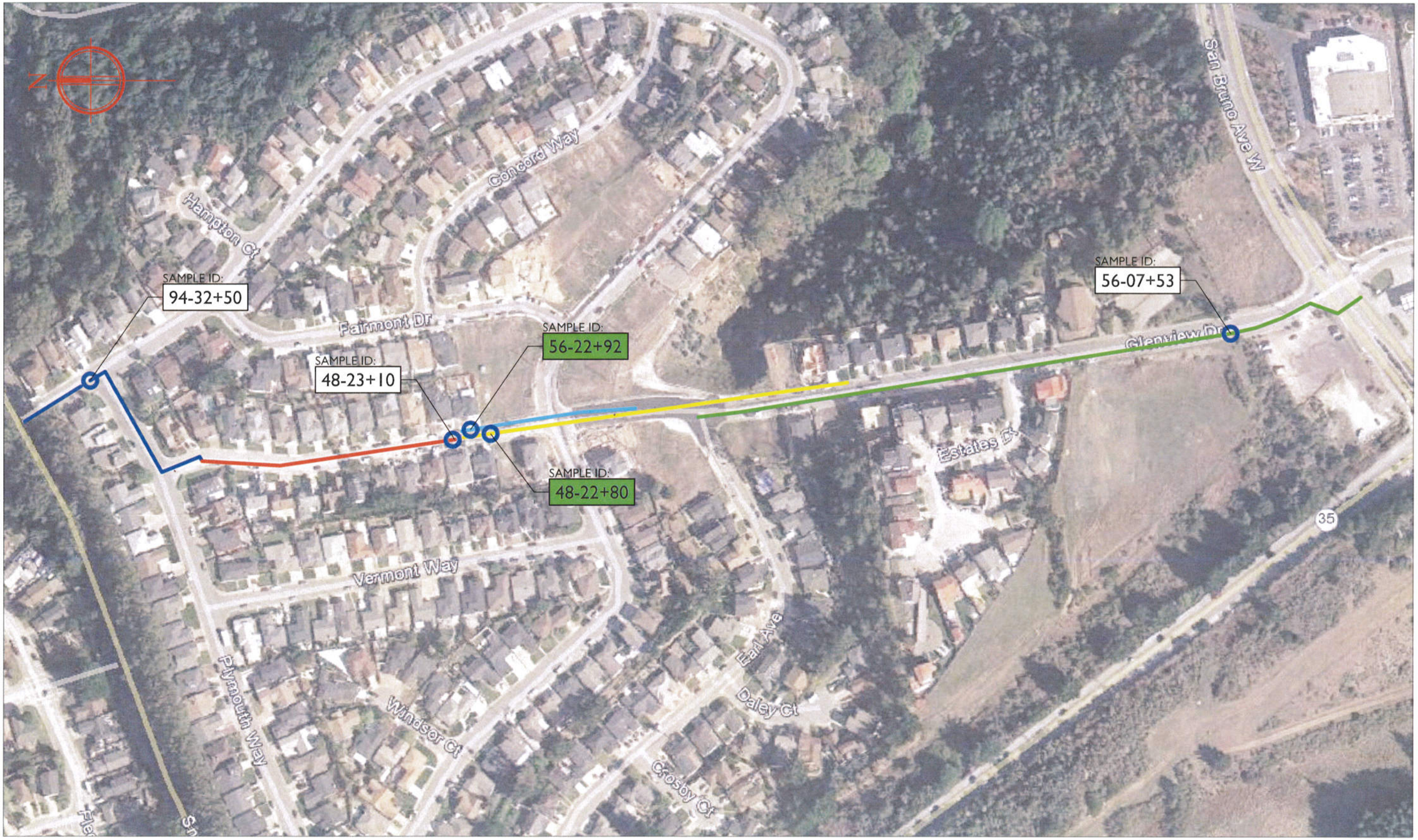
NOTE
ppb: parts per billion
ND: Not Detected, see laboratory report for method detection limits (MDL) and/or reporting limits (RL)
TWA: time weighted average

**Revised Sampling Locations as of 7/23/2012**

| Sample ID* | Container | Constituents for Laboratory Analysis | |
|---|---|---|---|
| Section 1994 - 2010 | | | |
| 94-32+50 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| 94-28+63 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| Section 1956 – 2010 (North of Earl Ave.) | | | |
| 56-22+92 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| 56-20+39 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| Section 1956 – 2010 (South of Earl Ave.) | | | |
| 56-18+33 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| 56-07+53 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| Section 1948 - 2010 | | | |
| 48-28+57 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| 48-23+10 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| Section 1948 - 1956 | | | |
| 48-22+80 | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |
| 48-16+90** | Zip Lock Bag | Metals | Chlorinated Hydrocarbons |

Color Code:

| | |
|---|---|
| | Samples already collected |
| | Additional samples to be collected next sampling event |
| | Original sampling points deleted |




1994-2010

1948-2010

1948-1956

1956-2010 (North)

1956-2010 (South)

SAMPLING POINT

48-23+10 SAMPLES TO BE COLLECTED

48-22+80 SAMPLES COLLECTED

ALISTO ENGINEERING GROUP
2737 N. MAIN STREET, SUITE 200, WALNUT CREEK, CALIFORNIA 94597
OFFICE TEL.# (925)279-5000 FAX # (925)279-5001

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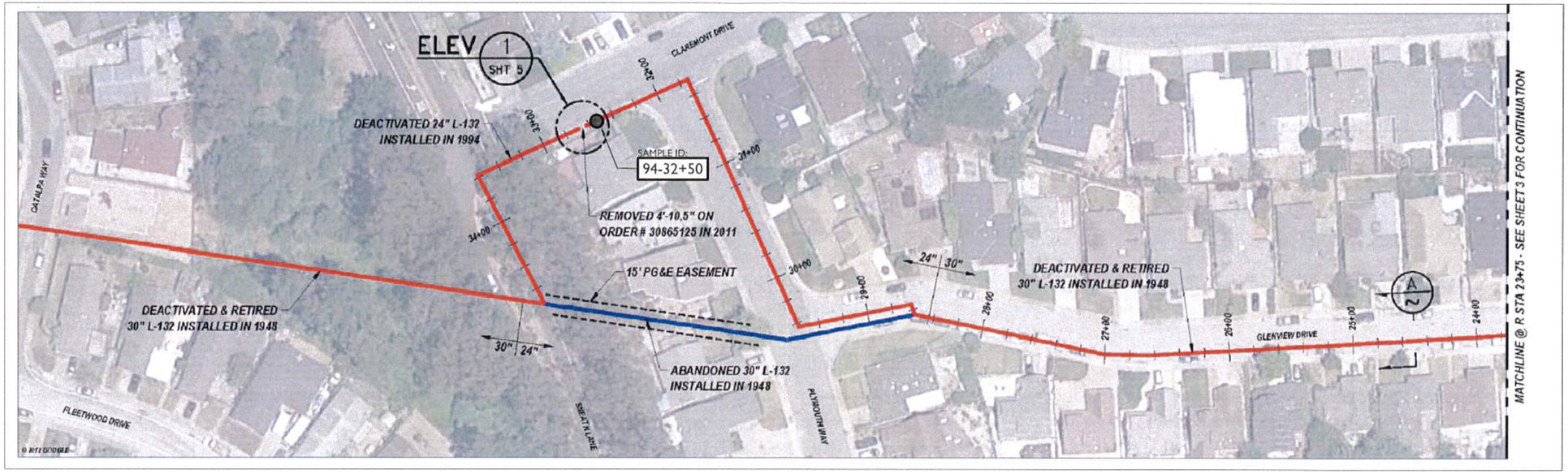


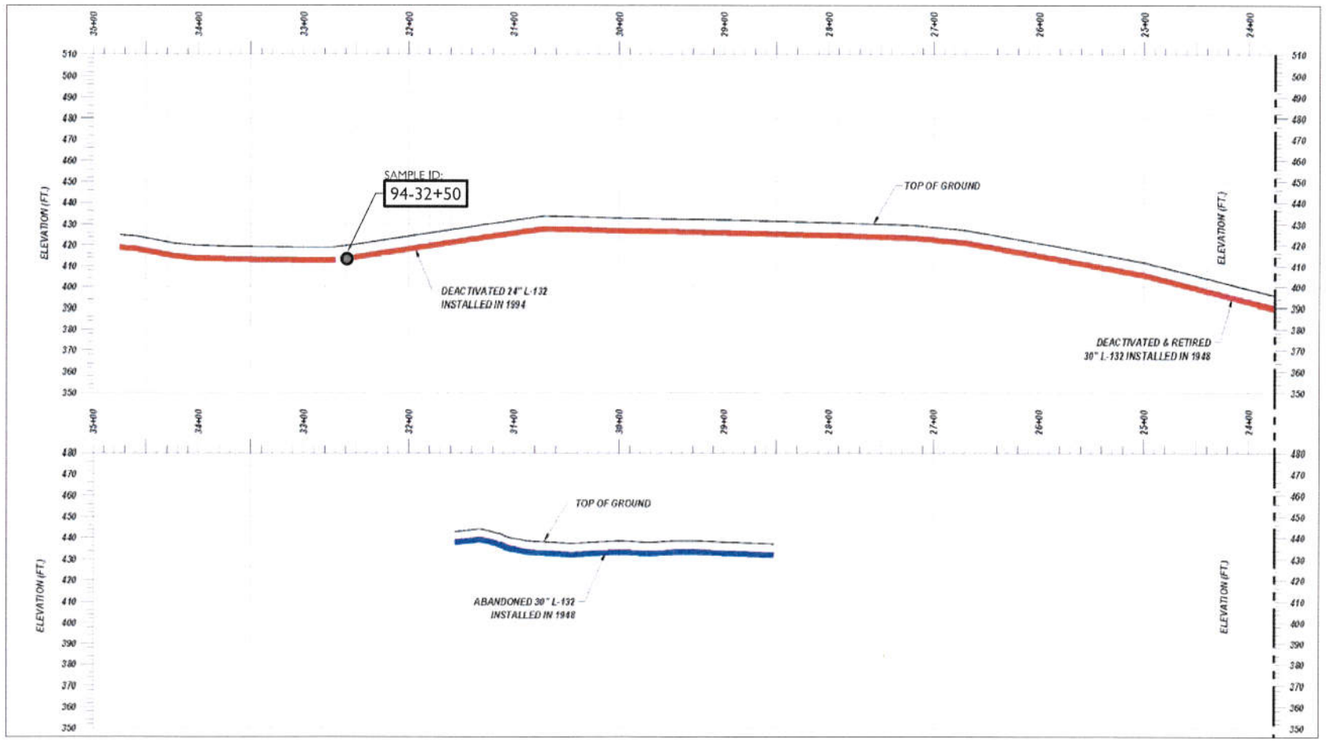


NOTE:

PLAN & PROFILE OF EACH PIPLINE SECTION PROVIDED BY PACIFIC GAS & ELECTRIC COMPANY.

| REFERENCES | NO. | DATE | DESCRIPTION | DWN | CHKD | SUPV | APVD | BY: |
|---|---|---|---|---|---|---|---|---|
| | | | REVISIONS | | | | | |

# L-132
# -SAMPLING LOCATIONS-

SNEATH LANE TO SAN BRUNO AVENUE
SAN BRUNO, CALIFORNIA

PACIFIC GAS & ELECTRIC COMPANY

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

2737 N. MAIN STREET, SUITE 200, WALNUT CREEK, CALIFORNIA 94597
OFFICE TEL.# (925)279-5000 FAX # (925)279-5001

| | |
|---|---|
| DATE: | 07.23.12 |
| DRAWN BY: | jla |
| DESIGNED BY: | |
| APPROVED BY: | |
| SHEET NO.: | 2 |
| SHEETS | |

F:\07\10-730 PG&E Pipeline Safety Enhancement Program (Joe Covey)\Phase 05 L132 Removal and Disposal Project Support\L-132 SAMPLING LOCATION MAPS\072312 FIGURE 2.dwg

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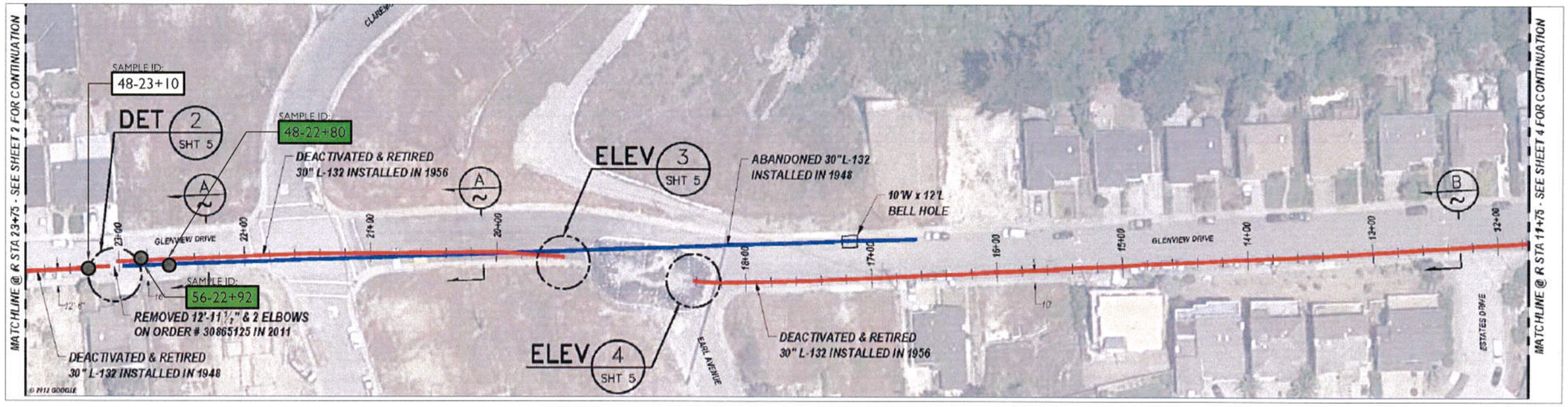


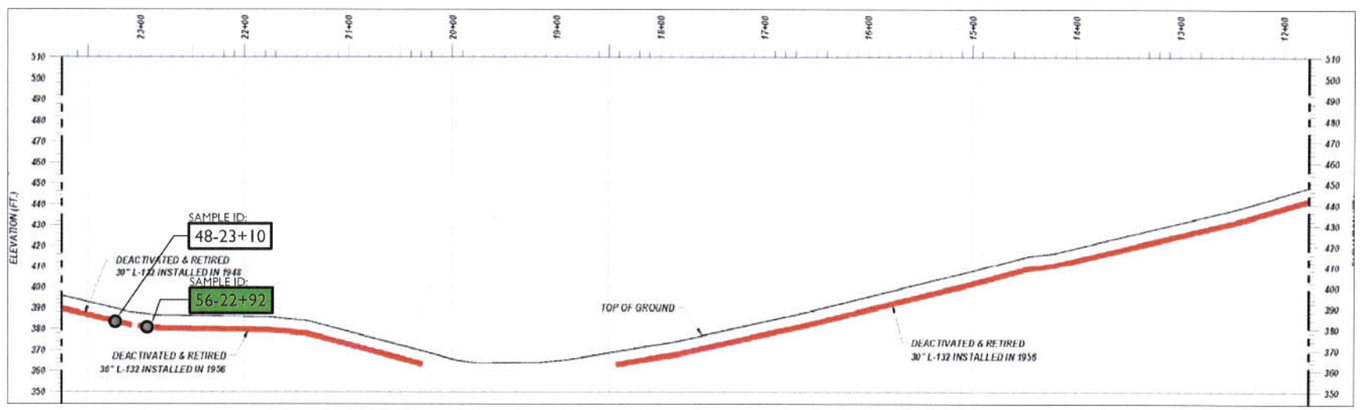


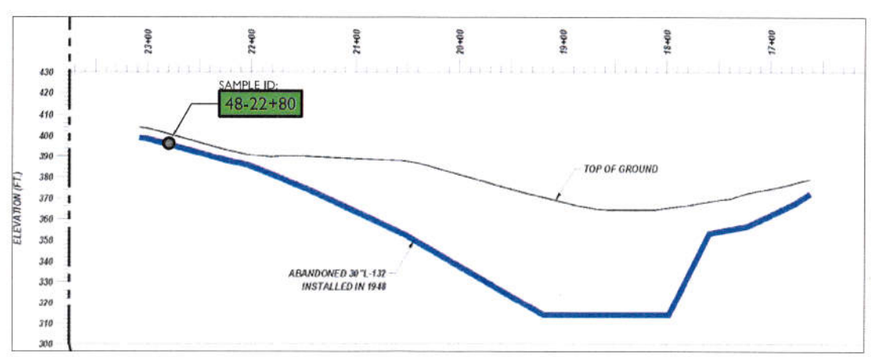


NOTE:

PLAN & PROFILE OF EACH PIPLINE SECTION PROVIDED BY PACIFIC GAS & ELECTRIC COMPANY.

| REFERENCES | |
|---|---|

| NO. | DATE | DESCRIPTION | DWN | CHKD | SUPV | APVD | BY |
|---|---|---|---|---|---|---|---|

REVISIONS

# L-132
# -SAMPLING LOCATIONS-

SNEATH LANE TO SAN BRUNO AVENUE
SAN BRUNO, CALIFORNIA

PACIFIC GAS & ELECTRIC COMPANY

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

2737 N. MAIN STREET, SUITE 200, WALNUT CREEK, CALIFORNIA 94597
OFFICE TEL.# (925)279-5000 FAX # (925)279-5001

| | |
|---|---|
| DATE: | 07.23.12 |
| DRAWN BY: | jla |
| DESIGNED BY: | |
| APPROVED BY: | |
| SHEET NO.: | 3 |
| SHEETS | |

F:\07\10-730 PG&E Pipeline Safety Enhancement Program (Joe Covey)\Phase 05 L132 Removal and Disposal Project Support\L-132 SAMPLING LOCATION MAPS\072412 FIGURE 3.dwg

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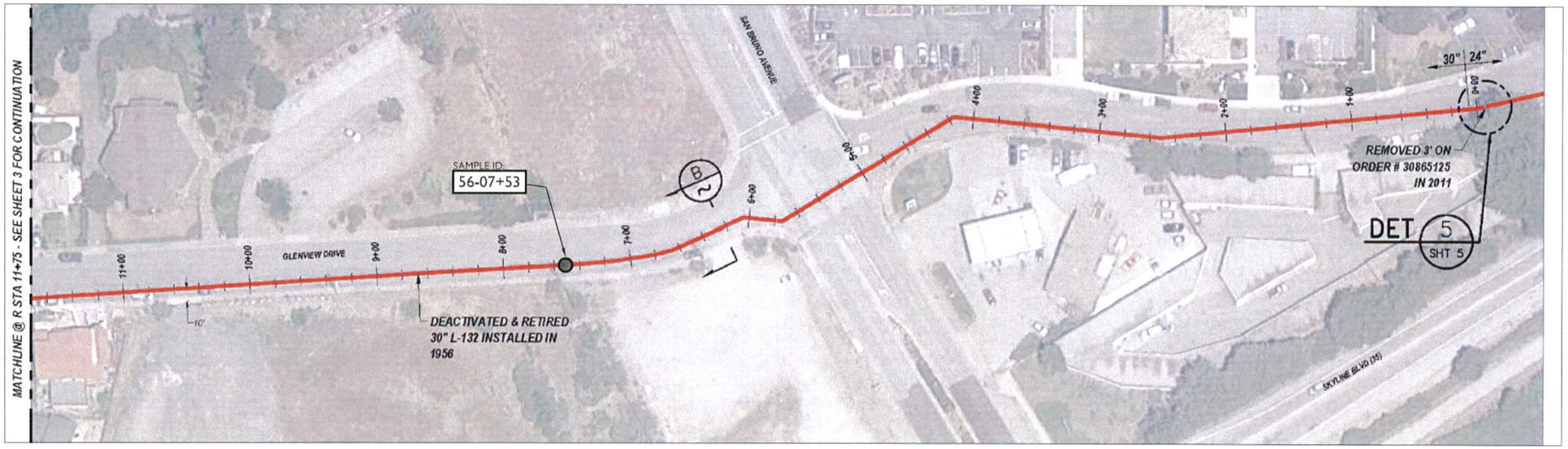


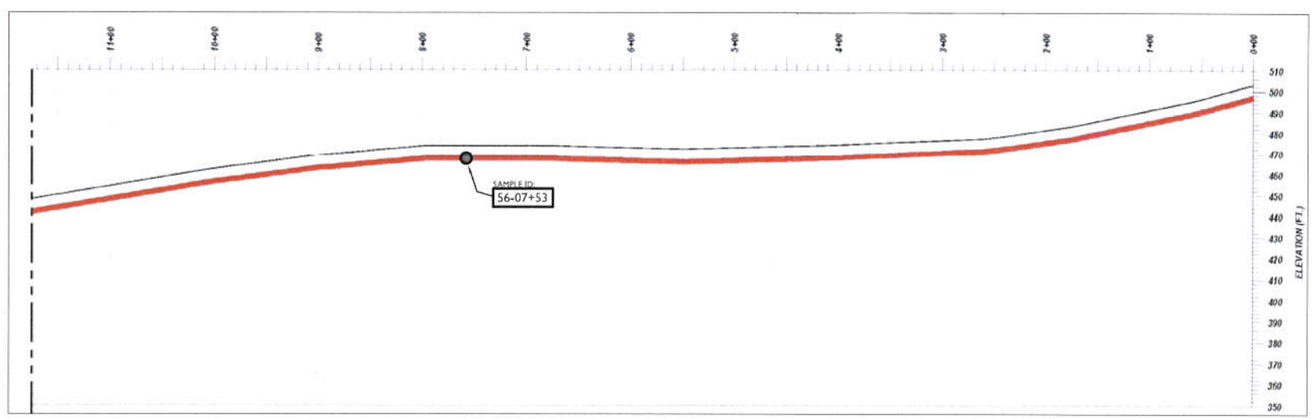


NOTE:

PLAN & PROFILE OF EACH PIPLINE SECTIONS PROVIDED BY PACIFIC GAS & ELECTRIC COMPANY.

| NO. | DATE | DESCRIPTION | DWN | CHKD | SUPV | APVD | BY: |
|---|---|---|---|---|---|---|---|

REFERENCES

REVISIONS

# L-132
# -SAMPLING LOCATIONS-

SNEATH LANE TO SAN BRUNO AVENUE
SAN BRUNO, CALIFORNIA

PACIFIC GAS & ELECTRIC COMPANY

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

2737 N. MAIN STREET, SUITE 200, WALNUT CREEK, CALIFORNIA 94597
OFFICE TEL.# (925)279-5000 FAX # (925)279-5001

DATE: 07.11.12
DRAWN BY: jla
DESIGNED BY:
APPROVED BY:
SHEET NO.: 4 SHEETS

Z:\07\10-744 Gas Transmission Environmental Consulting Services\Sampling and Analysis Plan\L-132 SAMPLING LOCATION MAPS\071112 FIGURE 4.dwg