

Exhibit No. ___ (GECB-13)
Docket No. PG-041624
Witness: Dr. Graham E.C. Bell

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

DOCKET NO. PG-041624

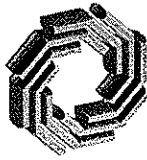
EXHIBIT OF

GRAHAM E. C. BELL, Ph.D., P.E.

**ON BEHALF OF STAFF
OF WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

**Letter from Kevin C. Garrity, PE of CC Technologies
To Steven Secrist, Puget Sound Energy, "Puget Sound Energy,
Summary of Findings – Soil Survey – Spirit Ridge Subdivision" (F44345-01G),
Dated June 15, 2005**

July 21, 2005



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CC Technologies

*SOLVING PROBLEMS THROUGH
INNOVATION*

June 15, 2005

Steven Secrist
Puget Sound Energy
10885 N.E. 4th Street
11th Floor
Bellevue, Washington 98009

*RE: Puget Sound Energy, Summary of Findings-Soil Survey –Spirit Ridge
Subdivision (F4434-01G).*

Gentlemen:

CC Technologies Services, Inc. (CC Technologies) was retained to perform an analysis of soil samples from four locations in the Spirit Ridge Subdivision associated with the failed service line at 16445 SE 26 Place in Bellevue, WA. The four samples were received on May 16th, 2005 at CC Technologies in Dublin, Ohio. The samples received are as follows:

- 16445 SE 26 Place in Bellevue, WA
 - 1 Sample From The Meter
 - 1 Sample From The Gas Main
 - 1 Remote Sample
 - 1 Sample From The Southwest Foundation

APPROACH

The soil samples were analyzed to determine water soluble cations and anions, pH, total acidity, total alkalinity, moisture content, and resistivity. Type C1018 carbon steel coupons were placed in the soils to establish corrosion rate through Linear Polarization Resistance (LPR) measurements.

SUMMARY OF SOIL ANALYSIS

Based on the soil testing results the conclusions can be summarized as follows:

- Low content of water soluble ions (chloride and sulfate, etc.).
- Moderate moisture content ranged from 9.8 to 17.1 %.
- pH values ranged from 5.8 to 6.77.
- Soil resistivity ranged from 15,000 to 27,000 Ohm-cm.
- Corrosion rate ranged from 2.8 mpy to a maximum of 6.3 mpy with an average value of 5.0 mpy.

While the individual samples demonstrated a range of results, there is nothing in the lab analysis that indicates the soil conditions in the Spirit Ridge neighborhood had unique corrosive characteristics.

The complete results are contained in Table 1.

Very truly yours,

CC Technologies Services, Inc.



Kevin C. Garrity, P.E.
Executive Vice President, Operations

Table 1. Chemical and Physical Properties of Soil

Sample ID	Soluble cations mg/kg		Soluble anions, mg/kg						pH soil	Total acidity mg CaCO ₃ /kg	Total alkalinity mg CaCO ₃ /kg	Moisture content %	LPR mpy	Resistivity Ohm-cm
	Ca ²⁺	Mg ²⁺	NO ₂ ⁻	NO ₃ ⁻	Cl ⁻	SO ₄ ²⁻	S ²⁻	CO ₃ ²⁻						
050405 meter	1.81	1.08	0.045	7.3	0.6	5.1	N/D	N/D	33.8	125.0	27.7	9.8	2.8	27,000
050405 gas main	1.88	N/D	0.014	15.2	N/D	5.6	N/D	N/D	28.1	96.6	23.1	13.3	5.6	20,000
050405 remote	3.94	7.62	0.041	5.3	N/D	123.1	0.018	N/D	44.1	110.0	36.2	17.1	6.3	15,000
050405 SW foundation	12.45	3.43	0.028	18.1	N/D	107.9	N/D	N/D	21.5	140.0	17.6	14.8	5.1	21,000