

Memo

To: Paul Agid
From: Beth Clark
CC: Elizabeth Leavitt, Jim Thomson
Date: 04/30/01
Re: Black River Quarry

Rock aggregate was imported to the Third Runway embankment from the Black River Quarry during August through October 2000. The site, owned by Stoneway Rock & Recycling, also operates as a concrete crushing and recycling center. Blasting and crushing of bedrock derived from the quarry produces aggregate that is used for various construction projects in the Puget Sound. Chemical testing was conducted on samples of the aggregate by AMEC, environmental consultant to the supplier City Transfer, Inc. (CTI). The initial test results for this site were submitted to Ecology in the Port's Third Quarterly Report 2000. On the request of the Port, AMEC conducted additional chemical testing on the aggregate. These test results have been discussed with Mr. Chung Yee of the Department of Ecology (various telecommunications fall, 2000) and are discussed further below.

Testing for Petroleum Hydrocarbons

Table 1, prepared by AMEC, summarizes the test results for petroleum hydrocarbons. The initial test results indicated the presence of diesel and heavy oil range petroleum (TPH diesel and oil) at 200 and 310 ppm respectively. This exceeds the current Method A standard of 200 ppm, but is well below the new MTCA Method A standard of 2000 ppm which becomes effective August 15, 2001. The presence of TPH was attributed to the inadvertent mixing of residual asphaltic materials found in the recycling operations with the stockpiled soil. Subsequent samples collected on 6/22/00 and 7/6/00 of newly blasted rock also detected TPH but at levels below current and proposed MTCA Method A standards. Based on the results of the initial chemical testing, the Port agreed to accept only newly blasted rock and required AMEC to conduct ongoing TPH testing as a condition to the acceptance of the material to the Third Runway embankment. The initial test results were submitted to Ecology.

The results of the ongoing sampling of the aggregate are also summarized in Table 1 (9/25/00 through 10/11/00). The results indicate the continued presence of low levels of TPH (primarily oil). The results varied from non-detect up to 270 ppm. After careful review of the site operations, AMEC concluded that the only apparent source of TPH was residual material in the crushing equipment left from the asphalt recycling operations. The Port stopped the import of material from the Black River Quarry in October and instructed CTI and Stoneway to evaluate potential modifications in procedures to better separate the asphalt recycling and rock crushing operations. Based on their evaluation, Stoneway modified operations to include:

- (1) Thorough cleaning of the crushing equipment after the asphalt recycling operations and before the switch to rock crushing, and
- (2) Discard of the first hundred tons of rock crushed after the use of the equipment for asphalt recycling.

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Subsequent on-site testing conducted by AMEC on 10/24/00 through 10/30/00, after the modifications in operations, indicate levels below current and proposed Method A standards. Although there were no exceedances of Method A standards, none of this material was placed at the Third Runway.

Testing for Metals

After review of the Port's Third Quarterly Report 2000, Mr. Chung Yee of Ecology called the Port to discuss the metal data. He particularly noted the presence of copper at levels above typical background levels for Puget Sound, but for which there is not MTCA Method A standard. The initial test results are summarized on Table 2 (6/9/00). Based on Mr. Chung Yee's evaluation, the Port requested AMEC to conduct additional sampling of the aggregate for total metals. AMEC and the Port also discussed the potential sources of copper and concluded that copper was naturally occurring in the rock formation and that there were no known on-site sources of copper contamination.

These results of the additional metals testing are also summarized on Table 2 (11/30/00). The results of the testing are compared to current and proposed MTCA Method A standards for analytes for which these standards are published, and MTCA Method B standards when there are no published Method A standards. The Method B standards were developed based on protection of groundwater using the Three Phase Partitioning Model (WAC 173-340-747). Ecology uses this conservative model to back-calculate soil concentrations that are protective of drinking water. The default assumptions used by Ecology in the regulations were used in the calculations. Metal test results in Table 2 in all cases are below the published MTCA Method A and calculated Method B standards.

Status

The Port stopped the import of material from the Black River Quarry in mid-October to allow time for the operational changes and additional testing discussed above. CTI did not bring any additional material from this site after mid-October 2000.

TABLE 1
SUMMARY OF ANALYTICAL RESULTS ON SOIL SAMPLES:
PETROLEUM HYDROCARBONS
BLACK RIVER QUARRY, KING COUNTY, WASHINGTON

Date Collected	Sample No.	TPH-G	TPH-D	TPH-O
6/9/00	S-1	<20	>50	>100
6/9/00*	S-1*	NT	■	■
6/22/00	S-2	NT	29.4	65.6
	S-3	NT	48.4	83.4
	S-4	NT	28.4	50.6
7/6/00	S-1	NT	<10.0	31.5
	S-2	NT	<10.0	35.0
9/25/00	S-3	NT	<10	<25
	S-4	NT	<10	<25
9/27/00	S-2	NT	<10	<25
	S-4	NT	<10	<25
9/29/00	S-2	NT	<25	150
	S-4	NT	<10	■
10/02/00	S-3	NT	19	130
	S-4	NT	31	■
10/9/00	S-3	NT	<10	43
	S-4	NT	<10	26
	S-7	NT	<10	<25
	S-8	NT	<10	<25
10/11/00	S-3	NT	<10	<25
	S-4	NT	<10	<25
10/24/00	S-1	NT	<10	<25
	S-2	NT	<10	<25
10/25/00	S-1	NT	<10	87
	S-2	NT	<10	33
10/27/00	S-1	NT	<10	<25
	S-2	NT	<10	33
	S-3	NT	<27	<53
	S-4	NT	<27	<53
10/30/00	S-1	NT	13	62
	S-2	NT	<10	<25
MTCA Method "A" Cleanup Level		100	200	200

MTCA = Washington State, Model Toxic Control Act
 (NT = Not Tested)
 Sample collected on 6/9/00 was tested for TPH-G, TPH-D, TPH-O = Gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons, (respectively), by Washington State Method WTPH-HCID.
 * Sample re-tested for TPH-D and TPH-O = diesel-, and heavy oil-range petroleum hydrocarbons, (respectively), by Washington State Method WTPH-D (extended).
 Samples collected after 6/9/00 were tested for TPH-D, TPH-O = Diesel-, and heavy oil-range petroleum hydrocarbons, (respectively), by Washington State Method WTPH-D (extended)
 All results in parts per million (ppm)
 Shaded Numbers = In excess of MTCA Method "A" Cleanup Levels

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**TABLE 2
SUMMARY OF ANALYTICAL RESULTS ON SOIL SAMPLES: METALS
BLACK RIVER QUARRY, KING COUNTY, WASHINGTON**

Sample	Date	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
S-1	6/9/00	ND	3.5	<0.2	0.26	22	101	111	0.1	34	ND	4.3	ND	92.5
S-1	11/30/00	ND	ND	ND	ND	20	63	ND	ND	32	ND	ND	ND	81
S-2	11/30/00	NA	NA	NA	NA	NA	88	NA	NA	NA	NA	NA	NA	NA
S-3	11/30/00	ND	ND	ND	ND	26	95	ND	ND	40	ND	ND	ND	78
S-4	11/30/00	NA	NA	NA	NA	NA	77	NA	NA	NA	NA	NA	NA	NA
S-5	11/30/00	ND	ND	ND	ND	26	91	ND	ND	36	ND	ND	ND	NA
S-6	11/30/00	NA	NA	NA	NA	NA	110	NA	NA	NA	NA	NA	NA	NA
S-7	11/30/00	ND	ND	ND	ND	31	83	ND	ND	41	ND	0.64	ND	59
S-8	11/30/00	ND	ND	ND	ND	23	86	ND	ND	43	ND	ND	ND	68
S-9	11/30/00	NA	NA	NA	NA	NA	100	NA	NA	NA	NA	NA	NA	NA
S-10	11/30/00	NA	NA	NA	NA	NA	88	NA	NA	NA	NA	NA	NA	NA
MTCA Standards														
MTCA Method A Current		N/A	20	N/A	2	100	N/A	250	1	N/A	N/A	N/A	N/A	N/A
MTCA Method A Proposed		N/A	20	N/A	2	2000 (Cr III)	N/A	250	2	N/A	N/A	N/A	N/A	N/A
MTCA Method B GW (g)		--	--	--	--	--	200	--	--	417	--	74	--	5,970

Notes:
All values reported in mg/kg

ND = Not Detected

NA = Not Analyzed

N/A=Not applicable; no published standard

(g) Method B Standards for protection of drinking water calculated using MTCA WAC 173-346-747 Three Phase Partitioning Model. Calculated for those detected constituents for which Method A standards are not available.