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**Submitting Organization**

ATLANTIC RICHFIELD CO

**Contractor**

**Document Title**

SUPPLEMENTAL INFORMATION: PRELIMINARY RESULTS OF A  
DEVELOPMENTAL TOXICITY SCREENING STUDY ON REFINERY STREAMS  
WITH COVER LETTER DATED 111391

**Chemical Category**

CARBON BLACK OIL

**SUPPL**

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William D. Laska  
Vice President  
Environment, Health & Safety

November 13, 1991

Document Control Officer (TS-790)  
Attention: 8(e) Coordinator  
Office of Toxic Substances  
U.S. Environmental Protection Agency  
401 M Street, S.W.  
Washington, DC 20460

Subject: TSCA Section 8(e) Notice on Refinery Streams  
Suspected of Containing Varying Levels of  
Carbazoles that are Contained in Carbon Black Oil  
(CAS 64741-62-4; 8EHQ-1185-0576)

Dear Sir/Madam:

In accordance with the provisions of Section 8(e) of the Toxic Substances Control Act, the Atlantic Richfield Company (ARCO) is submitting information on the preliminary results of a screening study in experimental animals to assess the developmental toxicity of refinery streams suspected of containing varying levels of carbazoles.

ARCO initiated this study due to previous reports by Mobil and ARCO (8EHQ-1185-0576) on the adverse effects on the rat fetus after dermal exposure to carbon black oil (CBO) which contain carbazoles. The objective of the ARCO study being reported in this letter was to determine the maternal and fetal toxicity of selected refinery streams that may contain carbazoles like in CBO.

For this study, refinery streams were dermally administered to groups of pregnant rats during days -7 to +4 of gestation. Animals received doses of up to 1000 mg/kg of the test materials. The data from this study has received only a preliminary review that included comparison of the present data to the range of values for the historical controls. Statistical analysis will be performed for the final report. This additional analysis may change the preliminary summary of adverse effects listed below.

The following materials were tested: clarified slurry oil (64741-62-4), gas oil intermediates (68783-08-4) heavy vacuum gas oil (64741-57-7), VDF gas oil (64741-57-7), light coker gas oil (64741-82-8), heavy coker gas oil (64741-81-7), and hydrocracker feed (64741-57-7). The data indicates that there were increases in fetal toxicity for all test materials. The primary finding was a decrease in the mean number of live pups in primarily the high dose test groups.

Atlantic Richfield Company

CONTAINS NO CBI

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November 13, 1991  
Document Control Officer  
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All the referenced materials except for gas oil intermediates and light coker gas oil have been previously reported to produce fetal toxicity (reduced fetal viability).

The current MSDS on CBO along with the above referenced refinery streams tested in these studies have been or will be updated to reflect these adverse fetal effects which highlighted the potential hazards of this material in connection with dermal exposure. This information has reinforced the necessity of proper skin protection when handling these materials.

We are attaching the preliminary information on this study which was contained in letters from the testing laboratory. EPA will be sent a copy of the final report once it is received by ARCO.

Sincerely yours,



William D. Leake

**PRELIMINARY ASSESSMENT**

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**F-179**

CLARIFIED SLURRY OIL (CSO)  
CARBON BLACK OIL (CBO)

	Dose (mg/kg)			
	<u>0.0</u>	<u>0.05</u>	<u>10.0</u>	<u>250.0</u>
Number (+) evidence of mating	18	11	12	14
Number pregnant	7	5	5	6
Number with live pups	5	5	5	0
Total number live pups				
- Day 0	76	65	54	0
- Day 4	74	53*	50	—
Mean number live pups				
- Day 0	15.2	13.0	10.8	—
- Day 4	14.8	10.6*	10.0	—
- 4 Day survival	(97%)	(82%)*	(93%)	
Mean weight (g) live pups				
- Day 0	6.45	6.57	6.56	—
- Day 4	9.41	9.12	9.36	—
- Body weight change	2.96	2.55	2.80	

\* Nine pups lost from one litter Day 0 to Day 4

Maternal Toxicity: Vaginal discharge at 250.0 mg/kg  
Reduced thymus size (14) 250.0 mg/kg

Fetal Toxicity: Reduced number of live pups 0.05 and 10.0 mg/kg

0 0 0 4

# PRELIMINARY ASSESSMENT

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## F-193

### GAS OIL INTERMEDIATES

	Dose (mg/kg)			
	0.0	1.0	250.0	1000.0
Number (+) evidence of mating	18	11	13	9
Number pregnant	18	10	12	9
Number with live litters	18	10	12	1
Total number live pups				
- Day 0	266	150	149	2
- Day 4	261	147	136	1
Mean number live pups				
- Day 0	14.8	15.0	12.4	2.0
- Day 4	14.5	14.7	11.3	1.0
- 4 Day survival	(98%)	(98%)	(91%)	(50%)
Mean weight (g) live pups				
- Day 0	6.56	6.36	6.09	4.43
- Day 4	9.67	9.59	7.41	4.61
- Body weight change	3.11	3.23	1.32	0.18

Maternal Toxicity: Vaginal discharge - 250.0 and 1000.0 mg/kg  
 Dermal irritation - slight erythema 250.0 mg/kg  
                           - slight to moderate erythema and edema  
                                           1000.0 mg/kg  
 1 found dead Day 1 lactation 1000.0 mg/kg

Fetal Toxicity: Reduced number born live at 250.0 and 1000.0 mg/kg

Pup Toxicity: Reduced weight Day 0 - 1000.0 mg/kg  
 Reduced weight Day 4 250.0 mg/kg, and weight gain at 250.0 and 1000.0 mg/kg

0 0 0 5

# PRELIMINARY ASSESSMENT

F-196

HEAVY VACUUM GAS OIL

5

	Dose (mg/kg)			
	0.0	1.0	250.0	1000.0
Number (+) evidence of mating	16	12	12	9
Number pregnant	16	10	9	8
Number with live pups	16	10	9	0
Total number live pups				
- Day 0	220	149	93	0
- Day 4	214	147	91	0
Mean number live pups				
- Day 0	13.8	14.9	10.3	0
- Day 4	13.4	14.7	10.1	0
- 4 Day survival	(97%)	(99%)	(98%)	
Mean weight (g) live pups				
- Day 0	6.34	6.26	6.20	—
- Day 4	9.46	8.92*	8.96	—
- Body weight change	3.12	2.66	2.76	

\* Two litters not weighed on Day 4

**Maternal Toxicity:** Vaginal discharge - 250.0 and 1000.0 mg/kg  
 Dermal irritation - slight erythema/cscar 1000.0 mg/kg  
 1 found dead Day 22 of gestation 1000.0 mg/kg

**Fetal Toxicity:** No live born at 1000.0 mg/kg  
 Reduced number born live at 250.0 mg/kg

**Pup Toxicity:** Slightly reduced mean weight and weight gain Day 4 - 250.0 mg/kg

# PRELIMINARY ASSESSMENT

F-197

VDF GAS OIL

9

	Dose (mg/kg)			
	0.0	1.0	250.0	1000 <sup>n</sup>
Number (+) evidence of mating	18	9	13	9
Number pregnant	18	9	13	5
Number with live pups	18	9	11	0
Total number live pups				
- Day 0	266	133	126	0
- Day 4	261	129	116	0
Mean number live pups				
- Day 0	14.8	14.8	11.5	—
- Day 4	14.5	14.3	10.5	—
- 4 Day survival	(98%)	(97%)	(91%)	
Mean weight (g) live pups				
- Day 0	6.56	6.45	6.31	—
- Day 4	9.67	9.42	8.71	—
- Body weight change	3.11	2.97	2.40	—

Maternal Toxicity: Vaginal discharge - 250.0 and 1000.0 mg/kg  
 Dermal irritation - slight erythema and edema 250.0 mg/kg  
                           - slight to moderate erythema and edema  
                           1000.0 mg/kg

Fetal Toxicity: Reduced number of pups born at 250.0 mg/kg  
 No live births at 1000.0 mg/kg

Pup Toxicity: Reduced pup survival 250.0 mg/kg  
 Reduced pup weight and weight gain at 250.0 mg/kg

0 0 8 7

## PRELIMINARY ASSESSMENT

F-199

LIGHT COKER GAS OIL

	Dose (mg/kg)			
	0.0	1.0	250.0**	1000.0*
Number (+) evidence of mating	18	13	13	
Number pregnant	18	12	13	
Number with live pups	18	12	12	
Total number live pups				
- Day 0	273	164	155	
- Day 4	267	161	148	
Mean number live pups				
- Day 0	15.2	13.7	12.9	
- Day 4	14.8	13.4	12.3	
- 4 Day survival	(97%)	(98%)	(95%)	
Mean weight (g) live pups				
- Day 0	6.57	6.46	6.59	
- Day 4	9.36	9.18	9.56	
- Body weight change	2.79	2.72	2.97	

\* Group terminated after 11 doses due to severe dermal irritation.

\*\* Dosing terminated on Day 8, 9, 10 or 11 of gestation.

Maternal Toxicity: Dermal irritation - severe 1000.0 mg/kg  
Slight to moderate at 250.0 mg/kg  
Reduced litters (8) 1000.0 mg/kg

Fetal Toxicity: Reduced number of live pups born at 250.0 mg/kg

