

US EPA ARCHIVE DOCUMENT

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION V  
POLLUTION/SITUATION REPORT #128



**KALAMAZOO RIVER/ENBRIDGE SPILL – REMOVAL**  
**SITE # Z5JS**  
**MARSHALL, MICHIGAN**  
**LATITUDE: 42.2395273; LONGITUDE: -84.9662018**



Excavation Activities and Pump System along Talmadge Creek

US EPA ARCHIVE DOCUMENT

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**From:** Ralph Dollhopf, U.S. EPA, Federal On-Scene Coordinator

**Date:** 01/10/2012

**Reporting Period:** 0700 hours 12/15/2011 through 0700 hours 01/05/2012

**Operational Periods:** 0700 hours 12/15/2011 through 0700 hours 12/22/2011; and  
0700 hours 12/22/2011 through 0700 hours 01/05/2012

### ***1. Site Data***

<b>Site Number:</b>	Z5JS	<b>Response Type:</b>	Emergency
<b>Response Authority:</b>	OPA	<b>Incident Category:</b>	Removal Action
<b>Response Lead:</b>	PRP	<b>NPL Status:</b>	Non-NPL
<b>Mobilization Date:</b>	7/26/2010	<b>Start Date:</b>	7/26/2010
<b>FPN#:</b>	E10527		

### ***2. Operations Section***

- The organizational response structure consisted of the following Branches: 1) Overbank; 2) Submerged Oil; 3) Containment; 4) OSCAR; 5) Kalamazoo River; 6) Talmadge Creek; 7) Air Operations; and 8) Waste Management.
- Limited onsite operations consisting primarily of site security and maintenance occurred from 12/22/2011 through 01/05/2012 during the winter holiday intermission.

#### **2.1 Overbank Branch**

##### ***2.1.1 Overbank Science Group***

- The Group developed plans for Outstanding Sites Characterization and Reconciliation (OSCAR) sites, including OB 13.40 LDB and OB 8.97 I.

##### ***2.1.2 Overbank Compliance Group***

- The Group continued preparation of the permit for response actions at OB 13.40 LDB.

##### ***2.1.3 Overbank Recovery Group***

- Teams conducted pre-planning for recovery operations at OB 13.40 LDB.

- Teams continued site preparation for MP 2.00, including tree removal, erosion control, site grading, and filter box construction.
- Teams executed work at OB 5.92 RDB, including bank-area sheet pile removal and equipment demobilization, pond-area sheet pile installation, and expanded pond-area dewatering system construction.

#### ***2.1.4 Overbank Monitoring Group***

- Teams continued to conduct air sampling at OB 5.92 RDB.
- Teams conducted water quality monitoring at OB 5.92 RDB during sheet pile installation.
- Enbridge continued to maintain an odor response team; however, no odor complaints were received during this reporting period.
- Air sampling and monitoring information is provided in Tables 1 and 2.

### **2.2 Submerged Oil Branch**

#### ***2.2.1 Submerged Oil Science Group***

- The Group continued to support the OSCAR Branch during review of Late Summer 2011 Reassessment (LSR) sites.
- Teams continued review of hydrodynamic assessment data and generation of the hydrodynamic model to characterize the movement of submerged oil.
- The Group continued preparation of the Fall 2011 Submerged Oil Quantification report.

#### ***2.2.2 Submerged Oil Compliance Group***

- The Group conducted management of large woody debris resulting from weather events, in accordance with applicable permit requirements.

#### ***2.2.3 Submerged Oil Recovery Group***

- No activities were conducted during the reporting period.

#### ***2.2.4 Submerged Oil Monitoring Group***

- No activities were conducted during the reporting period.

### **2.3 Containment Branch**

#### ***2.3.1 Containment Science Group***

- The Group continued refining the hydrodynamic model concepts and developing the Plan for Preventing Migration of Oil Past the Morrow Lake Dam during Winter/Spring 2011-2012.
- Development of subsurface containment strategies for depositional areas along the Kalamazoo continued.

### ***2.3.2 Containment Compliance Group***

- The Group commenced development of necessary permits for the above plans.

### ***2.3.3 Containment Recovery Group***

- Teams continued to maintain 13 protective containment sites and 2 control points and conduct debris removal from boomed areas.
- Deployed control point and protective containment hard boom information is presented in Table 3.

### ***2.3.4 Containment Monitoring Group***

- Water level gauges were monitored at multiple locations along the Kalamazoo River, the Morrow Lake Delta, and Morrow Lake.

## **2.4 OSCAR Branch**

- The OSCAR Branch continued to consolidate and prioritize outstanding work sites. The Branch participated in data review, quality control, and site closure processes to ensure that all pending issues are addressed. During the reporting period, the OSCAR Branch reviewed data from several recently completed expedited RI sites along the Kalamazoo River to determine whether they are consistent with the U.S. EPA Order or whether further site plan development is necessary.
- The OSCAR Branch requested information for site determination, and oversaw the transfer of sites between the various Branches.
- OSCAR sites status information is presented in Table 4.

## **2.5 Kalamazoo River Branch**

### ***2.5.1 Kalamazoo River Remedial Investigation Group***

- Teams continued implementation and evaluation of the Kalamazoo River RI from MP 2.25 to MP 5.80.
- The Group began development of the RI Work Plan for the next segment of the Kalamazoo River.

### ***2.5.2 Kalamazoo River Compliance Group***

- The Group continued restoration and stabilization at various Kalamazoo River Bank Erosion Assessment Sites.

### ***2.5.3 Kalamazoo River Remedial Action Group***

- Teams collected post-excavation verification samples at OB 5.92 RDB.

### ***2.5.4 Kalamazoo River Monitoring Group***

- Teams performed monthly potable water sampling.
- Refer to Table 2 for the total number of samples collected during this reporting period, as reported by Enbridge.

## 2.6 Talmadge Creek Branch

### 2.6.1 Talmadge Creek Remedial Investigation Group

- The Group continued conducting the bulk sediment toxicity study.
- The Group collected supplemental soil and water samples at specific locations between Division Street and I-69.

### 2.6.2 Talmadge Creek Compliance Group

- The Group continued evaluation of RI data and Verification of Soil Remediation (VSR) data for MP 0.0 to MP 1.0.

### 2.6.3 Talmadge Creek Remedial Action Group

- Teams continued to operate and maintain the pump-around and GAC dewatering systems, and maintain soil erosion controls. Prior to the holiday intermission, sheet piling and dewatering systems were removed from Talmadge Creek; thereby returning the creek to natural flow conditions.
- Excavation, restoration, and post – excavation verification sampling continued from MP 0.5 through MP 1.0.
- Teams maintained soil erosion and sediment controls within Talmadge Creek.

### 2.6.4 Talmadge Creek Monitoring Group

- Teams continued monitoring erosion control devices.
- Teams conducted water quality monitoring for excavation activities along Talmadge Creek.

## 2.7 Air Operations Branch

- Two overflights were conducted for situational awareness during this reporting period.
- Photographs were taken during the overflights for presentation during various meetings.

## 2.8 Waste Management Branch

### 2.8.1 Decontamination Group

- A summary of equipment and boom decontaminated during the operational period is presented in Table 5.

### 2.8.2 Transportation and Disposal Group

- Teams continued to haul contaminated soil, water, and debris to staging areas for waste characterization and oil recovery sampling prior to off-site disposal.
- Quantities of oil and debris shipped off-site during the reporting period are presented in Tables 6 through 9. All soil staged on-site was removed prior to the holiday shutdown.
- The total amount of recovered oil since the inception of the response has been estimated using actual waste stream volumes, analytical data, and physical parameters of oil-containing media. A summary of the estimated volume of recovered oil is presented in Table 10.

### **2.8.3 Waste Management Characterization Group**

- Waste management characterization, manifesting, and coordination of transportation and disposal continued according to approved plans.

## **3. Planning**

### **3.1 Situation Unit**

- Situation Unit personnel observed and documented progress in operational areas, and continued to assess areas of interest including locations of oil sheen, turbidity, and ice formation.
- Daily situational photo logs were prepared and distributed to project participants.

#### **3.1.1 GIS Specialists**

- GIS personnel continued to support operations with the generation of site maps.

### **3.2 Environmental Unit**

- EPA continued coordination with United States Geological Survey (USGS) regarding the Kalamazoo River geomorphology evaluation and the impact on strategy and tactics for future oil recovery efforts.

### **3.3 Documentation Unit**

- Documentation Unit personnel continued organizing and archiving electronic and paper files.

### **3.4 Resource Unit**

- Personnel continued to produce Incident Action Plans (IAPs), support the planning efforts of operations, and provide information to logistics in order to properly prepare and procure resources.

## **4. Command**

### **4.1 Safety Officers**

- Safety personnel continued to conduct work-site safety inspections, with a focus on seasonal weather changes and excavation activities at OB 5.92 and Talmadge Creek.
- Two abandoned drums were identified during RI work near MP 4.85 LDB on December 15, 2011.
- Minor safety incidents including 3 motor vehicle incidents and a breaking and entering incident at Frac Tank City occurred during the reporting period; however, no injuries were sustained.

### **4.2 Public Information**

- No activities were conducted during this reporting period.
- The number of public inquires reported by Enbridge for this period is presented in Table 11.

## ***5. Landowner Environmental Issues***

- Landowner environmental issues, as reported by Enbridge, are presented in Table 12.

## ***6. Finance***

- The current National Pollution Funds Center (NPFC) ceiling is \$43.7 Million. Approximately 87.4% of the ceiling has been spent through January 4, 2011. The latest average 7-day burn rate was \$11,823 per day, reflecting decreased site activities during the December holiday intermission. These cost summaries reflect only EPA-funded expenditures for the incident. A summary of these expenses is presented in Table 13.

## ***7. Participating Entities***

- The Multi-Agency Coordination (MAC) Group continues meeting twice per month to discuss the progress of the response. Entities participating in the MAC include:
  - U.S. Environmental Protection Agency
  - Michigan Department of Environmental Quality
  - City of Battle Creek
  - City of Marshall
  - Calhoun County Public Health Department
  - Calhoun County Emergency Management
  - Kalamazoo County Health and Community Services Department
  - Kalamazoo County Sheriff
  - Enbridge (Responsible Party).
- For a list of cooperating and assisting agencies and the congressional presence, see SITREP #51 (Sections 3.2 and 3.3).

## ***8. Personnel On-Site***

- Staffing numbers for the entities and agencies active in the response are presented in Table 14.

## ***9. Source of Additional Information***

- For additional information, refer to <http://www.epa.gov/enbridgespill>. For sampling analysis data, see <http://response.enbridge.com/response/>.

## 10. Clean-up Progress Metrics

**Table 1 – Real Time Air Monitoring Counts Performed by Enbridge**

Monitoring Location	Total	December 2011/January 2012							
		12/22 – 1/4	21	20	19	18	17	16	15
Odor Response	0	0	0	0	0	0	0	0	0
Work Area	0	0	0	0	0	0	0	0	0

**Table 2 – Samples Collected By Enbridge**

Sample Type	Total	December 2011/January 2012							
		12/22 – 1/4	21	20	19	18	17	16	15
Surface Water	14	0	2	1	0	0	0	0	11
Private Well	11	0	1	6	4	0	0	0	0
Groundwater	16	0	1	4	2	0	0	8	1
Sediment	1	0	0	0	1	0	0	0	0
Soil	92	0	1	21	15	0	1	21	33
Air (Odor Complaint)	0	0	0	0	0	0	0	0	0
Air (Work Area)	21	0	3	3	3	3	3	3	3

**Table 3 – Deployed Containment Hard Boom Information**

	12/15/2011 – 1/4/2012
Total Surface Hard Boom (ft)	2,800
Control Point Surface Hard Boom (ft)	400

**Table 4 – OSCAR Site Status (as of 1/5/2012)**

Overbank Branch	3
Submerged Oil Branch	198
Containment Branch	5
Talmadge Creek Branch	1
Kalamazoo River Branch	7
Consistent with EPA Order and up for MDEQ Part 201 Program	2
<b>Total Sites</b>	<b>216</b>

**Table 5 - Equipment Decontamination**

Location/Media	Total	December 2011/January 2012							
		12/22 – 1/4	21	20	19	18	17	16	15
Frac Tanks	2	0	1	1	0	0	0	0	0
Vac Trucks-Tankers	3	0	1	0	0	0	1	1	0
Roll-Off Boxes	30	0	2	8	12	0	0	3	5
Yellow Iron (light)	0	0	0	0	0	0	0	0	0
Yellow Iron (heavy)	5	0	0	1	2	0	1	0	1
Jon Boats	4	0	3	1	0	0	0	0	0
Air Boats	0	0	0	0	0	0	0	0	0
Vehicles	3	0	2	0	1	0	0	0	0
Boom (linear ft)	1200	0	600	600	0	0	0	0	0
Miscellaneous Items	161	0	1	4	4	0	2	8	142

**Table 6 - Soil and Debris Shipped Off Site (as of 1/5/2012)**

Waste Stream	Cumulative	Disposal Facility
Haz Soil (yd <sup>3</sup> )	19,644	Envirosafe (Oregon, OH)
Non-Haz Soil & Debris (yd <sup>3</sup> ) (Excluding Ceresco Dredge)	59,363	Terra/C&C
Non-Haz Soil & Debris (yd <sup>3</sup> ) (Excluding Ceresco Dredge)	64,815	Westside Recycling (Three Rivers, MI)
Non-Haz Soil (yd <sup>3</sup> ) (Ceresco Dredge Only)	5,562	EQ/Republic (Marshall, MI)
Haz Debris (yd <sup>3</sup> )	12,075	EQ/Michigan Disposal (Wayne, MI) and Republic (Marshall, MI)
Non-Haz Household Debris (ton)	1,131	EQ/Republic (Marshall, MI); C&C
Non-Haz Impacted Debris (ton)	6,458	

Shaded items are discontinued waste streams.

**Table 7 – Oil/Water Collected by Location (as of 1/5/2012)**

Location	Cumulative (gallons)
Division A	5,356,315
Division B	4,878,279
Division C	2,079,238
Division D	121,106
Division E	52,631
Decontamination	2,309,489
Site A	316,784
Other Locations*	1,687,809
Subtotal	<b>16,780,651</b>
Sludge**	<b>474,215</b>
<b>Total Oil/Water</b>	<b>16,327,436</b>

\* Wildlife Center Operations, Sediment Trap Cleaning, Hydro-Vacuuming.

\*\* Sludge collected is tracked as a liquid waste inbound; however, after stabilization, the sludge is disposed of as solid waste. Therefore, the volume of sludge is not included within the cumulative oil/water totals. Stabilized sludge is included in the solid waste disposal metrics.

**Table 8 - Liquid Shipped Off-Site (as of 1/5/2012)**

Stream	Destination Company	Destination Location	Cumulative Volume (gallons) †
Non-Haz Water	Battle Creek POTW	Battle Creek, MI	986,480
Non-Haz Water	Dynecol	Detroit, MI	981,792
Non-Haz Water	Liquid Industrial Waste	Holland, MI	884,007
Non-Haz Water	Plummer	Kentwood, MI	242,200
<i>Hazardous Water</i>	<i>Dynecol</i>	<i>Detroit, MI</i>	<i>3,594,579</i>
<i>Oil</i>	<i>Enbridge Facility</i>	<i>Griffith, IN</i>	<i>766,288</i>
<i>Other Material</i>			<i>1,405,525</i>
<i>Treated Non-Haz Water</i>	<i>Liquid Industrial Waste</i>	<i>Holland, MI</i>	<i>370,200</i>
<i>Treated Non-Haz Water</i>	<i>Plummer</i>	<i>Kentwood, MI</i>	<i>4,976,140</i>
<i>Hazardous Water</i>	<i>Safety Kleen<sup>a</sup></i>		<i>825</i>
<i>Treated Non-Haz Water*</i>	<i>Dynecol</i>	<i>Detroit, MI</i>	<i>150,700</i>
<i>Treated Non-Haz Water*</i>	<i>Battle Creek POTW</i>	<i>Battle Creek, MI</i>	<i>1,968,700</i>
<b>Total</b>			<b>16,327,436</b>

Shaded and italicized items are discontinued waste streams.

† Cumulative quantities may not reconcile with previous reports (due to auditing).

a New Age lab water and methanol mix generated by mobile laboratory.

\* Treated Non-Haz Water no longer sent to this location.

**Table 9 - Oil/Water Remaining On-Site (as of 1/5/2012)**

Item	Cumulative (gallons)
Oil/Water Collected	16,327,436
Oil/Water Shipped Off-Site	16,327,436
<b>Total Oil/Water Remaining On-Site</b>	<b>0</b>

**Table 10 – Estimated Recovered Oil (as of 12/12/2011)**

Waste Stream Containing Recovered Oil	Destination Company	Destination Location	Estimated Oil Volume in Waste Stream (gallons)
<b>Soil - (Impacted Soil &amp; Debris)</b>	C&C Landfill	Marshall, MI	12,235*
<b>Soil - (Impacted Soil &amp; Debris)</b>	Envirosafe/ Westside RDF	Oregon, OH	278,665
<b>Geotube Sediment - (Impacted Sediment)</b>	Envirosafe/ Westside RDF	Oregon, OH	1,298
<b>Debris - (Roll Off Boxes with Impacted Sorbents, boom, pads, plastic, PPE, vegetation, and biomass)</b>	EQ Michigan	Belleville, MI	33,668
<b>Frac Tank City - Influent to Carbon Filtration System</b>	C&C Landfill	Marshall, MI	8,109
<b>Frac Tank City - Water</b>	Dynecol	Detroit, MI	45,800*
	Liquid Industrial Waste Services, Inc.	Kentwood, MI	
	Plumbers Env Inc.	Holland, MI	
	BC POTW	Battle Creek, MI	
<b>Ceresco Pretreatment System</b>	C&C Landfill	Marshall, MI	90
<b>A-1 Pretreatment System</b>	C&C Landfill	Marshall, MI	9
<b>Oily Water - RPP</b>	Enbridge Facility	Griffith, IN	766,288
<b>Total</b>	-	-	<b>1,146,161</b>

Shaded items represent discontinued waste streams

\* Not all analytical data was available at the time of report generation

**Table 11 – Public Inquiries Received by EPA and Enbridge**

Location/Media	Total	December 2011/January 2012											
		4	3	12/24 – 1/2	23	22	21	20	19	18	17	16	15
Marshall Community Center	<b>17</b>	0	1	0	0	3	5	3	3	0	0	0	2
Oil Spill Public Information Hotline	<b>6</b>	1	1	0	2	0	0	0	0	0	1	0	1
Website	<b>2</b>	0	0	0	0	0	2	0	0	0	0	0	0
<b>Total Public Inquiries</b>	<b>25</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>

**Table 12 – Landowner Environmental Issues (as of 1/5/2012)**

Issues this Period	Issues Undergoing Evaluation	Issues Considered Addressed
0	5	0

**Table 13 - Financial Summary**

Item	Expended (Cumulative) (as of 1/2/2012)
<b>ERRS Contractors</b>	
EQM (EPS50802) T057	\$ 1,199,522
T060	\$ 213,636
LATA (EPS50804) T019	\$ 1,161,082
ER LLC (EPS50905) T040	\$ <u>683,330</u>
<b>Total ERRS Contractors</b>	<b>\$ 3,257,571</b>
<b>Other Contractors</b>	
Lockheed Martin (EPW09031) – TAGA Support	\$ 185,951
T&T Bisso (EPA:HS800008)	\$ <u>882,087</u>
<b>Total Other Contractors</b>	<b>\$ 1,068,038</b>
<b>START Contractor – WESTON (EPS50604)</b>	
T030-Response	\$ 20,994,706
T032-Sampling	\$ 183,567
T037-Doc Support	\$ <u>1,201,631</u>
<b>Total START Contractor</b>	<b>\$ 22,379,904</b>
<b>Response Contractor Sub-Totals</b>	<b>\$ 26,705,513</b>
<b>EPA Funded Costs: Total EPA Costs</b>	<b>\$ 5,575,831</b>
<b>Pollution Removal Funding Agreements – Total Other Agencies</b>	<b>\$ 1,508,854</b>
<b>Sub-Totals</b>	<b>\$ 33,790,198</b>
Indirect Cost	\$ 4,422,619
<b>Total Est. Oil Spill Cost</b>	<b>\$ 38,212,816</b>
<b>Oil Spill Ceiling Authorized by USCG</b>	\$ 43,700,000
<b>Oil Spill Ceiling Available Balance</b>	<b>\$ 5,487,184</b>

Shaded items are discontinued

**Table 14 - Personnel On-Site**

Agency/Entity	December 2011/January 2012										
	4	3	2	1	31	30	29	28	27	26	25
U.S. EPA	0	0	0	0	0	0	0	0	0	0	0
START	0	0	0	0	0	0	0	0	0	0	0
MDEQ	8	6	0	0	0	0	7	6	2	0	0
MDEQ Contractors	1	0	0	0	1	0	1	0	1	1	0
Calhoun County Public Health	0	0	0	0	0	0	0	0	0	0	0
Calhoun County (CC) EM	0	0	0	0	0	0	0	0	0	0	0
City of Battle Creek	0	0	0	0	0	0	0	0	0	0	0
City of Marshall	0	0	0	0	0	0	0	0	0	0	0
Village of Augusta	0	0	0	0	0	0	0	0	0	0	0
Kalamazoo County Public Health	0	0	0	0	0	0	0	0	0	0	0
Kalamazoo Sheriff	0	0	0	0	0	0	0	0	0	0	0
MDCH	0	0	0	0	0	0	0	0	0	0	0
USGS	0	0	0	0	0	0	0	0	0	0	0
Michigan State Police EMD	0	0	0	0	0	0	0	0	0	0	0
Enbridge – Operations Center	24	12	1	0	2	10	13	14	9	1	0
Enbridge – Talmadge Creek	3	1	1	0	0	1	1	1	1	1	0
Enbridge – Kalamazoo River	1	0	0	0	0	0	0	0	0	0	0
Enbridge – Containment	0	0	0	0	0	0	0	0	0	0	0
Enbridge – Submerged Oil	0	0	0	0	0	0	0	0	0	0	0
Enbridge – Overbank	3	0	0	0	0	0	0	0	0	0	0
Enbridge – Waste Management	3	0	0	0	0	0	0	0	0	0	0
Enbridge – Security & Flaggers	4	5	8	3	4	7	3	3	3	3	3
Enbridge – Communications Center	2	2	0	0	0	1	0	0	0	0	0
<b>Total</b>	<b>49</b>	<b>26</b>	<b>10</b>	<b>3</b>	<b>7</b>	<b>19</b>	<b>25</b>	<b>24</b>	<b>16</b>	<b>6</b>	<b>3</b>

\*Enbridge Operations and Field include Enbridge and contractors as reported by Enbridge

Table 14 Cont. - Personnel On-Site

Agency/Entity	December 2011/January 2012									
	24	23	22	21	20	19	18	17	16	15
U.S. EPA	0	0	0	3	3	4	0	2	4	5
START	0	0	0	18	19	19	3	15	17	17
MDEQ	0	0	7	9	9	9	0	1	10	10
MDEQ Contractors	0	0	2	8	8	8	0	1	11	11
Calhoun County Public Health	0	0	0	0	0	0	0	0	0	2
Calhoun County (CC) EM	0	0	0	0	0	0	0	0	0	1
City of Battle Creek	0	0	0	0	0	0	0	0	0	1
City of Marshall	0	0	0	0	0	0	0	0	0	0
Village of Augusta	0	0	0	0	0	0	0	0	0	0
Kalamazoo County Public Health	0	0	0	0	0	0	0	0	0	1
Kalamazoo Sheriff	0	0	0	0	0	0	0	0	0	0
MDCH	0	0	0	0	0	0	0	0	0	1
USGS	0	0	0	0	0	0	0	0	1	0
Michigan State Police EMD	0	0	0	0	0	0	0	0	0	0
Enbridge – Operations Center	0	5	28	74	80	79	5	29	82	88
Enbridge – Talmadge Creek	1	0	1	36	30	50	4	44	44	58
Enbridge – Kalamazoo River	0	0	0	29	20	19	0	0	21	19
Enbridge – Containment	0	0	0	14	14	13	0	15	15	17
Enbridge – Submerged Oil	0	0	0	1	1	4	0	1	1	1
Enbridge – Overbank	0	0	0	45	47	44	9	33	45	50
Enbridge – Waste Management	0	1	0	51	48	45	1	35	49	50
Enbridge – Security & Flaggers	3	3	6	6	6	6	6	6	6	7
Enbridge – Communications Center	0	2	2	2	2	2	0	0	4	4
<b>Total</b>	<b>4</b>	<b>11</b>	<b>46</b>	<b>296</b>	<b>287</b>	<b>302</b>	<b>28</b>	<b>182</b>	<b>310</b>	<b>343</b>