

June 23, 2020

Steve Moskal  
BP America Production Company  
1199 Main Ave Suite 101  
Durango, CO 81301

**RE: Tiffany Gathering  
June 2020 Vegetation Monitoring**

Dear Mr. Moskal,

Cottonwood Consulting LLC (Cottonwood) is pleased to provide you with the results of the vegetation monitoring conducted on June 16, 2020 at the Tiffany Gathering site. Details regarding the monitoring and results are summarized below.

### **Background**

A release occurred from a BP America Production Company (BP) pipeline known as the Tiffany Gathering in April 2020. Produced water was released and flowed across a hay field to an irrigation-influenced wetland, where the flow terminated. Soil sampling conducted on April 8, 2020 indicated that conductivity and SAR (sodium adsorption ratio) exceeded the Colorado Oil & Gas Conservation Commission Table 910-1 (COGCC) standard in some of the samples, but no hydrocarbons were detected above the COGCC Table 910-1 standard. BP received approval to perform monthly vegetation monitoring through the 2020 growing season to assess vegetative conditions within the flow path. Cottonwood conducted the first monthly monitoring event in May 2020 and reclamation activities, including the application of seed and mulch, occurred in the vicinity of the hay field shortly thereafter. Cottonwood conducted a second monitoring event in June 2020 following reclamation.

Based on a review of the National Resources Soil Conservation Service Web Soil Survey, the primary soil type within the project area is the Bayfield silty clay loam, 1-3 percent slopes. The Bayfield silty clay loam is considered prime farmland if irrigated and drained.

### **Methodology**

On June 16, 2020, a Cottonwood staff biologist conducted vegetation transect monitoring at the Tiffany Gathering release site. Cottonwood utilized the BLM's Line-point Intercept method to quantify soil cover, including vegetation, litter, rock and biotic crusts. Specific methodology can be referenced from *Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems* (Herrick et al., 2005). Two transects were located within the release area. Transect 1 was 100 feet long and located within the wet area in the hay field. Transect 2 was located within the irrigation-influenced wetland area and was divided into two segments in order to more accurately follow the flow path. The first segment was 56 ft long and the second segment was 44 ft long.

Vegetation was recorded by species to the extent practicable and the data were analyzed to determine percent (%) vegetation cover, % bare ground, and species composition. Photographs were also taken from either end of the transect line.

Transect locations and vegetation cover are provided in Table 1, a map of the project site with the transect locations can be found in Figure 1, photographs of the transects are provided in Attachment 1, and vegetation transect data can be found in Attachment 2.

## **Results**

**Table 1. Vegetation Monitoring Results**

<b>Transect</b>	<b>Azimuth</b>	<b>Location</b>	<b>Vegetation Cover May 2020</b>	<b>Vegetation Cover June 2020</b>
1 37.06387/ -107.53212	342°	Flow path	Vegetation Cover = 66% Bare Ground = 6%	Vegetation Cover = 42% Bare Ground = 6%
2 37.06413/ -107.53228	340°/346°	Flow path	Vegetation Cover = 66% Bare Ground = 0%	Vegetation Cover = 90% Bare Ground = 0%

Notes: Vegetation Cover includes all points with a top canopy present. Bare ground includes points with no top or lower canopy present and only soil at the soil surface.

Vegetation cover was 42% in Transect 1 and 90% in Transect 2 in the June 2020 vegetation monitoring event, which is a 24% reduction in vegetation cover in Transect 1 and a 24% increase in vegetation cover in Transect 2 from the May 2020 monitoring event. Bare ground made up 6% of Transect 1 and there was no bare ground observed in Transect 2, which is consistent with the May 2020 monitoring event. Transect 1 was saturated due to flood irrigation. Transect 2 was located within an irrigation-influenced wetland area with flowing water.

## **Conclusion**

Based on vegetation monitoring conducted on June 16, 2020, the vegetation within the flow path on the Tiffany Gathering site is consistent with seasonal conditions and surrounding vegetative conditions. Vegetation cover in Transect 2 increased compared to the May 2020 monitoring event. Vegetation cover in Transect 1 decreased; however, this is likely due to disturbance from the recent reclamation activities. There were no significant changes in bare ground observed.

Future monitoring events will be used to evaluate potential site changes over time. The next monitoring event is scheduled for July 2020.

Should you have any questions, please do not hesitate to contact me at 208-610-6012. Cottonwood appreciates the opportunity to provide services to BP.

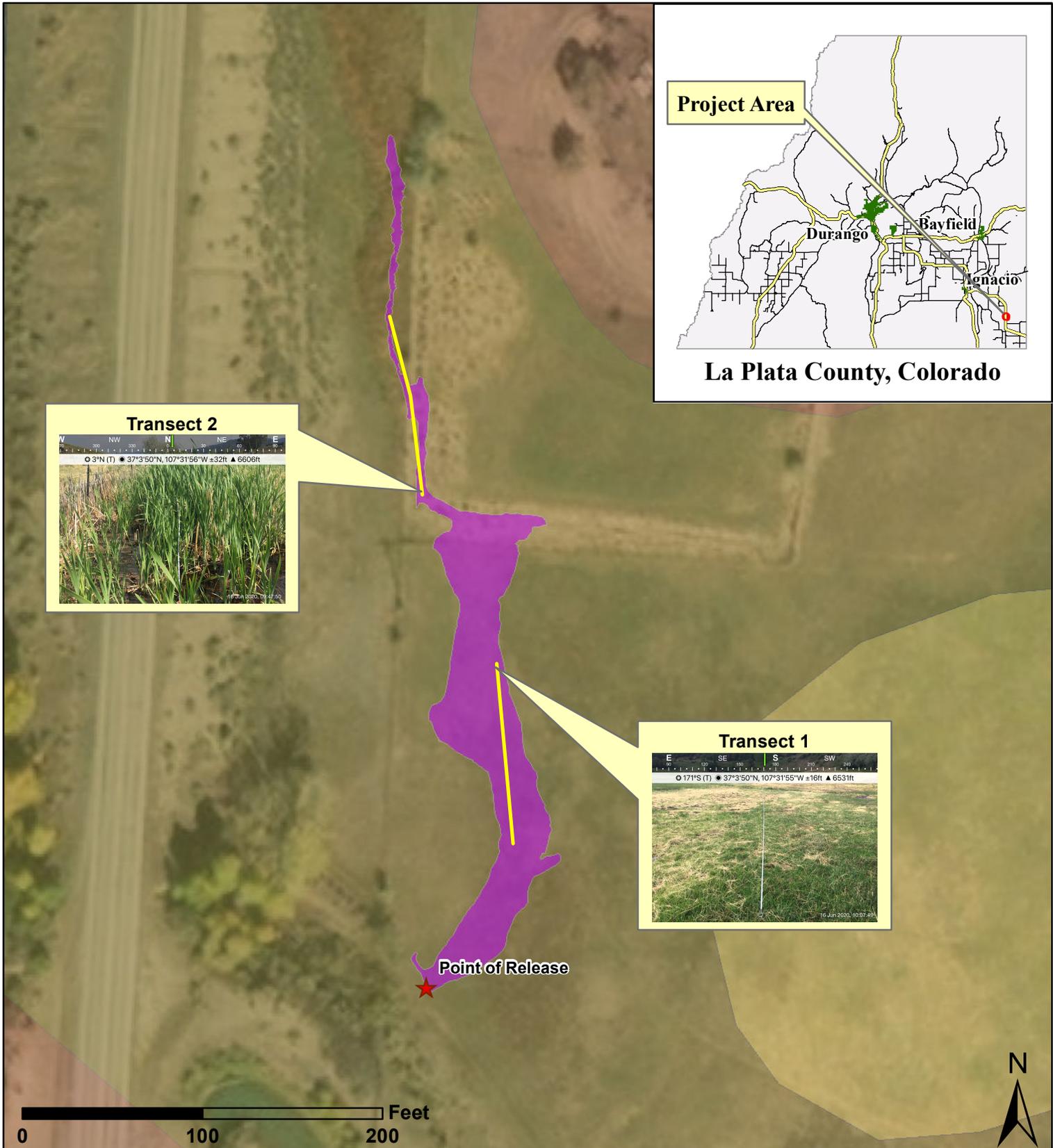
Sincerely,

A handwritten signature in black ink, appearing to read 'Emma Millar', written in a cursive style.

Emma Millar, Biologist  
Cottonwood Consulting LLC

Attachments: Figure 1 – June 2020 Vegetation Monitoring Map  
Attachment 1 – Photo Log  
Attachment 2 – Line-Point Intercept Data Forms and Species Table

**FIGURE 1**



**Project Area**



**La Plata County, Colorado**

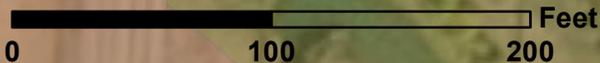
**Transect 2**



**Transect 1**



**Point of Release**



**Legend**

-  Point of Release
-  Vegetation Transects
-  Wet Area (4/8/2020)
- Soil Type**
-  Bayfield silty clay loam, 1-3%
-  Sili clay loam, 3-6%
-  Zyme clay loam, 3-25%



Mapping by: E. Millar, 6/18/2020

Coordinate System:

NAD 1983 UTM Zone 13 N

Location: Sec 32 T33N R6W NMPM

**Tiffany Gathering  
June 2020  
Vegetation Monitoring Map  
BP America Production Co.**

**ATTACHMENT 1**

**Tiffany Gathering  
Vegetation Monitoring  
Photographic Log  
BP America Production Co.**



Photo 1: Start of Transect 1, 6/16/2020.



Photo 2: Start of Transect 2, 6/16/2020.

**ATTACHMENT 2**

**Line-Point Intercept Data Form  
Transect T1  
Tiffany Gathering  
BP America Production Company**

**Project:** Tiffany Gathering  
**Transect:** T1  
**Direction:** 342°  
**Date:** 6/16/2020

**Observer:** EM  
**Recorder:** TL  
**Transect Length:** 100ft  
**Spacing Interval:** 2ft

Pt.	Top Canopy	Lower Canopy	Lower Canopy	Soil Surface	Pt.	Top Canopy	Lower Canopy	Lower Canopy	Soil Surface
1	Timothy	-	-	S	26	Timothy	L	-	S
2	Timothy	-	-	EL	27	Timothy	L	-	S
3	Timothy	L	-	S	28	-	L	-	S
4	Timothy	-	-	S	29	-	L	-	S
5	Timothy	L	-	EL	30	Timothy	L	-	S
6	Rush	L	-	S	31	-	L	-	S
7	-	L	-	EL	32	Timothy	-	-	S
8	Timothy	L	-	S	33	-	-	-	Irrigation Ditch
9	Timothy	L	-	S	34	-	-	-	S
10	-	L	-	EL	35	-	L	-	EL
11	Timothy	L	-	S	36	Timothy	-	-	S
12	Timothy	L	-	S	37	Rush	L	-	S
13	-	L	-	EL	38	-	-	-	S
14	-	L	-	S	39	-	L	-	S
15	-	L	-	S	40	-	L	-	EL
16	-	L	-	S	41	Rush	L	-	S
17	-	L	-	S	42	-	L	-	S
18	-	L	-	S	43	-	L	-	S
19	-	-	-	S	44	Rush	L	-	S
20	-	-	-	EL	45	Rush	L	-	S
21	-	L	-	S	46	-	L	-	S
22	-	L	-	S	47	-	L	-	S
23	-	L	-	S	48	-	L	-	S
24	Rush	-	-	S	49	-	L	-	S
25	Timothy	Rush	L	S	50	-	-	-	EL

**Notes:**

% Vegetation Cover (top canopy intercepts) = 42%

% Bare Ground\* = 6%

\* - Bare ground occurs only when canopy layers are empty and Soil Surface = S.

Vegetation along the transect was consistent with seasonal and surrounding conditions.

Soil was saturated due to flood irrigation.

L - Litter

EL - Embedded Litter

S - Soil

**Line-Point Intercept Data Form  
Transect T2  
Tiffany Gathering  
BP America Production Company**

**Project:** Tiffany Gathering  
**Transect:** T2  
**Direction:** 340°/346°  
**Date:** 6/16/2020

**Observer:** EM  
**Recorder:** TL  
**Transect Length:** 100ft  
**Spacing Interval:** 2ft

Pt.	Top Canopy	Lower Canopy	Lower Canopy	Soil Surface	Pt.	Top Canopy	Lower Canopy	Lower Canopy	Soil Surface
1	Cattail	-	-	W	26	Cattail	-	-	W
2	Cattail	-	-	W	27	Cattail	-	-	W
3	Cattail	-	-	W	28	Cattail	-	-	W
4	Cattail	-	-	W	29	Cattail	-	-	W
5	-	L	-	W	30	Cattail	L	-	W
6	Cattail	L	-	W	31	Cattail	-	-	W
7	Cattail	-	-	W	32	Cattail	-	-	W
8	Cattail	-	-	W	33	Cattail	-	-	W
9	Cattail	L	-	W	34	Cattail	L	-	W
10	Cattail	-	-	W	35	Cattail	-	-	W
11	Cattail	L	-	W	36	Cattail	-	-	W
12	-	-	-	W	37	Cattail	-	-	W
13	Cattail	L	-	W	38	Cattail	-	-	W
14	-	-	-	W	39	Cattail	-	-	W
15	Cattail	L	-	S	40	Cattail	-	-	W
16	-	L	-	W	41	Cattail	-	-	W
17	Cattail	-	-	W	42	Cattail	-	-	W
18	Cattail	L	-	W	43	Cattail	-	-	W
19	Cattail	Prickly lettuce	L	EL	44	Cattail	-	-	W
20	Cattail	L	-	W	45	Cattail	-	-	W
21	Cattail	L	-	W	46	Cattail	-	-	W
22	-	L	-	W	47	Cattail	-	-	W
23	Cattail	Unknown Forb	-	W	48	Cattail	-	-	W
24	Cattail	-	-	W	49	Cattail	-	-	W
25	Cattail	-	-	W	50	Cattail	-	-	W

**Notes:**

% Vegetation Cover (top canopy intercepts) = 90%

% Bare Ground\* = 0%

\* - Bare ground occurs only when canopy layers are empty and Soil Surface = S.

Vegetation along the transect was consistent with seasonal and surrounding conditions.

Transect is located in an irrigation-influenced wetland with flowing water.

L - Litter

EL - Embedded Litter

W - Water

**Species Table**  
**Tiffany Gathering**  
**BP America Production Company**

Scientific Name	Common Name	Life Form
<i>Phleum pratense</i>	Timothy	Grass
<i>Juncus sp.</i>	Rush	Grass-like
<i>Typha latifolia</i>	Cattail	Grass-like
-	Unknown Forb	Forb
<i>Lactuca serriola</i>	Prickly Lettuce	Forb