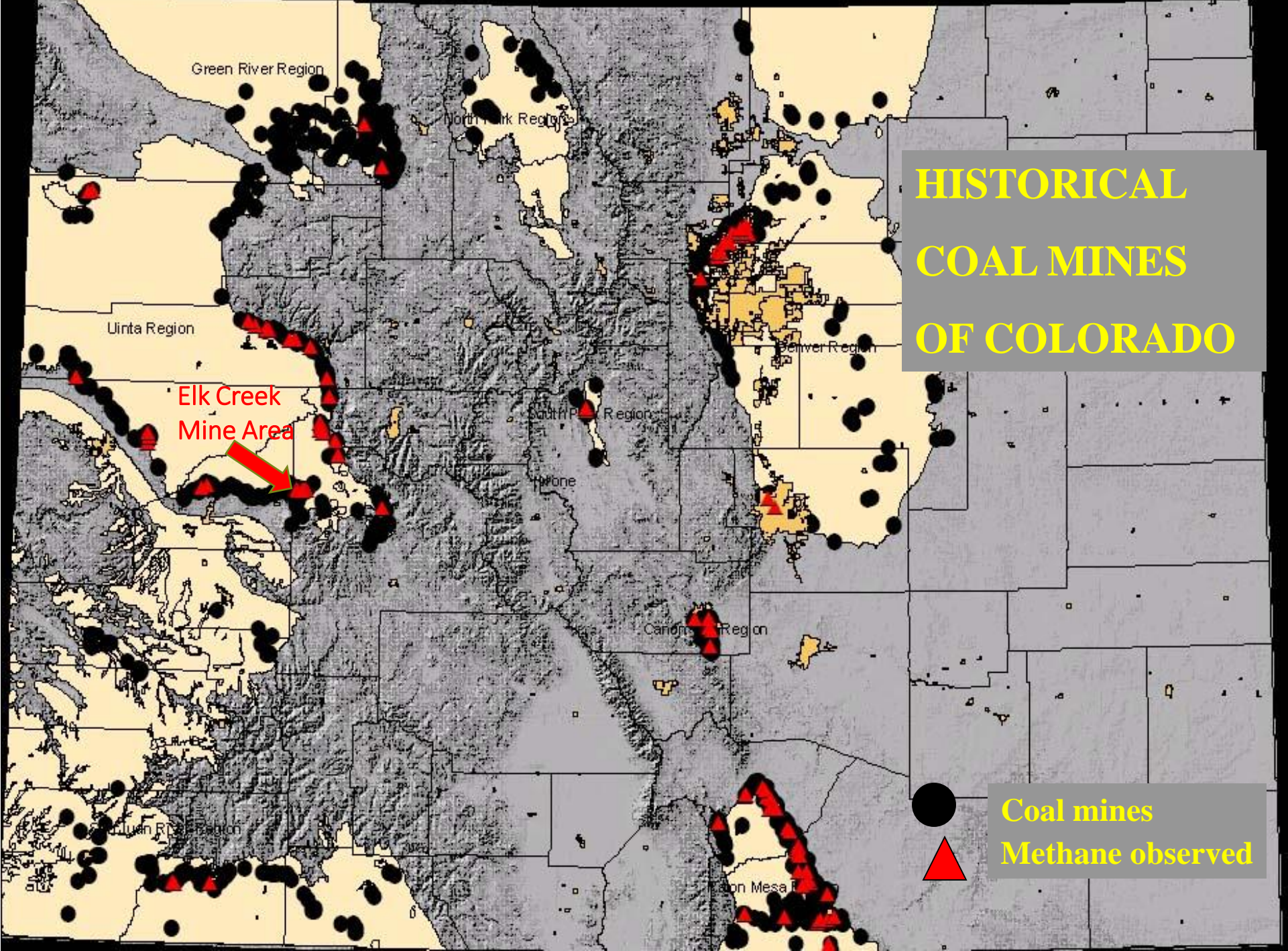


Vessels Carbon Solutions Inc.

Elk Creek Coal Permit Area
Abandoned Mine Project
ARB Project I.D. CAMM5367

prepared for
California Air Resources Board
2/27/2020

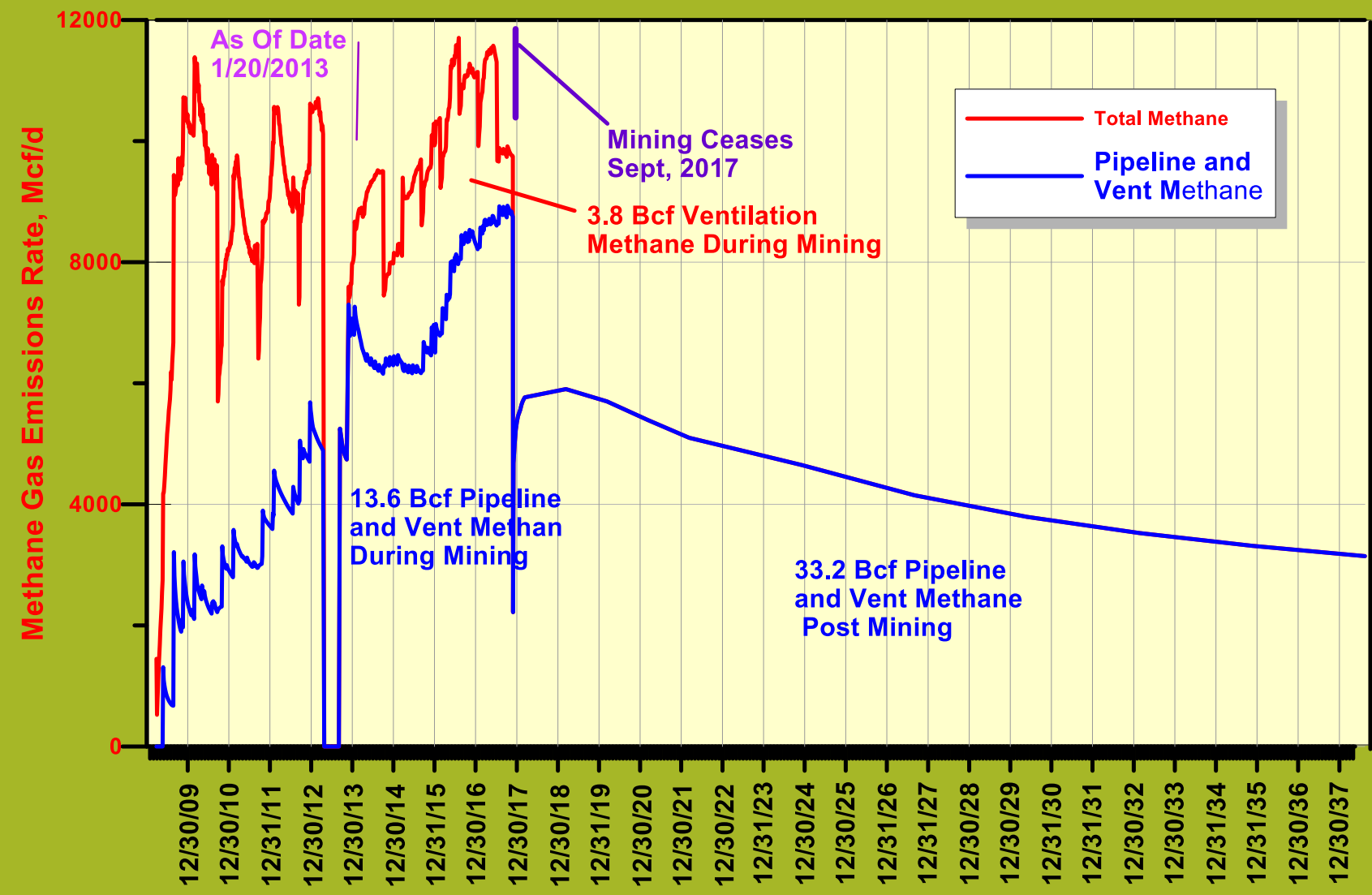
HISTORICAL COAL MINES OF COLORADO



Elk Creek
Mine Area

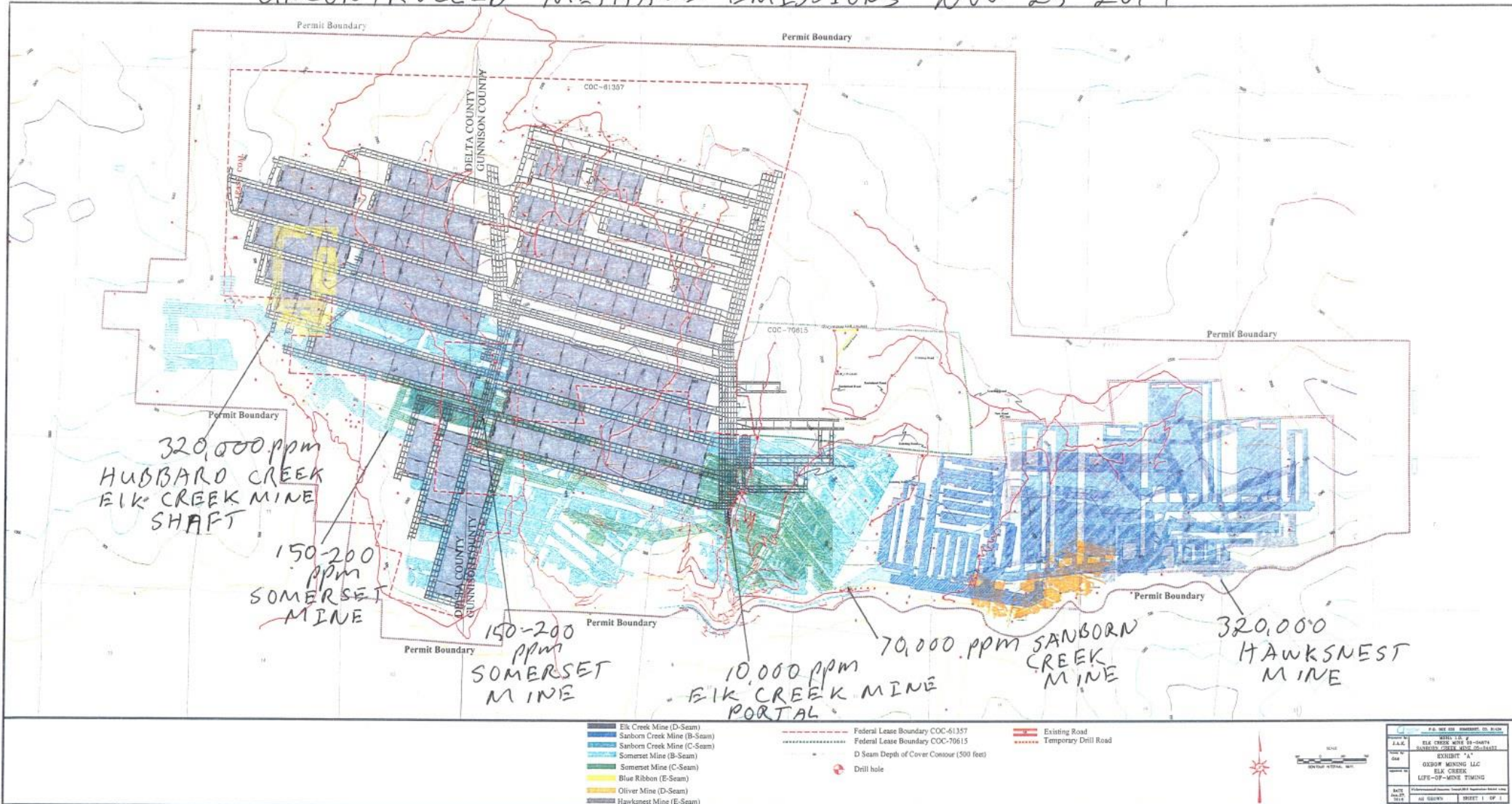
● Coal mines
▲ Methane observed

Computed Elk Creek Mine Methane Emissions



Area contains 8 closed mines.

UNCONTROLLED METHANE EMISSIONS NOV 25 2019



Vessels
Carbon
Solutions Inc.

ELK CREEK MINE CLOSED IN 2016.

PRODUCED OVER 5,000,000 TONS A YEAR OF COAL

MINE AREA COVERS 15,000 ACRES

EMITTING 6,000 TO 10,000 MCFPD OF METHANE

2,400 MCFPD OF EMISSIONS QUALIFY FOR CALIFORNIA AIR RESOURCE BOARD OFFSET CREDITS

THAT WILL PRODUCE POTENTIALLY OVER 300,000 CREDITS PER YEAR

MARKET FOR CREDITS IS ALMOST \$15 CREDIT

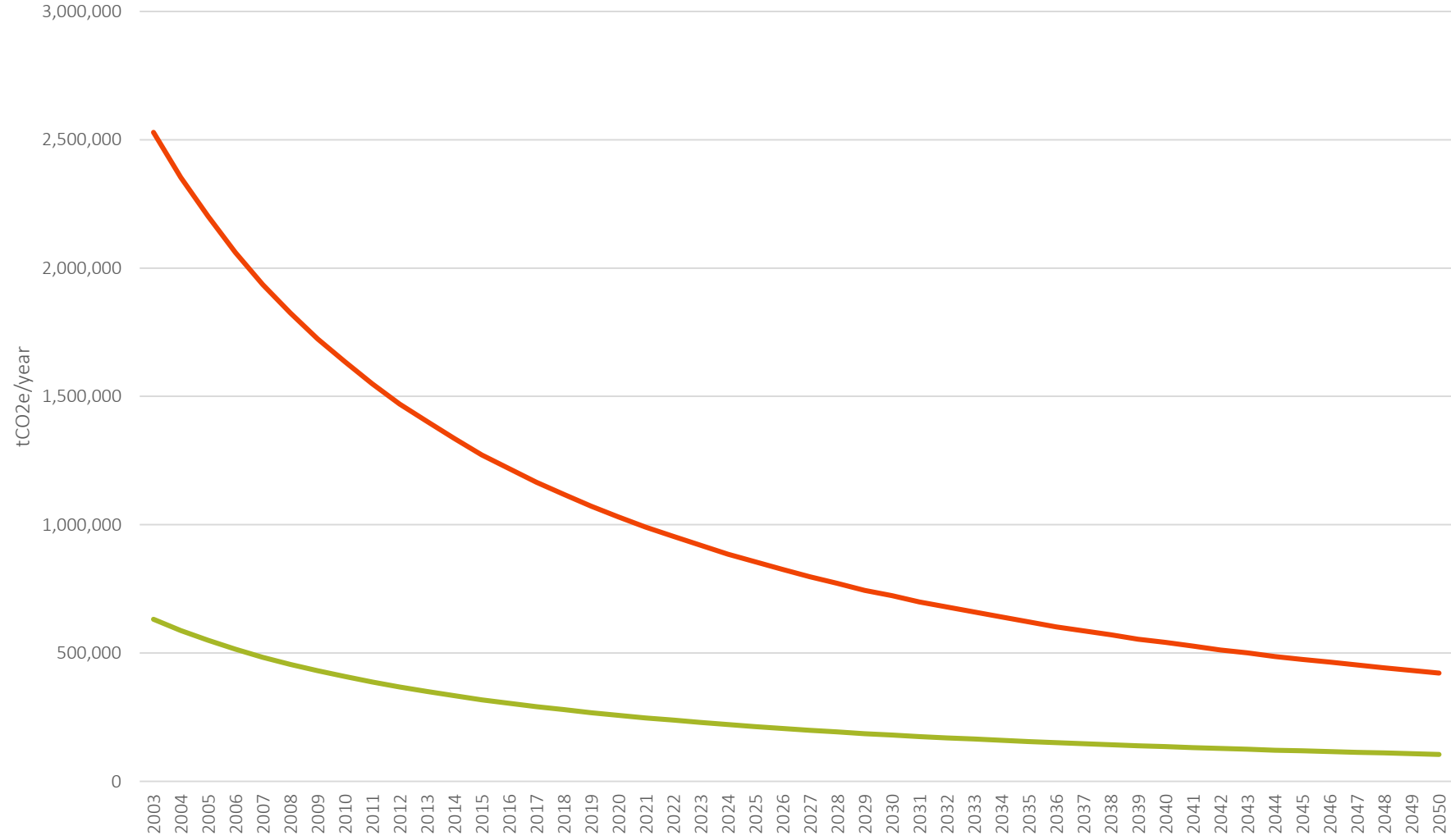
MARKET VALUE TODAY IS AROUND \$4,500,000

Elk Creek Mine Area is estimated to be emitting at least 6,000,000 cubic feet per day of methane equivalent to about 10,000 metric tons of CO₂ per day. That has approximately the same effect as:



**Daily emissions from \approx
750,000 CARS.**

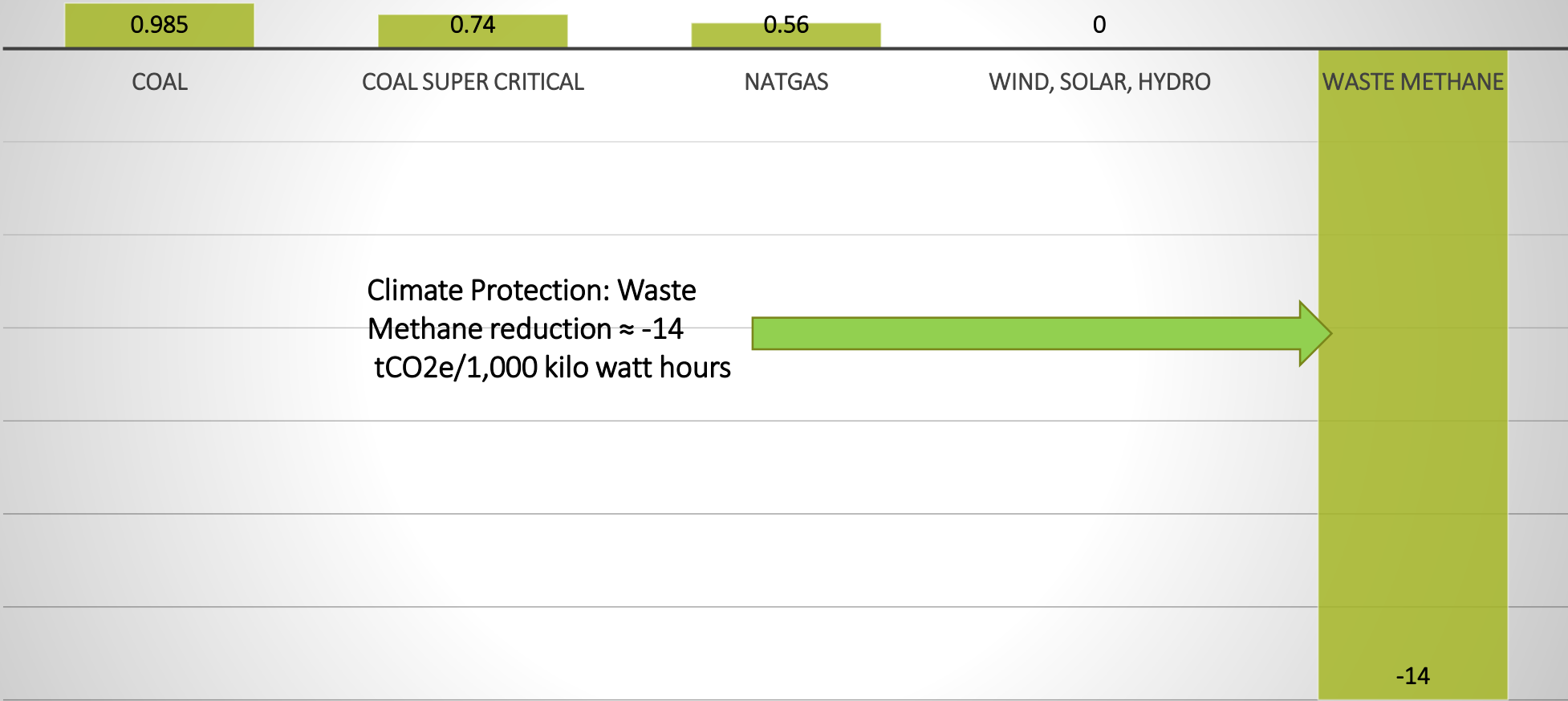
Emissions in tCO2e Based on GWP



GWP 21 GWP 84

Vessels Carbon Solutions Inc.

Direct Emissions of Metric Tons CO2 Equivalent /MWH With a 20 year GWP



Climate Damage: tCO₂e emissions/MWH



1 Mega Watt per day of electricity generation from waste methane avoids climate damage of 325 metric tons of CO₂e which had approximately the same effect as:



**Daily sequestering CO₂
by \approx 140,000 acres of
TREES.**



**Removing daily \approx
25,000 CARS from the
highways.**

9

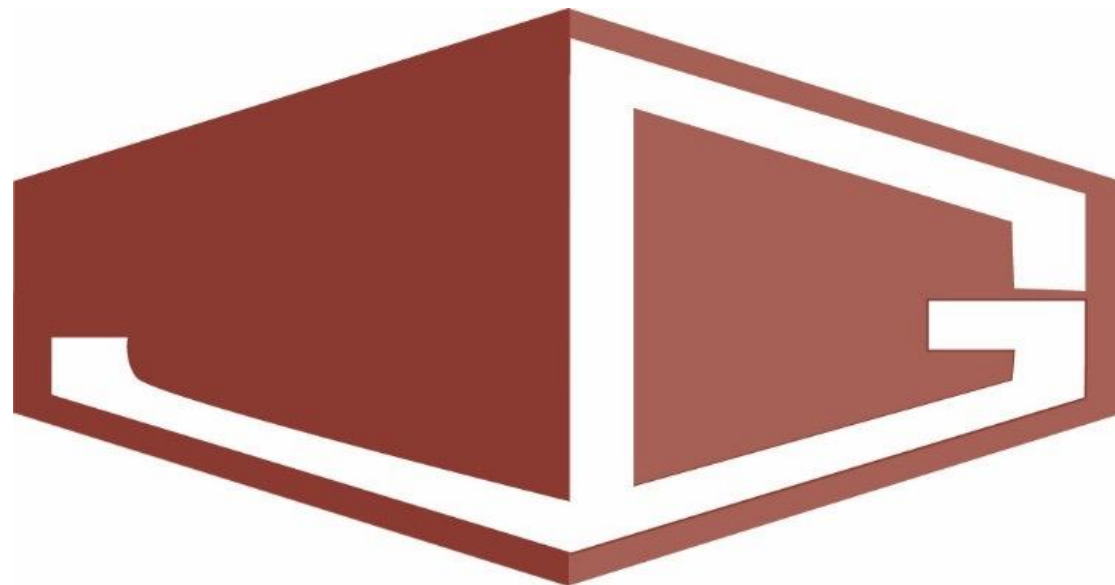
Making this real

Colorado Department of Health and Environment projected that in 2019 average daily methane emissions from within Colorado would be about 220 million cubic feet. That is equivalent to the daily CO2 emissions from 28 million passenger vehicles.



Estimated conversion assumptions.

- 9 thousand cubic feet of methane (mcf) \approx 1,000 kilo watt hours (kwhr).
- 1,000 kwhr = 1 Mega Watt Hour (MWH).
- 1MWHR x 24 hours x 365 days x 90% operating time \approx 22 MWHRs per day.
- 1 mcf of methane (CH₄) = 1.64 metric tons of Carbon Dioxide equivalent (tCO₂e) with a Global Warming Potential (GWP) of 84
- 22 MWHRS x 9 mcf methane *1.64 \approx avoids daily climate damage of 325 tCO₂e per day.
- 1 passenger vehicle is calculated to emit .013 tCO₂e per day.
- 1 acre of forest sequesters daily .0023 tCO₂e



Vessels Carbon Solutions

A METHANE CAPTURE COMPANY