



Concentrated Feeding Operations

An analysis of relevant Land Use Regulations regarding CFOs in Laramie County, Wyoming.

Cheyenne and Laramie County GIS Cooperative

March 16, 2020

This is an analysis of the current Laramie County Land Use Regulations as they pertain to Concentrated Feeding Operations. A copy of the published regulations can be found here:

[Laramie County CFO Regulations](#)

This regulation lays out a number of setback conditions that any new CFO must adhere too.

Purpose

The purpose of this analysis is to identify locations in Laramie County that are free from any setback conditions or exclusions. First, each setback has been mapped individually as described in regulation, with a brief description of the data used to generate the

setback layer. Next, the setback condition layers were merged together to create a total area of potential impact. This creates an effective visualization of where in Laramie County a potential CFO would encounter a need to meet one or more conditions under the current local regulations. Finally, sites in Laramie County that are not subject to any setback conditions are identified.

Additionally, models of what some setbacks would look like if reduced are included.

This analysis was done using the best available data and is current as of March 6th, 2020 unless otherwise noted.

Regulation Overview

Per the regulations, a CFO is defined as:

"..any housed facility, including any lagoon and other waste treatment facilities associated therewith, wherein livestock are confined, fed and maintained for a total of forty-five (45) consecutive days or more in any twelve (12) months, and the feed lot or facility is designed to confine an equivalent of 1,000 or more animal units."

Any planned facility that meets these criteria becomes subject to a series of setbacks that are listed in regulation. The setbacks requirements that must be adhered too are defined as follows:



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"A. Three (3) miles from an occupied dwelling without the written consent of the owner of the dwelling; ..."

To generate this the GIS Cooperative address layer was filtered to only include addresses that are determined to be of residential use. This layer is maintained jointly by City Engineering and County Planning, and is updated when new addresses are assigned by either entity. The 'use' attribute is determined by the applicant when they submit a request for approval, and is verified by the staff member entering the address into the GIS.

The map to the right shows all of the land in Laramie County that is within three miles of a residential address. A proposed CFO located in the shaded area, would need to receive consent from the owner of any occupied dwellings within three miles of the CFO

Click below to see what this setback would look like under different conditions:

"B. Three (3) miles from a public or private school without the written consent of the school board of trustees or board of directors; ..."

This data is provided to the Cooperative by the School Districts and through the work of the Laramie County Health Department and

Laramie County Sheriff's Department. The layer is updated whenever we are provided with new information from a school district or private school.

A proposed CFO located in the shaded area would need to seek the consent of the relevant school board in order to meet the setback requirement.

Click below to see what this setback would look like under different conditions:

"C. Three (3) miles from the boundaries of any incorporated municipality without the resolution and consent of the governing body of the municipality; ..."

There are four incorporated municipalities in Laramie County: the Towns of Albin, Burns, and Pine Bluffs and the City of Cheyenne. This analysis is based off of the Cooperative's annexation layer, which is maintained by City Engineering and is updated whenever an annexation is approved by a town or city council.

Any CFO within the shaded area would need to have consent from the relevant town or city council in order to meet the setback requirement.

Click below to see what this setback would look like under different conditions:

"D. One-half (1/2) mile from a water well permitted for current domestic purposes without the written consent of the owner of the well; ..."

This layer is based off of the Cooperative's Well data which is maintained by the City/County Health Department's Environmental Health Division. This data is created from domestic well permit applications and is verified by staff.

Any CFO in the shaded area would need to have consent from the well owners within a one-half mile radius of the facility in order to meet the setback requirement.

"E. One-half (1/2) mile of a perennial stream."

The Cooperative stream layer is maintained by County Planning and the City Engineering Office and is changed whenever new information is provided by FEMA. The 'perennial' designation is made by FEMA. This analysis was performed on all stream segments marked as such.

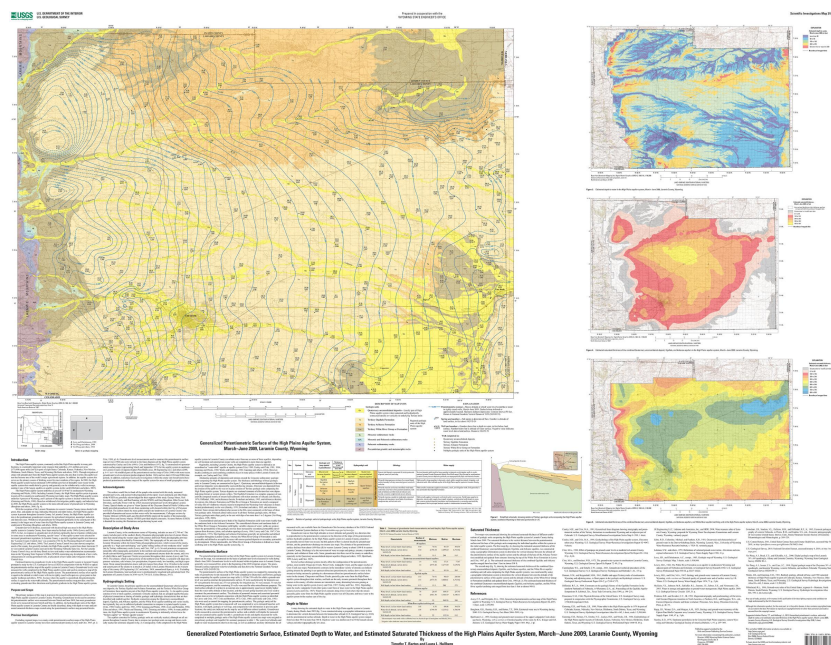
Note: The Laramie County Land Use Regulations do not define the term "perennial stream" so this analysis uses the broadest possible interpretation available in the Cooperative data.

For the purposes of this analysis, new CFO's are prohibited in the shaded area. Proposed CFO's in this area would be unable to meet the setback condition.

Lastly, the regulations address the location of a proposed CFO in relation to groundwater:

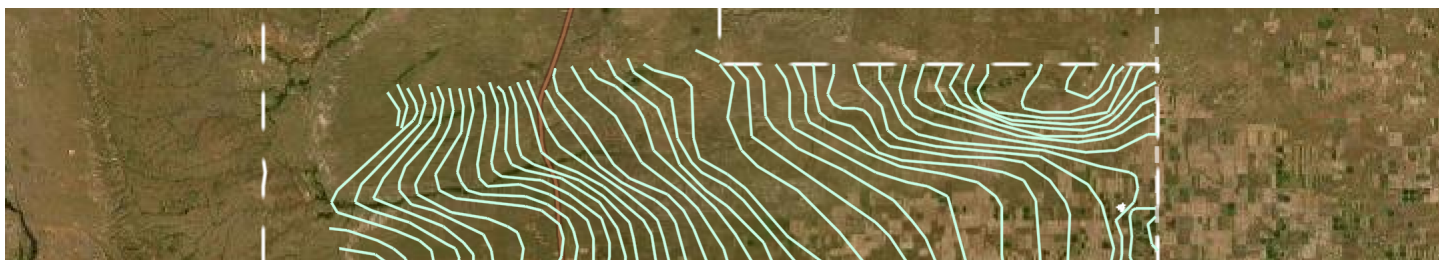
"No structures housing livestock, or the waste treatment works and lagoons associated therewith, shall be located on any real property wherein the mean static groundwater table is less than 150 feet below the surface."

The "... mean static groundwater table" term is not defined in the Land Use Regulations, and this data is not readily available within our authoritative Cooperative database. For this analysis we were able to generate a spatial representation of groundwater depth using a raster analysis which is detailed below. The result is for **illustrative purposes**, to represent areas in Laramie County where this exclusion could potentially become an issue. It is not intended to be used to enforce existing policy, and should not be used as such.



USGS Study

The basis for this analysis is a study published by the USGS in 2011. Using data from over 300 wells and previous geological surveying. The authors generated a 'generalized potentiometric surface'. This is the general elevation one can expect to find groundwater in an area. With this surface a variety of information can be estimated, including the depth to groundwater over the surface.



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Potentiometric Surface

The Cooperative has on hand from the most recent Aquifer Study provided by the State Engineers Office a potentiometric surface that was calculated in 2004. The Contours occur at 50 foot intervals.

Note: This is very old data, that does not cover the entire county, and has likely changed significantly over time. It being used here for illustrative purposes only.

From these contours a GIS tool was used to generate a raster dataset with a resolution of 10 meters. This tool interpolates the elevation value of each pixel based on its proximity to the nearest contours.

Estimated Depth-to-Groundwater

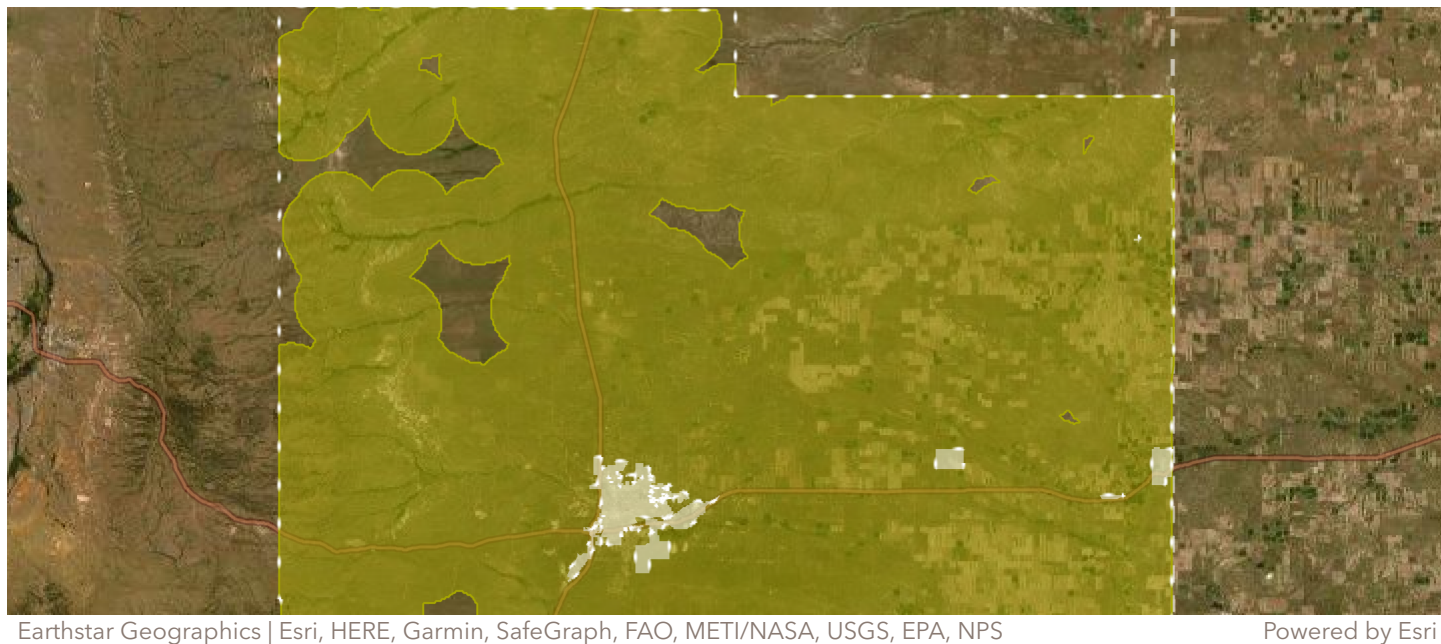
Next, a 10 meter resolution Digital Elevation Model was created for the surface elevations. This was derived from the 2019 Cooperative LiDAR flight.

The potentiometric surface was then subtracted from the ground surface. The resulting layer is able to show us where the estimated depth-to-groundwater is less than 150 feet.

For the purposes of this analysis, potential CFO's would be unable to be constructed under the current groundwater setback condition, any place the map is shaded red.

Results

Once all of the areas in Laramie County affected by setbacks were identified, the polygons were merged together to identify the area of the county that fell outside of any setbacks or exclusions.



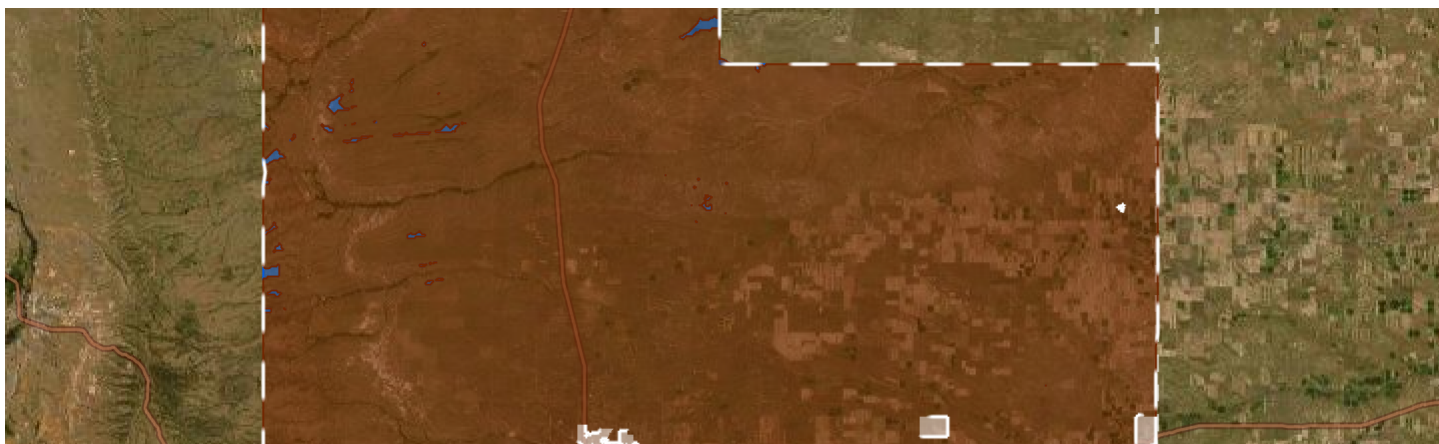
Setbacks That Require Consent

This layer merges all of the setbacks, as written, that can be conditionally approved with the consent of the parties listed in the regulation. Any potential CFO located in the shaded area would need to acquire consent from any residents, towns, or school boards within three miles of the proposed facility.

Click below to see what this layer would look like under different conditions:

Exclusions

This layer merges the estimated depth-to-groundwater analysis, and the broadest interpretation of the perennial stream layer to show areas that exclude CFO's entirely, for the purposes of this analysis.



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Unregulated Area

This map shows in blue, areas of the county that are not subject to any regulation as determined in this analysis. The remainder is subject to one or more setback conditions or exclusions.

Currently, 0.43% of the county does not fall under any CFO setback or exclusion in the Land Use Regulations.

Click below to see how reducing setbacks would affect this analysis (Percentages reflect unregulated area).

These hypothetical models reflect only changes to the setbacks for occupied dwellings, schools, and incorporated areas. The setbacks and exclusions for perennial streams, groundwater, and domestic wells are unchanged.

If there are any questions or concerns surrounding this analysis, please reach out to the Cheyenne and Laramie County GIS Cooperative.



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