



DEPARTMENT OF
ECOLOGY
State of Washington

Economic Impact Analysis

*Final Concentrated Animal Feeding Operation
General Permit*

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Economic Impact Analysis

Concentrated Animal Feeding Operation General Permit

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Executive Summary

The Concentrated Animal Feeding Operations (CAFO) National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit (combined permit) and CAFO State Waste Discharge Permit (state-only permit) are statewide general permits that cover discharges of pollutants (the addition of manure, litter, process wastewater, and other pollutants to the waters of the state) associated with operating CAFOs within the State of Washington. The combined permit conditionally authorizes discharges to surface and groundwater while the state-only permit conditionally authorizes discharges to groundwater.

Permit requirements include:

1. Waste storage.
2. Management of mortalities.
3. Diversion of clean water.
4. Prevention of direct animal contact with water.
5. Chemical handling.
6. Conservation practices to control nutrient loss.
7. Manure, litter, and process wastewater sampling and nutrient analysis.
8. Soil sampling and nutrient analysis
9. Protocols for land application of manure, litter, and process wastewater.
10. Record keeping.
11. One-time lagoon inspection.
12. Manure Pollution Prevention Plan (MPPP)
13. Planning and implementation of repairs for high-risk lagoons

The estimated five-year present-value costs for complying with the final general permit, based on best available data and current requirements for compliance with other regulatory frameworks (e.g. RCW 90.64) for facilities covered under the general permit appears below in Table 1.

Table 1: Summary of estimated compliance costs per CAFO

Baseline for comparison (2016\$)	State only	Combined
Manure, litter, process wastewater, and nutrient analysis	\$756	\$1,154
Soil Sampling		
Low	\$1,565	\$3,150
High	\$7,675	\$9,250
Permit Fees	\$2,445	\$9,056
Manure pollution prevention plan		
Low	\$0	\$0
High	\$9,800	\$9,800
Lagoon assessment, planning and repair		
Low	\$0	\$0
High	\$338,500	\$338,500

While the vast majority of covered businesses are small businesses (having less than fifty employees), there are both small and large businesses in the CAFO industry. Overall, CAFOs average 7.9 employees. Among the small business CAFOs, the average is 6.8 employees, and the large business CAFOs average 79 employees.

It is likely the costs of complying with the permit are disproportionately higher for small businesses, as defined by number of employees.

To mitigate the burden on small businesses, Ecology has included a lower threshold of animal numbers below which a CAFO does not have to apply for a permit unless Ecology determines the small CAFO is a significant contributor of pollutants.

Chapter 1 Overview

1.1 Purpose of the analysis

NOTE: Ecology is required to develop an Economic Impact Analysis (EIA) for draft general permits intended to directly cover small businesses, and publish it along with the draft general permit. While an updated EIA is not required for final general permits, Ecology has chosen to publish an updated EIA for the final Concentrated Animal Feeding Operations (CAFO) General Permits because of the types of changes made to the final permit in response to public comments, the breadth of newly covered permittees, and the degree of public interest in the permit.

The Concentrated Animal Feeding Operations (CAFO) National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit (combined permit) and CAFO State Waste Discharge Permit (state-only permit) are statewide general permits that cover discharges of pollutants (the addition of manure, litter, process wastewater, and other pollutants to the waters of the state) associated with operating CAFOs within the State of Washington. The combined permit conditionally authorizes discharges of waste to surface and groundwater while the state-only permit conditionally authorizes discharges to groundwater.

The Washington State Department of Ecology's (Ecology) Waste Discharge General Permit Program rule (Washington Administrative Code (WAC) 173-226-120) requires an economic impact analysis of any draft wastewater general permit intended to directly cover small businesses.

This analysis is required to include:

- A brief description of the compliance requirements of the draft general permit.
- The estimated costs for complying with the draft general permit, based on existing data and current requirements for compliance with other regulatory frameworks (e.g. RCW 90.64) for facilities covered under the final general permit.
- A comparison, to the greatest extent possible, of the cost of compliance for small businesses, with the cost of compliance for the largest ten percent of businesses covered under the draft general permit.
- Discussion of mitigation the draft general permit provides to reduce the effect on small businesses (if a disproportionate impact is expected), without compromising the mandated intent of the final general permit.

As stated previously, an EIS is not required for the issuance of a final general permit, only a draft general permit. Due to the interest in the CAFO permits, Ecology has chosen to update the EIS that was available with the draft permits to reflect the changes made in the final permits. The same analysis requirements used for draft permits was used for the final permits.

A definition of small business is not included in chapter 173-226 WAC. Therefore, to maintain consistency, Ecology uses the definition found in the Regulatory Fairness Act (RCW 19.85.020(3)) defines a small business as any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees. The requirements of chapter 19.85 RCW do not apply to the development of water quality permits.

Achieving reductions in the economic impact of compliance costs as required by WAC 173-226-120(2), may be done by:

- Establishing different compliance and reporting requirements for small businesses.
- Clarifying, consolidation, or simplification of compliance and reporting requirements.
- Establishing performance standards instead of design standards.
- Exempting small businesses from parts of the final general permit.

This analysis does not include assessment of economic benefits (of the permit), environmental impacts, or impacts to surrounding communities. It only estimates the additional costs borne by expected Permittees resulting from compliance with the requirements of the final general permit.

1.2 Permit history

The Federal Clean Water Act (CWA) establishes water quality goals for navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the CWA are the NPDES permits.

The United States Environmental Protection Agency (EPA) has delegated the responsibility for administering the NPDES permit program in the state of Washington to Ecology. The delegation of authority is based on Chapter 90.48 RCW, which defines Ecology's authority and obligations in administering the NPDES permit program.

When developing and issuing NPDES permits Ecology must comply with the federal Clean Water Act and EPA's implementing regulations. Ecology does not have the authority to issue NPDES permits to federal facilities or on federal and Tribal Lands.

The CAFO general permit covers the animal and animal product industry and its supporting activities. This covers:

- Milk cows
- Beef
- Veal
- Raising heifers
- Pigs
- Poultry (chickens, turkeys, and ducks)
- Sheep
- Horses

The CAFO general permit may cover other animal types if Ecology determines the facility is a significant contributor of pollutants to state waters and meets the definition of a CAFO.

Only CAFOs that discharge pollutants into surface or ground waters are required to obtain a permit. All CAFOs have the ability to avoid the necessity of a permit by not discharging to state waters. For the 2005 general permit, there were only 12 permitted CAFOs, and one individually permitted CAFO. The 2005 general permit did not include dairies in the definition of a CAFO. Based on data available on dairies, the universe of CAFOs is much larger, however – upwards of 450 operations.

CAFOs are defined as a point source of pollution in the CWA, Section 502(14) if there is a discharge to surface waters. Sources of pollution from CAFOs include, but are not limited to:

- Manure and litter generated by livestock.
- Process waste water from production (e.g. milk parlor wash water, egg wash water)
- Run-off from composting or silage leachate.

Manure, litter, and process wastewater contain nitrogen and phosphorus compounds (which feed the growth of algae and bacteria) as well as fecal coliform bacteria. The content is variable depending on animal type, feeding regime, and other facility practices.

The combined permit and state-only permit are a reissuance of the 2005 CAFO General Permit that expired July 21, 2011. The CAFO permit is a general permit, which covers a category of dischargers that have the same or similar discharge characteristics. All dischargers covered under a general permit receive the same permit conditions. This reduces the overall workload associated with writing and administering general permits.

The main difference between the proposed general permit and the 2005 CAFO general permit, is the inclusion of groundwater discharges in addition to the surface water discharges previously covered. This is likely to increase the number of permitted CAFOs by 250-300, mostly dairies.

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Chapter 2 Requirements of the Final General Permit

2.1 Baseline

WAC 173-226-120 describes the costs that Ecology is required to examine in this economic impact analysis. However, there are certain requirements that Ecology does not include in the analysis, and these requirements are discussed in this section.

The baseline for an economic analysis is the regulatory context of an industry in the absence of the proposed general permit. When adopting a state CAFO general permit, at a minimum Ecology must meet the federal requirements. Ecology must also meet any state rules.

For many types of CAFOs, this baseline is the existing state and federal water quality protection regulations (e.g. Clean Water Act, State Water Pollution Control Act). The dairy segment may be the largest CAFO industry segment that is covered by either the combined permit or state-only permit. Being the largest industry segment, costs to dairies above baseline (RCW 90.64 requirements) are used to represent costs to CAFOs from permit requirements.

Existing baseline requirements for dairy operations in Washington are set in chapter 90.64 RCW, the Dairy Nutrient Management Act, outside of any Ecology permit program.

RCW 90.64.026(1) requires all dairies to have a dairy nutrient management plan (NMP). RCW 90.64.026(2) requires that the NMP contain the elements established by the conservation commission¹.

Many of the elements of a NMP are incorporated into the combined and state-only permits. Because dairies are likely to be the main industry segment covered by the combined and state-only permits, current requirements under chapter 90.64 RCW and the dairy nutrient management act are considered part of the baseline for analyzing additional permit related costs to CAFOs.²

Even if the CAFO general permit did not exist, CAFOs operating in Washington State would be required to comply with the federal and state rules. If the combined and state-only permit requirements are not more stringent than the federal or state laws and rules, they are not considered as additional costs in this economic impact analysis because they would still be incurred to comply with the law.

¹ The elements established by the commission can be found at: <http://agr.wa.gov/FoodAnimal/Livestock-Nutrient/DairyNutrientMgmtPlans.aspx>

² Dry lot manure is not liquid and CAFOs using it would not have liquid lagoon storage.

As such, this economic impact analysis only analyzes the additional costs resulting from the general permit that are more stringent than those in the federal and state laws and rules. In addition to the federal CAFO rule, other pertinent standards set in state and federal law or rule are:

- Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC).
- Ground Water Quality Standards (Chapter 173-200 WAC).
- Sediment Management Standards (Chapter 173-204 WAC).
- Human health based criteria in the National Toxics Rule (40 CR 131.36).
- Dairy Nutrient Management Act (Chapter 90.64 RCW).

Ecology uses the requirements set in a state rule as the baseline and we analyze requirements in Ecology's final combined and state-only permit that are more stringent than the rule requirements.

Some requirements of the federal CAFO rule are non-specific. For example, the federal rule states that CAFOs must maintain "adequate" waste storage, but is non-specific about what is "adequate" or how to achieve adequacy. Even if certain requirements are partially due to the directives of the federal rule, they are not separable from the proposed general permit's specific requirements.

Ecology also uses the requirements set in, the federal CAFO rule and state law chapter 90.64 RCW as the baseline and we analyze requirements in Ecology's final general permit that are more stringent than the federal rule or state law. However, if the federal CAFO rule mandates a requirement, but is not specific about how to meet that requirement, we compare to two baselines (both including the requirements of Chapter 90.64 RCW):

1. **Baseline 1: The EPA's Idaho CAFO general permit.**

Certain Ecology requirements are more stringent in comparison to the EPA-set requirements for CAFOs in Idaho.

We present estimates using EPA's Idaho CAFO general permit as a baseline, because in the absence of Ecology as a permitting authority, the permitting authority for the state would be the EPA. In cases where the EPA CAFO rule is non-specific about its requirements, we compare to the EPA CAFO general permit in Idaho as a proxy for how the EPA might permit in Washington State. The EPA is the permitting authority in Idaho. Washington State and Idaho have different characteristics, however, and the EPA would not necessarily mandate the same requirements.

2. **Baseline 2: No federal mandate.**

The total cost is then attributed to Ecology's discretion, because, in such a situation, there would be no law or statute specifying what Ecology must put in a permit and requirements would be based solely on Ecology's discretion. Discretion refers to the requirements Ecology chose to include in the general permit that are more stringent than the baseline (no permit requirement).

2.2 Permit requirements

Permit requirements include:

1. Waste storage.
2. Management of mortalities.
3. Diversion of clean water.
4. Prevention of direct animal contact with water.
5. Chemical handling.
6. Conservation practices to control nutrient loss.
7. Manure, litter, and process wastewater sampling and nutrient analysis.
8. Soil sampling and nutrient analysis
9. Protocols for land application of manure, litter, and process wastewater.
10. Record keeping.
11. One-time lagoon inspection.
12. Manure Pollution Prevention Plan (MPPP)
13. Planning and implementation of repairs for high-risk lagoons

The impact, if any, on Permittees of each requirement is discussed below.

2.3 Waste storage

The EPA CAFO rule does not specify requirements for waste storage beyond that the CAFO must have adequate storage. The requirements for waste storage are identical to those mandated by the EPA CAFO rule and largely similar to chapter 90.64 RCW requirements. As such, they are not analyzed in this document.

2.4 Management of mortalities

Ecology's general permit requirements for management of mortalities are the same as the federal rule, with the exception of additional state requirements mandated by RCW 16.36, 70.95, and WAC 16-25, 173-350, 246-121. The state rules dictate, for example, burial or composting setbacks away from well heads, property lines, and flood plains. Chapter 90.64 RCW does not include requirements for management of mortalities.

Because these additional state requirements are mandated by existing law or rule they are considered part of the baseline and as a result they are not analyzed in this document.

2.5 Diversion of clean water

The requirements for diversion of clean water are identical to those mandated by the EPA CAFO rule and largely similar to chapter 90.64 RCW requirements. These include diverting clean water away from facilities through the use of gutters, berms, or other methods. Because they are mandated by federal rule, they are not analyzed in this document.

2.6 Prevention of direct animal contact with water

Combined permit

For the combined permit, the requirements for preventing direct animal contact with water are identical to those mandated by the EPA CAFO rule. As such, they are not analyzed in this document.

State-only permit

Chapter 90.64 RCW does not include requirements for preventing direct animal contact with water. Therefore, for the state only permit, some additional costs may be incurred due to this requirement, however they would be minimal.

2.7 Chemical handling

Combined permit

For the combined permit, the requirements for chemical handling are identical to those mandated by the EPA CAFO rule. As such, they are not analyzed in this document.

State-only permit

For the state only permit, Chapter 90.64 RCW does not include requirements for chemical handling, therefore, Permittees will likely incur additional costs in this area. However, it is not possible to estimate likely costs with any level of certainty, as costs will be site-specific and will likely be small in magnitude.

2.8 Conservation practices to control nutrient loss

Combined permit

Under Chapter 90.48 RCW, discharge of pollutants into state waters is prohibited.

For the combined permit, the requirements for conservation practices to control nutrient loss (the addition of waste to the waters of the state) in the final Ecology general permit are identical to those mandated by the EPA CAFO rule.

State-only permit

While the draft state only permit included 100-foot setbacks or 35-foot vegetative buffers, the final state only permit does not. This is in response to concerns expressed by stakeholders, and maintains the flexibility allowed under the law, while still preventing unpermitted discharges to state waters. In order to comply with Chapter 90.48 RCW, state only permittees must use technology, BMPs, or buffers of some type to ensure that there is no surface water discharge from their land application fields. Specific setbacks and buffers are not included in the permit. This represents no change from the baseline.

2.9 Manure, litter, process wastewater, and nutrient analysis

Combined permit

The final permit requires spring sampling of all nutrient sources as well as two additional samplings spaced throughout the application season to account for potential changes in nutrient concentration.

The EPA CAFO rule requires nutrient sources to be sampled once per year.

State-only permit

Chapter 90.64 RCW does not directly require that manure and soil sampling occur. The law requires a dairy to have a NMP that contains elements specified by a technical advisory committee³. One of the elements in the checklist is whether manure and soil sampling are required, by the NMP, and if testing procedures are required. The checklist does not specify the testing procedures for manure and soil sampling. However, Ecology chose to use the guidance documents currently in use⁴. Though the soil and manure sampling is not specified in the NMP, based on discussion with producers, industry representatives, and comments on the draft permits, the sampling based on the listed guidance documents should be considered the baseline for a dairy operation under RCW 90.64 only.

³ Available on the Washington State Dairy Association's Website at: <http://agr.wa.gov/foodanimal/livestock-nutrient/dairynutrientmgmtplans.aspx>

⁴ Bary, A., Cogger, C., Sullivan, D. (2000). *Fertilizing with Manure*. Pacific Northwest Extension, WSU Food and Farm Connections Team; Moore, A., de Haro-Marti, M., Chen, L. (2015). *Sampling Dairy Manure and Compost for Nutrient Analysis*. Pacific Northwest Extension, University of Idaho; Staben, M. L., et. al. (2003). *Monitoring Soil Nutrients Using a Management Unit Approach*. Pacific Northwest Extension. Pub. No. PNW 570E; Sullivan, D., Cogger, C. (2003). *Post-Harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades*. Oregon State University Extension Service. Pub. No. EM 8832E.

2.9.1 Comparison to Idaho permit baseline

Compared to Idaho's general permit, Ecology's final general permit requires CAFOs to:

- Provide a greater number of analyses on each sample.
- Take samples more frequently.

2.9.2 Comparison to no federal mandate baseline

In comparison with the federal rule, Ecology's final permit requires a full set of analyses (four tests) for all nutrient sources a total of three times per year. We therefore assume that in the absence of Ecology's final general permit, permittees would not need any sampling.

2.10 Soil sampling and nutrient analysis

Combined permit

The EPA CAFO rule does not provide specific guidance on manure, litter, process wastewater, and soil sampling.

State-only permit

As discussed above, the sampling based on the listed guidance documents should be considered the baseline for a dairy operation under RCW 90.64 only.

In general, soil sampling that are part of NMPs is limited to a single representative 0-12 inch soil depth sample per crop field in the fall after harvest. Some operations may voluntarily have more sampling done. Sample analysis is done for total nitrogen (which is nitrate+nitrite, organic nitrogen, and ammonia/ammonium), but it is not required that analysis be done by an accredited lab as it is in the CAFO permit.

In comparison with Idaho's CAFO general permit, Ecology's final general permit specifies CAFOs must sample at one to three different depths⁵ twice per year:

1. Once, before the first application of manure, litter, or process wastewater onto fields.
2. After the harvest of crops.

This results in a total of two to six samples per year. Samples must be representative of the fields being sampled. Therefore, the number of required samples varies substantially depending on the characteristics of the fields in question.

Idaho's general permit requires permittees to sample once a year.

⁵ Areas with 25 inches or less of annual precipitation are required to sample at 0-12 inches and at 12-24 inches. In some cases, they may need to take an additional sample at 25-36 inches. Areas with more than 25 inches of precipitation are required to sample at 0-12 inches.

Ecology's draft general permit required all samples to be analyzed for:

- Nitrate + Nitrite.
- Ammonia/Ammonium N.
- Phosphorus.
- Organic Nitrogen.

However, Ecology's final general permit specifies the CAFO must analyze samples for:

- Nitrate + Nitrite.
- Ammonia/Ammonium N.

Additionally, every three years, the fall sample must include:

- Phosphorus.
- Organic Nitrogen.

The final draft permit requirements correspond to requirements by the WSDA Dairy Nutrient Management Program.

Idaho's general permit only requires the CAFO to sample for

- Nitrogen.
- Phosphorus.

2.10.1 Comparison to Idaho permit baseline

Compared to Idaho's general permit, Ecology's final general permit requires CAFOs to:

- Provide a greater number of analyses on each sample.
- Take samples more frequently.

2.10.2 Comparison to no federal mandate baseline

In comparison with the federal rule, Ecology's final permit requires a full set of analyses (four tests) at one to three depths, twice a year, for eight to twenty-four analyses total per year for each sampling location. We therefore assume that in the absence of Ecology's final general permit, permittees would not need any sampling.

2.11 Protocols for the land application of waste

The EPA CAFO rule requires Ecology to develop technical standards for the land application of waste, but does not provide specific guidance on how. Ecology's final general permit also prohibits waste application to:

- Fields that do not have crops on them or that are not being prepped for crops.
- Fields where the P-Index (phosphorus level) rating is high or excessive.
- Field buffers and setbacks.

Chapter 90.64 RCW has a number of requirements for land application. Ecology discussions with industry representatives indicate that they are currently applying at agronomic rates and that there is adequate storage to accommodate the amount of manure, litter, and process wastewater generated.

2.12 Record keeping

For the combined permit, the federal CAFO rule (40 CFR 122.42(e)(4) and 40 CFR 122.41) requires permittees prepare and submit an annual report that provides the field budget (the part of the NMP that budgets nutrients for specific fields) for the next year, as well as non-compliance notification. The conditions for terminating coverage under the general permit is mandated by federal rule 40 CFR 122.22, 122.64, and state rule WAC 173-226-240.

For the state-only permit, Chapter 90.64 RCW and WAC 16-611-020 have a number of requirements for record keeping, including:

- Soil and manure tests
- Application of the solid and liquid components of the manure
- Cropping
- Other significant factors and practices

Appendix A shows a comparison of current record keeping requirements with permit requirements. These requirements show significant overlap.

While conducting visual inspections of clean and wastewater lines is required, documenting the inspections is not currently required. This documentation is required under the final permit. Ecology will provide a template for recording these inspections. Costs will be minimal, as the inspections are already occurring.⁶

Similarly, while collecting and retaining relevant information is required under Chapter 90.64 RCW, annually reporting that information is not required. This reporting is required under the final permit. Costs should be minimal, as the information should be readily available.

⁶ If no irregularity occurs, documentation would entail checking a box indicating such. If an irregularity occurs, documentation would entail detailing said irregularity.

2.13 One-time lagoon inspection

The draft permit required a one-time lagoon inspection be conducted and reported. This report was required to be certified by an engineer and contained information on design and construction, structure site characteristics, and operation and maintenance.

The final permit requires the use of Washington Natural Resource Conservation Service (NRCS) Engineering Technical Note 23 for lagoon assessment. This is an assessment document produced by the NRCS for assessing the current state of lagoons to determine how much of a risk the lagoon poses to the environment. Currently, the Washington State Department of Agriculture (WSDA) conducts this assessment during their regular assessments of dairies, which occur every 18 – 22 months. This results in no added costs for permittees due to the general permit.⁷

2.14 Manure pollution prevention plan

The final permit requires development and implementation of a MPPP. Currently, all dairy producers have a NMP in place and are implementing those plans. The requirements of these plans closely align; therefore, many of the elements required by the MPPP are already developed. A Permittee would be able to copy the necessary information directly, thereby greatly reducing the time cost of MPPP development. Appendix B contains a comparison of the requirements for a NMP and a MPPP.

If the permittee does not have a NMP, it will absorb the entire cost of creating a MPPP.

2.15 Planning and implementation of repairs for high-risk lagoons

If a lagoon is assessed at Levels 3A, 3B, 3C, or 4, NRCS recommends discontinued use until repairs can be made. In these cases, the permit requires that the permittee develop a plan to address the deficiency within six months and begin implementing the plan within 18 months.

Industry representatives have indicated, during meetings discussing the CAFO permit, that their producer's lagoons are in good shape. In addition, as the NRCS lagoon assessment has been available for several years as part of receiving cost-share money from NRCS, a producer must complete the NRCS lagoon assessment and address deficiencies in the lagoon prior to NRCS providing funding.

Depending on which risk category a lagoon is assessed, the creation and implementation of a repair plan could range from minor effort and cost, up to and including replacement of the lagoon.

⁷ If a non-dairy CAFO had lagoons, inspection cost is estimated at \$460 per lagoon based on 8 hours per inspection including two site visits.

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Chapter 3 Overview of Analysis

This Economic Impact Analysis (EIA) estimates the costs of complying with the final CAFO general permit. It also compares the costs of complying with the final CAFO general permit for small businesses, to the costs of compliance for large businesses, to determine whether the requirements of the final CAFO general permit disproportionately impacts small businesses.

The scope of the analysis deals only with the direct compliance costs imposed by the final CAFO general permit to the CAFO industry. The EIA is not required to evaluate benefits of the general permit, or the costs and benefits of not having a general permit.

3.1 Small and large businesses

RCW 19.85.020(4) defines a small business as any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees. There are both small and large businesses in the CAFO industry. Overall, CAFOs average 7.9 employees. Among the small CAFOs, the average is 6.8 employees, and the large CAFOs average 79 employees.⁸

Ecology must compare the cost of compliance for small businesses with the cost of compliance for the 10 percent of CAFOs that are the largest businesses required to comply.

This analysis is based on dairy CAFOs, as they represent the vast majority of covered businesses.

We note that while small businesses as defined in WAC 19.85.020 refer to businesses with 50 or fewer employees, the size definitions of CAFOs for all available cost data are based on the number of animals in the operation⁹. Therefore, a business that meets the definition of a “small business” may be a large CAFO, and incur the costs of a large CAFO.

Below we proportion out currently permitted CAFOs by CAFO size, delineated by the number of animals at each CAFO. The definitions of CAFO size based on type of animal can be found in the Cost Methodology document for the 2002 EPA Guidelines for CAFOs¹⁰. The cost data used

⁸ We note that we have defined our demarcation at fewer than fifty employees (according to the general permit rule), while the definition of “small business” is inclusive of fifty employees (fifty or fewer). Our definition is different than the definition of “small business” in rule (fifty or fewer) due to data limitations - the Washington State Employment Security Department (WSESD) data is only defined by employment size categories, such as firms with 50-99 employees and firms with 20-49 employees. We therefore cannot tell how many firms in the category 50-99 have exactly fifty employees, and how many have more than fifty. Because of these data limitations, if any of our currently permitted firms have exactly fifty employees, we will have mistakenly categorized them as a “large business” when they should in fact be a “small business”.

⁹ United States Environmental Protection Agency (2002) Cost Methodology for the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations

¹⁰ EPA, *ibid*.

in Chapter 4 are all for the Pacific region, found in the 2002 Cost Methodology, averaged between Veal, Dairy, Beef, and Heifer CAFOs.

Table 2: CAFO size by number of dairy animals

CAFO Size	Number of animals	Number of dairies
Small	<200	102
Medium 1	200 - 349	60
Medium 2	350 - 524	58
Medium 3	525 - 699	45
Large	700 +	140

If a CAFO has less than 200 mature dairy animals, it is not required to apply for a permit unless Ecology determines that it is a significant contributor of pollutants and requires that the CAFO apply for a permit (through a formal, appealable process). Other animal types have different animal number thresholds based on 40 CFR § 122.23(b) below which the CAFO is not required to apply for a permit unless Ecology determines that it is a significant contributor of pollutants.

3.2 Compliance costs included in the EIA

According to WAC 173-226-120, the EIA must estimate the costs of the following:

- Minimum treatment technology
- Monitoring
- Reporting
- Recordkeeping
- Plan submittal
- Equipment
- Supplies
- Labor
- Administrative costs

3.3 Compliance costs excluded from the EIA

The cost of complying with the following laws and rules as they relate to complying with general permit conditions are not included in the EIA's analysis of compliance costs:

1. Dairy Nutrient Management Act (RCW 90.64)
2. State Groundwater Quality Standards (WAC 173-200)
3. State Surface Water Quality Standards (WAC 173-201)

4. State Sediment Management Standards (WAC 173-204)

5. Federal law and rules, in particular the Clean Water Act and federal NPDES rules.

The justification for excluding compliance costs related to these laws and rules is that permit holders cannot be exempt from these laws through the permit process and, therefore, any cost impacts of these laws and rules cannot be mitigated. Permit holders must comply with existing rules independent of permit requirements.

RCW 90.64 applies to dairies only and would not be applicable to other types of CAFOs.

3.4 State and federal water pollution rules

The federal Clean Water Act (CWA) requires those that discharge to surface waters obtain a National Pollutant Discharge Elimination System (NPDES) permit. NPDES rules establish technology-based effluent standards. At a minimum, Ecology's CAFO NPDES general permit must impose a level of pollution control that is at least as strict as that set by federal laws and rules.

In addition, all permits issued by Ecology must ensure dischargers do not violate the state:

- Water quality standards for surface waters of the state (WAC 173-201A)
- Water quality standards for ground waters of the state (WAC 173-200)
- Sediment management standards (WAC 173-204)

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Chapter 4 Estimated Costs of Compliance with the General Permit

The costs for CAFOs to comply with Ecology's CAFO general permit depend somewhat on the number of acres the CAFO encompasses due to sampling requirements. The number of animals is usually proportional to the acreage. While it seems appropriate to assume that CAFOs with less acreage will be those with fewer employees, this is not always the case. In this chapter, Ecology estimated ranges of costs for most requirements based on the size of the CAFO in terms of the number of animals. We only give estimates for Medium 1, Medium 2, Medium 3, and Large CAFOs because CAFOs with less than a threshold number of animals (Small CAFOs based on EPA rule definition in 40 CFR § 122.23(b)) are not required to apply for a permit unless Ecology determines they are a significant contributor of pollutants¹¹.

4.1 Manure, litter, process wastewater, and nutrient analysis

The EPA CAFO rule does not provide specific guidance on nutrient source sampling. In comparison with Idaho's CAFO general permit, Ecology's final general permit specifies CAFOs must sample sources a total of three times annually:

1. Once in the spring.
2. Twice spaced throughout the application season.

Idaho's general permit requires permittees to sample once a year.

Ecology's general permit specifies the CAFO must sample for:

- Nitrate + Nitrite.
- Organic Nitrogen.
- Ammonia/Ammonium N.
- Phosphorus.

EPA's Idaho general permit only requires the CAFO to sample for:

- Nitrogen.
- Phosphorus.

Ecology's general permit requires CAFOs to sample more frequently compared to the EPA Idaho general permit. It also requires more analyses (4) be done for each sample than the EPA Idaho permit (2).

¹¹ Cost estimates for Small CAFOs are not available. Estimates for Medium 1 CAFOs may be used to conservatively estimate the upper bound for Small CAFO costs.

From the 2002 EPA Cost Methodology¹² we find a one-time capital cost for soil sampling to be \$55 (to purchase sampling equipment)¹³. There is also an average cost of \$25 per sample¹⁴ based on a survey of costs by state Natural Resource Conservation Service (NRCS) laboratories.

The Ecology general permit requires two more samples and ten more analyses than the Idaho general permit.

Table 3: Comparison of permit requirements and baseline

	Samples Per Year	Analyses Per Year
Idaho general permit	1	2
Ecology general permit	3	12
Increase	2	10

In comparison to a baseline of no federal mandate, as the CAFO rule does not provide specifics, the cost of all three samples and 12 total analyses per year is attributed to Ecology discretion. CAFOs average roughly 3 nutrient sources.

The total five-year present value cost per CAFO per nutrient source is:

- \$756 compared to the Idaho general permit.
- \$1,154 compared to no federal mandate.

These are costs over 5 years, using a 1.12 percent discount rate¹⁵.

4.2 Soil sampling

The EPA CAFO rule does not provide specific guidance on waste and soil sampling. In comparison with Idaho’s CAFO general permit, Ecology’s general permit specifies CAFOs must sample soil at one to three different depths twice per year:

1. Before applying waste onto fields.
2. After the harvest of crops.

¹² United States Environmental Protection Agency (2002) Cost Methodology for the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations

¹³ This equipment is for both manure and soil sampling.

¹⁴ This is the average cost of manure and soil sampling.

¹⁵ US Treasury Department (2016). Historic average real rate of return on US Treasury Department I-Bonds. Associated historic average inflation rate is approximately 2 percent.

Idaho’s general permit requires permittees to sample once a year.

Ecology’s final general permit specifies the CAFO must sample for:

- Nitrate + Nitrite.
- Ammonia/Ammonium N.

Additionally, every three years, the fall sample must include:

- Phosphorus.
- Organic Nitrogen.

EPA’s Idaho general permit only requires the CAFO to sample for

- Nitrogen.
- Phosphorus.

Ecology’s general permit requires CAFOs to both provide a greater number of samples, as well as sample more frequently compared to the EPA Idaho general permit. It also requires more analyses (four) be done for each sample than the EPA Idaho permit (two).

From the 2002 EPA Cost Methodology we find a one-time capital cost for soil sampling to be \$55 (to purchase sampling equipment)¹⁶. There is also an average cost of \$25 per sample¹⁷ based on a survey of costs by state Natural Resource Conservation Service (NRCS) laboratories.

Sampling must be representative of the field(s) which will receive the manure. The number of samples required is directly related to the size and landscape of the area being sampled. Currently, an average of 12.7 fields per farm are sampled.¹⁸ Relative to the Idaho general permit, Permittees in Washington State must gather 25 to 75 samples total per year and perform a total of 50 – 150 analyses on these samples, as opposed to 13 samples per year under the Idaho general permit with a total of 25 analyses performed on these samples. The Ecology general permit therefore requires 12 to 62 additional samples and 25 – 88 additional analyses compared to the Idaho general permit. Additionally, every three years, an additional 50-150 analyses must be performed for Washington permittees.

Table 4: Comparison of permit requirements and baseline

	Samples per year	Analyses per year
Idaho general permit	13	25
Ecology general permit	25 - 75	50 - 150
Increase	12 - 62	25 - 125

¹⁶ This equipment is for both manure and soil sampling.

¹⁷ This is the average cost of manure and soil sampling.

¹⁸ Email correspondence with Fred Likkel July 5, 2016.

In comparison to a baseline of no federal mandate, as the CAFO rule does not provide specifics, the cost of all 25 to 75 samples per year is attributed to Ecology discretion, as are the additional 50-150 analyses every three years.

The cost per CAFO compared to the Idaho general permit is \$1,565 to \$7,675, and the cost per CAFO compared to no federal mandate ranges from \$3,150 to \$9,250. These are costs over 5 years, using a 1.12-percent discount rate¹⁹.

4.3 Permit Fees

Permit fees vary by type of CAFO and the number of animal units served by the CAFO. Table 5 summarizes the fee schedule.

Table 5: Permit Fees²⁰

Category	Year	
	FY 2016	FY 2017
Non-Dairy CAFO		
<200 animal units	\$236	\$248
200 - <400 animal units	\$592	\$623
400 - <600 animal units	\$1,186	\$1,248
600 - <800 animal units	\$1,777	\$1,871
800 animal units and up	\$2,373	\$2,498
Dairies - \$0.50 per animal unit subject to listed maximums	\$1,586	\$1,670

4.4 Manure pollution prevention plan

The cost of creating a MPPP will vary with the amount of pre-existing information for the CAFO. CAFOs with a current NMP will have already completed many of the requirements for the MPPP, as these plans carry many similar requirements.²¹ However, if a CAFO does not have a pre-existing NMP, the entire cost of preparing the MPPP will be attributable to the permit.

Using the 2002 EPA Cost Methodology²², preparation of a NMP can range from \$4,100 to \$9,800. As the plans are very similar in scope, Ecology used a range of \$0 to \$9,800 as the estimated cost of preparing a MPPP, depending on how much information the CAFO has already prepared.

4.5 Lagoon assessment, planning and repair

Conducting the one-time lagoon assessment is currently being done by the WSDA for dairies. If a covered CAFO is not a dairy, or if the WDA is unable to continue conducting the assessments, the CAFO would incur the cost of assessment. These costs are estimated to be roughly \$460 per

¹⁹ US Treasury Department (2016). Historic average real rate of return on US Treasury Department I-Bonds. Associated historic average inflation rate is approximately 2 percent.

²⁰ Animal units are defined in WAC 173-224-030.

²¹ Appendix B contains detailed information on which portions of the MPPP and NMP overlap.

²² Ibid.

lagoon, including 8 hours of staff time for an agricultural assessor. CAFOs average three lagoons each, for a total cost of \$1,380.

At this time Ecology does not have data on how many lagoons will rate risk category 3 or 4 and therefore need to have deficiencies addressed. WSDA is currently gathering data based on their use of the NRCS assessment on Yakima County dairy lagoons. However, the risk category data will not be available to Ecology for some time. Therefore, to update cost assessment, Ecology is conservatively assuming that 25% of lagoons will need some work based on the NRCS assessment result of risk category 3 or 4. However, based on discussions with industry representatives indicating that their producer’s lagoons are in good shape, as well as the assessment being used in order to receive NRCS cost-share funding, Ecology believes that the actual number of lagoons that will need work based on the NRCS assessment is going to be much lower.

Depending on which risk category a lagoon is assessed, the creation and implementation of a repair plan could range from minor repairs, which would include minor effort and cost, up to and including replacement of the lagoon.

Using the 2002 EPA Cost Methodology²³, replacement of a lagoon can range from \$42,000 to \$450,000. Minor repairs could be as low as a few hundred dollars.

The average expected cost to permittees using the conservative estimates of three lagoons per CAFO, and 25% of lagoons needing at least some work based on the NRCS assessment ranges from a few hundred dollars to \$30,000 - \$337,000.

4.6 Overall compliance costs

This EIA compares the quantified costs of compliance for small and large businesses to determine if the general permit disproportionately impacts small businesses. Ecology compares costs by looking at the cost per employee, where businesses with fewer than 50 employees are considered small businesses. Table 6 summarizes the estimated compliance costs per CAFO.

Table 6: Summary of estimated compliance costs per CAFO

Baseline for Comparison (2016\$)	State Only	Combined
Manure, litter, process wastewater, and nutrient analysis	\$756	\$1,154
Soil Sampling		
Low	\$1,565	\$3,150
High	\$7,675	\$9,250
Permit Fees	\$2,445	\$9,056
Manure pollution prevention plan		
Low	\$0	\$0
High	\$9,800	\$9,800

²³ *ibid.*

Lagoon assessment, planning and repair		
Low	\$0	\$0
High	\$338,500	\$338,500

These costs represent an average number of samplings per site, and average permit fees²⁴. Low estimates indicate fewer additional samples were needed. High estimates indicate more additional samples were needed. As discussed above, some of these costs may not apply to a specific permittee. These are costs over five years, using a 1.12-percent discount rate²⁵.

²⁴ The permit fee for non-dairy CAFOs was used for the combined permit, using 700 animal units to estimate permit fees, as dairies, which use lagoons, would fall under the state-only permit, while non-dairies would likely fall under the combined permit. The permit fee for dairy CAFOs was used for the state only permit. The state-wide average of roughly 1,000 cows per dairy was used to approximate permit fees, with the understanding that one animal unit is not equivalent to one cow. Fees for FY 2018 and beyond were assumed to remain at FY 2017 levels.

²⁵ US Treasury Department (2016). Historic average real rate of return on US Treasury Department I-Bonds. Associated historic average inflation rate is approximately 2 percent.

Chapter 5 Proportionality and Mitigation

5.1 Comparison of compliance costs for large and small businesses

The purpose of the EIA is to provide a comparison of the cost of compliance for small businesses and large businesses.

There are both small and large businesses in the CAFO industry. Small businesses average 6.8 employees, and large businesses average 79 employees. Table 7 and Table 8, below, shows the cost per employee for small and large businesses under each baseline.

Table 7: Cost per employee for small businesses

Small Business cost per employee	State Only	Combined
Manure, litter, process wastewater, and nutrient analysis	\$111	\$170
Soil Sampling		
Low	\$230	\$463
High	\$1,129	\$1,360
Permit Fees	\$360	\$1,332
Manure pollution prevention plan		
Low	\$0	\$0
High	\$1,441	\$1,441
Lagoon assessment, planning and repair		
Low	\$0	\$0
High	\$49,779	\$49,779

Table 8: Cost per employee for small businesses

Large Business Cost per employee	State Only	Combined
Manure, litter, process wastewater, and nutrient analysis	\$9.57	\$14.61
Soil Sampling		
Low	\$19.81	\$39.87
High	\$97.15	\$117.09
Permit Fees	\$30.95	\$114.63
Manure pollution prevention plan		
Low	\$0.00	\$0.00
High	\$124.05	\$124.05
Lagoon assessment, planning and repair		
Low	\$0.00	\$0.00
High	\$4,284.81	\$4,284.81

While there is likely correlation between the size of a CAFO in terms of employees and acres it encompasses, it is unclear whether this would mean larger CAFOs needing to take more samples, as sampling requirements depend on the specific lands being sampled. However, given that large businesses in this industry have more than ten times the number of employees that small businesses do, and greater costs due to increased sampling are unlikely to be ten times larger, this cost would still be disproportionate.

There is also likely correlation in the number of animals serviced and the number of employees, however this is not universal. More animals serviced would lead to larger permit fees, however, as the fees are capped, fees for large businesses would be significantly less than ten times greater than those for small businesses.

There may be correlation in the size of a CAFO in terms of employees and the size of lagoon used (replacement or repair of larger lagoons are costlier). However, a CAFO may use more, smaller lagoons as opposed to fewer, larger lagoons. In either case, given that large businesses in this industry have more than ten times the number of employees that small businesses do, and greater costs due to lagoon repair/replacement are unlikely to be ten times larger, this cost would still be disproportionate.

It is likely that the costs of complying with the permit disproportionately burden small businesses. Ecology is therefore required to mitigate this disproportionate impact to the extent it is legal and feasible.

5.2 Mitigation

The general permit rule (WAC 173-226-120) requires that disproportionate economic impacts of general permits on small businesses be reduced, when it is both legal and feasible to do so.

Legality and feasibility are determined by the legal context of existing state and federal rules, such as the State Water Pollution Control Act (Chapter 90.48 RCW) and the federal Clean Water Act. Cost impacts on small businesses are reduced by modifying the conditions of the permit.

Mitigation involves one or more of the following:

- Establishing differing compliance or reporting requirements or timetables for small businesses.
- Clarifying, consolidating, or simplifying the compliance and reporting requirements under the general permit for small businesses.
- Establishing performance rather than design standards.
- Exempting small businesses from parts of the general permit

Ecology could not phase in additional requirements for small business, because they are intended to help CAFOs meet legal requirements that protect the state's surface and ground waters from unpermitted discharges and contamination (RCW 90.48, Chapter 173-201A WAC, Chapter 173-200 WAC).

Small businesses, if business size is correlated with CAFO size, inherently have lower reporting requirements, in that they have smaller degrees of sampling and inspection.

By removing a previously proposed specific setback/buffer, Ecology has retained the flexibility in the authorizing statutes (citation) to use best practices and appropriate technologies to achieve the performance of preventing discharge of pollutants to state waters.

To mitigate the burden on the smallest businesses (small CAFOs), Ecology has included a lower threshold of animal numbers below which a CAFO does not have to apply for a permit unless Ecology determines the small CAFO is a significant contributor of pollutants. The lower threshold of animal numbers depends on the type of animals and is pulled from the federal CAFO rule (40 CFR § 122.23(b)). For example, the lower threshold for mature dairy cows is less than 200 cows while the lower threshold for chickens is less than 37,500 laying hens.

References

RCW 34.05.272 directs agencies taking significant actions in the Water Quality Program to categorize citations as follows in bold headings, with citations for this analysis categorized into each section.

(i) Independent peer review: Review is overseen by an independent third party;

Bary, A., Cogger, C., Sullivan, D. (2000). *Fertilizing with Manure*. Pacific Northwest Extension, WSU Food and Farm Connections Team.

Moore, A., de Haro-Marti, M., Chen, L. (2015). *Sampling Dairy Manure and Compost for Nutrient Analysis*. Pacific Northwest Extension, University of Idaho.

Staben, M. L., et. al. (2003). *Monitoring Soil Nutrients Using a Management Unit Approach*. Pacific Northwest Extension. Pub. No. PNW 570E.

Sullivan, D., Cogger, C. (2003). *Post-Harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades*. Oregon State University Extension Service. Pub. No. EM 8832E.

(ii) Internal peer review: Review by staff internal to the department of ecology;

(iii) External peer review: Review by persons that are external to and selected by the department of ecology;

(iv) Open review: Documented open public review process that is not limited to invited organizations or individuals;

WA Department of Ecology (2011). Water quality program permit Writer's Manual. Publication no. 92-109.

United States Environmental Protection Agency (2002) Cost Methodology for the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations

(v) Legal and policy document: Documents related to the legal framework for the significant agency action including but not limited to:

(A) Federal and state statutes;

(B) Court and hearings board decisions;

(n/a)

(C) Federal and state administrative rules and regulations; and

(D) Policy and regulatory documents adopted by local governments;

(vi) Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under the processes described in (c)(i), (ii), (iii), and (iv) of this subsection;

U.S. Census Bureau (2014). North American Industry Classification System.
<http://www.census.gov/eos/www/naics/>

U.S. Department of Commerce: Bureau of Economic Analysis (2016). Gross National Product: Implicit Price Deflator. <http://research.stlouisfed.org/fred2/data/GNPDEF.txt>

U.S. Treasury (2016): Historical I-bond Rates: <https://www.treasury.gov/resource-center/data-chart-center/Pages/index.aspx>

(vii) Records of the best professional judgment of department of ecology employees or other individuals; or

(n/a)

(viii) Other: Sources of information that do not fit into one of the categories identified in this subsection (1)(c).

(n/a)

Appendix A: Comparison of Current Reporting Requirements and Permit Requirements

Reporting Requirements	
Current Requirements (WAC 16-611-020)	Permit Requirements
(1) In accordance with RCW 90.64.010 (17)(c) and 90.64.102, dairy producers must maintain records to demonstrate that applications of nutrients to crop land are within acceptable agronomic rates.	
(2) Dairy producers must maintain the following records to demonstrate that applications of nutrients to the land were within acceptable agronomic rates:	
(a) Soil analysis.	
(i) Annual postharvest soil nitrate nitrogen analysis;	
(ii) Every three years, a current soil analysis that includes:	
(A) Organic matter;	
(B) pH;	
(C) Ammonium nitrogen;	
(D) Phosphorus;	
(E) Potassium; and	
(F) A measure of electrical conductivity.	
(b) Nutrient analysis for all sources of organic and inorganic nutrients including, but not limited to, manure and commercial fertilizer supplied for crop uptake. Manure and other organic sources of nutrients must be analyzed annually for organic nitrogen, ammonia nitrogen, and phosphorus.	S6A - The Permittee must keep records showing 3 years of consistent nutrient analysis from each separate nutrient source (e.g. lagoon) on-site that the Permittee uses for land application.
(c) Application records must include:	
(i) Field identification and year of application;	S6.B.1.b. The field to which the source(s) of nutrients were applied.
(ii) Crop grown in each field where the application occurred;	
(iii) Crop nutrient needs based on expected crop yield;	
(iv) Nutrient sources available from residual soil nitrogen including contributions from soil organic matter, previous legume crop, and previous organic nutrients applied;	

Reporting Requirements

Current Requirements (WAC 16-611-020)	Permit Requirements
(v) Date of applications, method of application, nutrient sources, nutrient analysis, amount of nitrogen and phosphorus applied and available for each source;	S6.B 1. - a. Dates manure, litter, process wastewater, or other source of nutrients were applied to each field; c. Method of land application; d. Amount of nutrients applied in gallons, tons, or ft ³ or for commercial/chemical fertilizer lbs/acre.
(vi) Total amount of nitrogen and phosphorus applied to each field each year; and	S6.B 1. - e. The total nitrogen applied; f. Total phosphorus applied.
(vii) Weather conditions twenty-four hours prior to and at time of application.	S6.B 1. - g. Weather 24 hours before land application; h. Weather during land application.
(d) Manure transfer records, including imports or exports. Records must include:	
(i) Date of manure transfer;	S6.C.4. Date export took place.
(ii) Amount of nutrients transferred;	S6.C.1. Amount of manure, litter, or process wastewater exported in gallons for liquid/slurry and tons for solids.
(iii) The name of the person supplying and receiving the nutrients;	S6.C.2. Name of entity manure was exported to.
(iv) Nutrient analysis of manure transferred.	
(e) Irrigation water management records. Records must include:	
(i) Field identification;	
(ii) Total amount of irrigation water applied to each field each year.	S6.B.1.j. Total amount of irrigation water applied to each field each year.
	S6.A Operations and Maintenance - The Permittee must record the outcome of the visual inspections/monitoring required by special condition S5.A. Ecology provides a template for this record keeping
	S6.B.1.i. Weather 24 hours after land application.
	S6.B.2. Upon determination that a high fall soil nitrate test is due to crop failure or other unusual environmental conditions the Permittee must keep records of how the determination was made, including any data, measurements, or best professional judgment by technical assistance providers
	S6.C.3. Assessor's parcel number(s) and acreages of the fields where the exported manure will be applied unless being exported to a manure broker (or similar).

Appendix B: Comparison of Nutrient Management Plan and Manure Pollution Prevention Plan

While the requirements for a MPPP are identified in a sequential, numbered order in the permit, the requirements for a NMP are not identified in the same manner. For this reason, the following table illustrates the requirements for a MPPP and whether it is included in the requirements for a NMP.

Components of MPPP	Included in NMP
S4.R - 1: Must describe how Permittee is meeting the following Performance Objectives	
S4.A. Production Area Run-off Controls	Yes
S4.B. Manure, Litter, Process Wastewater, and Feed Storage	Yes
S4.C. Other Above and Below Ground Infrastructure	Yes
S4.D. Diversion of Clean Water	Yes
S4.E. Prevent Direct Animal Contact with Water	
S4.F. Chemical Handling	Yes
S4.G. Livestock Mortality Management	Yes
S4.H. Manure, Litter, and Process Wastewater Sampling and Nutrient Analysis	Yes
S4.I. Soil Sampling and Nutrient Analysis	Yes
S4.J. Land Application	Yes
S4.K. Adaptive Management for Areas with ≤ 25 Inches Precipitation	
S4.L. Adaptive Management for Areas with > 25 Inches Precipitation	
S4.M. Irrigation Water Management	Yes
S4.N. Field Discharge Prevention	
S4.O. Manure Export	Yes
S4.P. Emergency Procedures	Yes
S4.Q. Training	Yes
S4.R - 2: Drawings and Maps	
a. Map and/or aerial photos of CAFO production area indicating the following:	
i. Liquid manure and process wastewater storage structures	Yes
ii. Solid wastewater storage structures	Yes
iii. Feed storage structures	Yes
iv. Known underground piping for liquid manure and process wastewater	
v. Electrical lines that control pumps or valves that if broken would result in uncontrolled flow of liquid manure or process wastewater	

Components of MPPP	Included in NMP
vi. Direction(s) that run-off or discharges will flow on the production area	
vii. Groundwater wells, noting their use	
b. Maps and/or aerial photos of their land application fields indicating the following:	
i. Unique field identification	Yes
ii. Field run-off prevention practice location, type, and width	
iii. Other areas that must not have manure, litter, or process wastewater applied to them because application to those areas would cause a discharge	
iv. Known tile drain outlets	
S4R - 3: Facility Information	
a. Information about existing site conditions	Yes
b. The maximum number of animals the current infrastructure was designed to house and maintain	Yes
c. Potential surface or groundwater discharge problem areas	Yes
d. If an element of special conditions S4.A-Q is not addressed on-site but needs to be to prevent pollution, the construction/implementation schedule for when the missing element will be addressed	
e. The actions to be taken if the performance goals in any special condition S4.A-Q are not achieved	
f. The storage capacity for all manure, litter, feed, and process wastewater storage structures intended for long-term storage	Yes
g. This does not include structures intended to only hold manure, litter, feed, or process wastewater on a temporary basis while pumping from one location to another or while processing the materials	N/A
h. For each storage structure include:	
i. Include the total designed storage volume	Yes
ii. Number of days of storage capacity as designed and as currently maintained.	Yes
iii. Design treatment volume (liquid storage structures only)	Yes
iv. Volume available for solids build-up (liquid storage structures only)	Yes
S4R - 4: Updates	
Whenever there is a change in design, construction, operation, or maintenance of the CAFO infrastructure that will affect how manure, litter, feed, or process wastewater will be managed on-site to prevent pollution	Yes