



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

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March 14, 2019

Oliver Tolksdorf
Harnett County Health Dept
307 Cornelius Harnett Blvd
Lillington, NC 27546

Subject: Ziad Qudwa slaughterhouse – proposed design daily flow
1253 Atkins Road, Fuquay Varina
Project Number: 2019-04 / IP-43-1901

Dear Mr. Tolksdorf:

On January 11, 2019, the OSWP Central office in Raleigh, North Carolina received one copy of specifications and plans for a wastewater system to serve a proposed slaughterhouse to be located at 1253 Atkins Road in Fuquay Varina, North Carolina developed by Gary S. MacConnell, PE (MacConnell & Associates, P.C.). This was accompanied by a copy of the “Local Health Department Request for Project Review” form requesting OSWP review the design plans and specifications. The design daily flow (DDF) for this type of business is not listed under 15A NCAC 18A .1949 Table No. I. The comparable or projected DDF and the wastewater characteristics (comparable or projected) must receive concurrence from OSWP prior to review of the design of the proposed wastewater treatment and dispersal system. Based on this, only information regarding the proposed DDF was reviewed. The site information, project design/calculations and project specifications were not reviewed.

The initial review of the proposed DDF of 1,270 gallons per day (gpd) is complete. Based on the information provided, at this time we cannot concur with that figure. Review comments are as follows:

General

1. The narrative of the “Technical Memorandum” consists of general statements about slaughterhouses based on USDA and NCDA&CS guidelines. The applicant’s consultant should provide project-specific details on how the information in the Technical Memorandum applies to halal abattoirs in general and this facility in particular.
2. Common slaughterhouse meat processing steps include holding areas, stunning, killing, bleeding, carcass dressing, hide removal, evisceration, carcass washing, boning, clean-up, sanitizing/disinfecting, and possibly casings and offal processing. Since halal abattoirs have very specific procedures and processes, common slaughterhouse operational descriptions may not apply to this facility. How does the proposed halal abattoir compare to a “common slaughterhouse” that the applicant’s consultant used as the principle

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basis for proposed DDF and projected wastewater effluent characteristics? The applicant's consultant should provide a detailed description of the processes for this halal abattoir (e.g., first processing, further processing, rendering), including what products and wastewater are expected to be discharged to the system during each step of the process and what products will be removed by other process controls.

Design Daily Flow & Wastewater Strength

3. The applicant's consultant is to submit supporting documentation to justify that the wastewater flow data and wastewater characteristics presented were from facilities comparable to that being proposed (common slaughterhouse vs. halal abattoir). The applicant's consultant should obtain effluent data (pH, temperature, wastewater constituents [BOD, coliform organisms, FOG, dissolved solids, total nitrogen, nitrate, etc.] and concentrations, daily wastewater flow volumes during normal to peak processing periods) from a comparable facility. It is OSWP's understanding that there are halal abattoirs currently operating in North Carolina.

Although the design of the dispersal field may be based on a week's total flow volume equalized over a defined time, the wastewater treatment components prior to flow equalization are to be based on the maximum daily design flow capable of being generated by the facility.

4. One determining factor in the amount of wastewater generated is the number and type of animals processed at the facility
 - a. What combination of animals can be processed in a single day that results in a peak water use day? Can two cows (veal) be slaughtered in a single day? Based on the information provided by the consultant in the project submittal package, the slaughter of a single cow (veal) weighing 2,400 pounds uses about 1,277 gallons of water alone and does not account for any other animals being slaughtered the same day, employee water usage, cleaning, or any other wastewater generated at the facility.
 - b. Table 2, "Estimated Slaughterhouse Operation" in the "Technical Memorandum" portion of the submittal should reflect the maximum number of animals to be slaughtered in a single day since treatment component capacities are to be based on peak daily flow, not weekly average.
 - c. Does the Daily Animal Kill column in Table 3 of "Technical Memorandum" portion of the consultant's submittal represent the maximum number of an animal type that can be slaughtered in a single day or does it represent the combined number of each type of animal that can be slaughtered in a single day? Does the owner of the halal abattoir agree with the proposed animal combination, both daily and weekly? Is there a maximum number of animals that can be processed in a single day and a week?
5. Table 3 of the "Wastewater Analysis" portion of the consultant's submittal appears to account for wastewater generated by animal processing and not for wastewater resulting from cleaning and sanitization. For example, how many projected gallons of wastewater will be generated from killing, defeathering, evisceration and washing of each chicken as opposed to the projected gallons of wastewater generated from preparation area, utensils and equipment cleaning? Provide information on the amount of water used for cleaning the facility per animal. The applicant's consultant should specify the maximum

number of animals that will be processed in a day for this facility, the origin of that number, and the maximum number of each type of animal that will be processed in a day for this facility.

It is also important to determine influent and effluent wastewater constituents and concentrations for this particular type of facility.

6. The applicant's consultant states that a solid interceptor "will greatly reduce concentrations of BOD, TSS, FOG and other pollutants from the wastewater". Have the applicant's consultant provide the documentation that supports that a solid interceptor will accomplish that claim for this particular facility generated wastewater.
7. Table 5 in the "Technical Memorandum" reflects only a portion of the information reported by the USEPA for their 1974 developmental document. The USEPA data was collected from 24 (or less) different facilities prior to 1974. The characteristics were calculated by dividing the average constituent concentrations by the average wastewater flow of the same facilities. Standard deviations for the calculated averages were also included. The proposed influent characteristics for this facility, which are based on the 1974 EPA data, do not account for the standard deviations. The standard deviations range from 50% to 105% of the average constituent influent concentrations. The consultant has not addressed the standard deviations and how they could impact the proposed influent concentration calculations.
8. Table 5 of the "Technical Memorandum" reflects wastewater characteristic data that was calculated by dividing the average constituent concentrations from 24 different facilities by the average wastewater flow of the same 24 facilities (USEPA, 1974). More recently published data is available in:
 - a. "Chapter 3 Treatment of Meat Wastes". Charles J. Banks and Zhengjian Wang. *Waste Treatment in the Food Processing Industry* (Published by CRC Press, Taylor & Francis Group, 2006).
 - b. Bustillo-Lecompte, C., Mehrvar, M. and Quiñones-Bolaños, E. (2016) Slaughterhouse Wastewater Characterization and Treatment: An Economic and Public Health Necessity of the Meat Processing Industry in Ontario, Canada. *Journal of Geoscience and Environment Protection*, 4, 175-186. <http://dx.doi.org/10.4236/gep.2016.44021>.
 - c. Bustillo-Lecompte, Ciro & Mehrvar, Mehrab. (2017). Slaughterhouse Wastewater: Treatment, Management, and Resource Recovery. 10.5772/65499.
 - d. Massé, D.I. and Masse, L. 2000. Characterization of wastewater from hog slaughterhouses in Eastern Canada and evaluation of their in-plant wastewater treatment systems. *Can. Agric. Eng.* 42:139-146. <https://www.semanticscholar.org/paper/Characterization-of-wastewater-from-hog-in-Eastern-Mass%C3%A9/856b7440a2e8b19a1ae6beecfae79a4588fa74e5>.
 - e. Mulu, Abrha & Ayenew, Tenalem. (2015). Characterization of Abattoir Wastewater and Evaluation of the Effectiveness of the Wastewater Treatment Systems in Luna and Kera Abattoirs in Central Ethiopia. *International Journal of Scientific and Engineering Research*. 6. 1026-1040.
9. For the proposed facility, what are the bacterial constituents and projected/estimated amounts that will be present in the influent and effluent wastewater?
10. Blood and bodily fluids are not to be directed to floor drains in holding, slaughter, and processing areas for discharge to a subsurface wastewater treatment and dispersal system. Any such fluids are to be directed to a container for holding prior to offsite disposal.

11. Per the Code of Federal Regulations (Title 9, Chapter III, Subchapter A, Part 303, Section 303.1), custom slaughterhouses are required to abide by sanitizing and cleaning requirements where:
 - a. Minimum temperatures of wash and rinse waters range from 75 °F to 170 °F depending on immersion times and chemicals used. Sanitizing temperatures depend on the methods used.
 - i. Manual sanitizing using hot water, $T \geq 170$ °F;
 - ii. Machine sanitizing using hot water, T ranges (wash 140 °F - 165 °F, final rinse 165 °F - 180 °F).
 - b. Cleaning solutions for sanitization of equipment and utensils contain at least 50 ppm of available chlorine as a hypochlorite, 12.5 ppm of available iodine having a $\text{pH} \leq 5.0$, other chemical sanitizing agent with the equivalent bactericidal effect as the concentration of chlorine (maximum chemical concentrations per 21 CFR 178.1010).

The applicant's consultant should provide the projected temperature and pH of the wastewater initially entering the treatment train since these can impact necessary treatment types and detention times to meet effluent discharge limitations. The applicant's consultant should also address the potential impacts of such temperatures and chemical concentrations on the wastewater effluent.

12. Some chemical disinfectants such as chlorine-containing compounds, aldehydes, quaternary ammonium compounds, and oxygen-releasing substances (peroxide compounds) are commonly recommended for use by systems discharging to municipal sewer, such chemicals may have an adverse impact on a subsurface wastewater system and therefore should be prohibited from discharging to a subsurface wastewater system. The applicant's consultant should specify the chemical disinfectants and cleaners that will be used at this facility and clearly specify which of these are to be introduced into the system.

Review of the proposed project will continue once we have received the additional information requested and the above stated issues have been addressed. If you have any questions concerning these comments, you may contact me by phone at (919) 707-5879, by fax at (919) 845-3972, or by e-mail at Lorna.Withrow@dhhs.nc.gov.

Sincerely,

Lorna C. Withrow, PE
On-Site Wastewater Engineering

cc: Scott Greene, LSS – OSWP Regional Soils Specialist