

**Ordinance no. \_\_\_\_\_**

**An ordinance of the City of Lansing, Michigan, to amend the Code of Ordinances of the City of Lansing by amending Chapter 1040, Sections 1040.01 and 1040.12 to update the ordinance to reflect stricter enforcement of fats, oils, and grease disposal and installation and maintenance of grease interceptors/traps.**

*CHAPTER 1040. SEWERS GENERALLY*

**1040.01. Definitions.**

As used in this chapter and in Chapters 1042 through 1046:

***Best management practices (BMPs)*** means methods or techniques found to be the most effective in achieving an objective such as preventing or minimizing pollution. In this chapter, BMPs refer to methods and techniques used by food service establishments and other facilities that may have an impact on the sewer system by the deposition of fats, oils, and grease, to prevent or minimize the deposition of fats, oils and grease from cooking, baking, processing, manufacturing and other processes in private sewer laterals and public sewer lines, structures and wastewater treatment facilities.

*Billing and collection charge* means that portion of the user charge for billing for a collection service.

*BOD or biochemical oxygen demand* means the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at twenty degrees Centigrade, expressed in parts per million by weight.

*Building drain* means that portion of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste and other drain pipes inside the walls of the building and conveys it to the building sewer.

*Building sewer* means the sewer that connects the building drain to a public sewer or other place of disposal and conveys the sewage of one building.

***City*** means the City of Lansing.

*Combined sewer* means a sewer receiving both surface run-off and sanitary sewage.

*Debt service charge* means that portion of the user charge for capital cost retirement.

*Dwelling unit* means any building or portion thereof containing as a unit living facilities which include provisions for sleeping, eating, cooking and sanitation as required by the Lansing Housing Code, as amended.

***Fats, oils, and grease (FOG)*** means any hydrocarbons, fatty acids, soaps, fats, waxes and any other nonvolatile material of animal, vegetable or mineral origin that is extractable by solvent in accordance with standard methods.

***Food service establishments (FSEs)*** means those establishments engaged in the activity of preparing, serving or otherwise making food available for consumption by the public, which use one or more of the following preparation methods: cooking by frying (all methods), baking (all methods), grilling, sautéing, rotisserie cooking, broiling (all methods), boiling, blanching, roasting, toasting, infrared heating, searing, barbecuing and any other method of food preparation that produces or may produce hot, nondrinkable food product in or on a receptacle that requires washing. These establishments include, but are not limited to, restaurants, bakeries, commercial kitchens, caterers and food trucks.

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*Garbage* means solid wastes from the preparation, cooking and dispensing of food or from the handling, storage, processing and sale of produce.

***Grease interceptor/trap*** means a device to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, bars, cafeterias and the like, and is also described as a device for separating and retaining waterborne greases and grease complexes prior to wastewater exiting the device and entering the sanitary sewer collection system. A grease interceptor is commonly associated with kitchen cleaning appliances such as sinks, woks and any other drains that collect oil and/or grease so as to prevent unreasonable accumulations of oil and/or grease from infiltrating into the sanitary sewer system and otherwise prohibiting the free flow of wastewater within such system.

*Health Department* means the official Department of Health of the County.

*Mg/l* means milligrams per liter.

*Natural outlet* means any watercourse, pond, ditch, lake or other body of water, either surface or ground.

*Operation and maintenance* means all work, materials, equipment, utilities and other effort required to operate and maintain wastewater transportation and treatment systems consistent with ensuring adequate treatment of wastewater to produce an effluent in compliance with the NPDES permit and other applicable State and Federal regulations, and includes the cost of replacement.

*pH* means the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution.

*Plumbing Board* means the appointed Board of Plumbing of the City.

*Precipitable solids* means those solids precipitated out of solution when the pH of industrial waste or sewage is adjusted to seven at a temperature of twenty degrees Centigrade.

*Private sewage disposal system* means any septic tank, cesspool or other facility intended or used for the disposal of sanitary sewage.

*Properly shredded garbage* means garbage that has been cut or shredded to such a degree that all particles will be carried freely under flow conditions normally prevailing in public sewers, with no particle greater than one-half inch in any dimension.

*Public sewer* means a sewer in which all owners of abutting property have equal rights and which is controlled by public authority.

***Publicly owned treatment works (POTW)*** means a treatment works as defined by [Section 212 of the Act \(33 U.S.C. 1292\)](#), which is owned by the City. POTW includes any sewer that conveys wastewater to the POTW treatment plant and any sewer that conveys wastewater to the POTW from persons outside the City who are, by contract or agreement with the City, users of the City's POTW.

*Replacement* means the replacement in whole or in part of any equipment or facilities in wastewater transportation or treatment systems to ensure continuous treatment of wastewater in accordance with the NPDES permit and other applicable State and Federal regulations.

*Sanitary sewage* means the liquid or water-carried waste discharged from sanitary conveniences of dwellings, including apartment houses and hotels, office buildings, factories or institutions.

*Sanitary sewer* means a sewer which carries sanitary sewage and industrial waste, or either one of them, and to which storm water is not intentionally admitted.

*Sewage* means any combination of sanitary sewage, storm water, industrial wastes or uncontaminated industrial wastes, or any one of such substances.

*Sewage treatment plant* means any arrangement of devices and structures used for treating sewage.

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*Sewer* means any pipe, tile, tube or conduit for carrying sewage.

*Sewer service charge* means the total charge for sanitary sewer service, including charges for operation, maintenance and replacement and capital cost retirement, and the cost of billing.

*Sewerage works* means all facilities for collecting, pumping, treating and disposing of sewage.

*Storm sewer or storm drain* means a sewer which carries storm water and/or uncontaminated industrial wastes.

*Storm water* means that part of the rainfall or melted snow which reaches sewers as run-off from natural land surface, building roofs or pavements or as ground water infiltration or uncontaminated industrial wastes.

*Suspended solids* means the solids that either float on the surface of, or are suspended in, water, sewage or other liquids, which solids are removable by laboratory filtering.

*SWRC* means the State Water Resources Commission.

*Uncontaminated industrial wastes* means waste water which has not come into contact with any substance used in, or incidental to, industrial processing operations.

**User means any person who, directly or indirectly, contributes, causes or permits the discharge of wastewater into the POTW as defined herein.**

*User charge* means a charge levied on users of a treatment works for the cost of operation and maintenance of such works pursuant to Section 204b of U.S. PL 92-500, as amended, and includes the cost of replacement.

*User class* means the kind of user connected to sanitary sewers, including, but not limited to, residential, industrial and commercial. Specifically:

- A. "Residential users" includes all users who are domiciles or housing units, either single-family or multifamily, whose discharge is primarily of normal domestic strength or a BOD less than 300 mg/l and suspended solids less than 350 mg/l, but which do not exceed more than four dwelling units served by a single water meter.
- B. "Industrial user" means a user who manufactures, assembles or produces an end product, or discharges "industrial waste," as defined in Section 1046.02.
- C. "Commercial user" means all users who are not residential users or industrial users and includes multiple dwellings containing five or more units metered by a single meter, "institutional" facilities and "governmental" facilities.

*Watercourse* means an open channel, either natural or artificial, in which a flow of water occurs, either continuously or intermittently.

(Ord. No. 885, 6-27-94)

#### **1040.02. Deposit of waste in unsanitary manner.**

No person shall place, deposit or permit to be deposited in any unsanitary manner upon any public or private property within the City or in any area under the jurisdiction of the City any human or animal excrement, garbage or other objectionable waste.

(Ord. No. 408, 12-1-75)

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### **1040.03. Treatment of polluted water.**

No person shall discharge into any watercourse within the City or in any area under the jurisdiction of the City any sanitary sewage, industrial waste or other polluted waters, except where suitable treatment has been provided in accordance with this chapter and the statutes and regulations of the State.

(Ord. No. 408, 12-1-75)

### **1040.04. Privy vaults.**

Except as provided in this chapter, no person shall construct or maintain any privy, privy vault, septic tank, cesspool or other such facility intended or used for the disposal of sewage.

(Ord. No. 408, 12-1-75)

### **1040.05. Connection of toilets with sewer.**

The owner of any dwelling, building, structure or property used for human occupancy, employment, recreation or other purposes, situated within the City and abutting on any street, alley, or right-of-way in which there is now located, or may in the future be located, a public sanitary or combined sewer of the City shall, at his or her own expense, install suitable toilet facilities and other sanitary conveniences therein and shall connect such facilities directly to the proper public sewer in accordance with this chapter. Council may require such owner, pursuant to the authority conferred upon it by law or ordinance, to make such installation or connection.

(Ord. No. 408, 12-1-75)

### **1040.06. Private sewage disposal systems.**

- (a) *Required.* Where a public sanitary sewer or combined sewer is not available, as provided in Section 1040.05, a building sewer shall be connected with a private disposal system constructed in compliance with State law and the regulations and orders of Council. Plumbing in the building should provide for a sanitary sewer to the side or front of the building where a public sanitary sewer will most likely be provided in the future.
- (b) *Discontinuance Upon Availability of Public Sewer.* At such time as a public sewer becomes available to a property served by a private sewage disposal system, a direct connection shall be made to the public sewer in compliance with Section 1040.05, and the private sewage disposal facility shall be abandoned and filled with suitable materials.

Upon application of the owner of such property, Council may grant a delay of not more than two years for making connection to a public sewer. Such delay shall be granted only if such private facility is satisfactory and creates no nuisance or health hazard.

- (c) *Operation.* The owner of a private sewage disposal system shall operate and maintain such facility in a sanitary manner at all times at no expense to the City.
- (d) *Conflict of Laws.* No statement contained in subsections (a) through (c) hereof shall be construed to interfere with any additional requirements that may be imposed by Council or the Health Department with respect to private sewage disposal.

(Ord. No. 408, 12-1-75)

### **1040.07. Public sewer connection permits and construction standards.**

No unauthorized person shall uncover; make any connections with; or open into, use, alter or disturb any public sewer or any appurtenance thereof without first obtaining a written permit therefor from the Director of

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Public Service or the Plumbing Board or from such officials as the Director or the Board may designate. All sewers and connections to sewers shall be properly constructed to the standards set by the Director.

(Ord. No. 408, 12-1-75)

**1040.08. Conditions for sewer connection.**

- (a) All connections with sewers of the City shall be made only on written authorization and permits issued therefor by the City on such forms and on the payment of such permit fees and connection fees as shall be established from time to time by resolution of Council.
- (b) Where an existing sanitary, storm or combined sanitary and storm sewer is available to serve a parcel of land, which parcel of land was not previously assessed for such sewer, or to serve a parcel which was assessed but the connection thereto will either exceed the number of benefits or connections included in the original assessment or change the placement of any connection from that established at the time of the original assessment, a nonrefundable connection fee shall be paid prior to the issuance of a permit.
- (c) No sewer connection shall be permitted, unless there is capacity available in all downstream sewers, lift stations, force mains and the sewage treatment plant, including capacity for the treatment of BOD and suspended solids.

(Ord. No. 779, 5-23-88)

**1040.09. Building sewers.**

- (a) *Installation and Connection Costs; Liability for Damage.* All costs and expenses incident to the installation and connection of a building sewer shall be borne by the owner of the property. The owner shall indemnify the City from all loss or damage that may directly or indirectly be occasioned by the installation of such sewer.
- (b) *Connection Permits; Plans and Specifications.* An applicant for a sewer connection permit shall, when required, submit plans and specifications of all plumbing construction within the building or premises involved. Such plans and specifications shall meet the requirements of the plumbing code of the City and all orders, rules and regulations of the Department of Health. When such plans and specifications have been approved by the Director of Public Service, the Plumbing Board, or such official as the Director or the Board may designate, a sewer or plumbing permit shall be issued, subject to final inspection and approval when construction is completed.
- (c) *Inspections.* An applicant for a building sewer permit shall notify the Director or the Board when the building sewer is ready for inspection. The Director, the Plumbing Inspector or a designated representative thereof shall then inspect the building and plumbing construction and if such construction meets the requirements mentioned in subsection (b) hereof, as approved for the construction permit, sewer connection approval shall be issued, subject to the applicable provisions of other sections of this chapter.
- (d) *Maintenance Costs and Permits.* The cost of all repairs to, and maintenance and replacements of, existing building sewers and of the connection of a building sewer to public sewers shall be borne by the property owner. Such owner shall make application for a permit to perform such work to the Director of Public Service, the Plumbing Board or the designated representative thereof.

(Ord. No. 408, 12-1-75)

**1040.10. Prohibited discharges to sanitary and combined sewers.**

- (a) No person shall discharge or cause to be discharged any storm water, surface water, ground water, roof run-off, cooling water or unpolluted industrial process waters into any sanitary sewer.

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- (b) No person shall discharge or cause to be discharged stormwater runoff from a residential eaves trough or roof downspout into a combined sewer.

(Ord. No. 408, 12-1-75; Ord. No. 1012, § 1, 5-1-00)

#### **1040.11. Prohibited discharges to storm sewers.**

No person shall discharge or cause to be discharged into any storm sewer or natural or artificial watercourse, waters or wastes other than storm water or uncontaminated industrial wastes, except upon special agreement with the Director of Public Service, who may seek review by the appropriate agency of the State.

(Ord. No. 408, 12-1-75)

#### **1040.12. Grease, oil and sand interceptors.**

~~(a) *Required; Specifications.* Grease, oil and sand interceptors shall be provided when, in the opinion of the Director of Public Service or the Plumbing Board, such interceptors are necessary for the proper handling of liquid wastes containing grease in excessive amounts, flammable wastes, sand or other harmful ingredients, except that such interceptors shall not be required for private living quarters of dwelling units. All such interceptors shall be of a type and capacity approved by the Director or the Board and shall be located so as to be readily accessible for cleaning and inspection. Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature, and shall be substantially constructed, watertight and equipped with easily removable covers which, when bolted in place, are gastight and watertight.~~

~~(b) *Maintenance.* When installed, all grease, oil and sand interceptors shall be maintained by the owner, at his or her expense, in continuously efficient operation at all times.~~

**(a) *Interceptors/traps required.***

**(1) Grease interceptors/traps shall be provided and maintained in proper operating condition at all times at the expense of the property owner to the proper handling of liquid waste containing FOG. Grease interceptors/traps shall be required for all food service establishments and may be required for other users as determined necessary by the Public Service Director or the Plumbing Board. Grease interceptors/traps shall be sized, constructed and installed as required by the City's specifications and subject to the Public Service Director's approval. At a minimum, grease interceptors/traps shall be cleaned and maintained per the manufacturer's specifications and as provided by this section at the property owner's expense.**

**(2) Oil and sand interceptors/traps may be required in an establishment where sand, oil and flammable wastes or other harmful ingredients could enter the wastewater. If a plug or backup occurs and is directly caused by sand and/or oil, the Public Service Director or Plumbing Board may require that establishment to install an oil and sand interceptor/trap. Oil and sand interceptors/traps are required for establishments engaged in the washing of motor vehicles.**

**(3) All interceptors/traps shall be of a type and capacity approved by the City and shall be located as to be readily and easily accessible for cleaning and inspection. FOG interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight and equipped with easily removable covers which, when bolted into place, shall be gas tight and watertight.**

**(4) Where installed, all FOG interceptors/traps shall be cleaned and maintained by the owner, at the owner's sole expense, and shall be kept in continuously efficient operation at all times. At a minimum, any user required to install an interceptor shall comply with the best management practices as provided by Section 1040.12(b).**

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**(b) Best Management Practices (BMPs).**

**(1) Any user required to install and maintain an interceptor of any kind shall develop and carry out a system of maintenance and clean out such device(s) and shall document and keep:**

- a. A maintenance schedule;**
- b. The identity of the person(s) who cleaned and maintained the interceptor;**
- c. The method and location of fats, oils and grease disposal.**

**(2) Any problems with or damage to an interceptor/trap shall be reported immediately to the owner and the POTW Superintendent.**

**(3) Any damage to an interceptor/trap shall be immediately repaired.**

**(4) No interceptor/trap clean-out material shall be discharged into a sewer.**

**(5) No bacteria or enzyme products shall be used in the maintenance of interceptors/traps.**

**(6) All users shall implement BMPs for grease management to minimize the discharge of food grease to the POTW.**

**(7) Specific BMPs for grease interceptors/traps. All users required to install and maintain grease interceptors/traps shall comply with the following requirements:**

- a. Under-sink grease traps shall be cleaned weekly.**
- b. Clean outs of all other interceptors/traps shall be scheduled such that the interceptor/trap does not exceed twenty five (25) percent solids content (including both top and bottom layers of solids) and there is no visible discharge of fats, oils and grease. At a minimum, an interceptor/trap shall be cleaned out at least once every three months.**
- c. The clean out shall be accomplished by pumping to remove the entire grease mat, liquids, sludges and solids from screens, baffles and air-relief chambers, and wash down of interior walls. The interceptor/trap shall be refilled with clear water before being returned to service.**
- d. The user shall witness all clean out and maintenance of interceptors/traps.**

**(c) Grease interceptor/trap maintenance and inspection log.**

In accordance with federal, state and local requirements, a maintenance log shall be kept at each FSE site for a minimum of three (3) years following the last date recorded. This log shall include at a minimum the date, name of cleaner, grease disposal location, overall trap condition, comments and owner signature and shall be kept in a designated location for inspection by the City on demand.

**(d) Documentation available for review.**

The documentation required by this section shall be available for review by the POTW and copies shall be provided to the POTW upon request.

**(e) Right to inspect.**

The POTW shall have the right to inspect a restaurant (or other establishment where an interceptor/trap is required) at any time for any reason.

**(f) Failure to comply.**

The failure of a restaurant (or other establishment where an interceptor/trap is required) to comply with this section may subject the violator to enforcement action and the remedies as may be available by law and the terms of this article.

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**(g) Failure to maintain required interceptor/trap.**

If a user fails to provide or maintain a required interceptor/trap, the City may do so (or cause the same to be done) and change costs to the user.

**(h) Enforcement.**

Enforcement shall be through the Public Service Director through the POTW Superintendent through the City's Industrial Waste and Pretreatment Ordinances (Chapter 1046).

**(i) Supplement to plumbing code.**

The intent of this ordinance is to supplement the Michigan Plumbing Code as allowed per the Michigan Plumbing Code. In case of conflict between this ordinance and the Michigan Plumbing Code, the Michigan Plumbing Code shall take priority.

**(j) Fees.**

**(1) General.** The City shall charge non-refundable fees for inspection. Inspection and reinspection fees shall be set by resolution of City Council and shall be paid in advance of inspection. The fee for inspection covers the initial inspection and one complete reinspection. If any subsequent reinspections are required, City Council shall establish by resolution a reinspection fee that shall increase at a progressively higher rate for each reinspection. Failure on the part of the owner to provide a 48-hour notice of inspection cancellation and/or failure to keep a scheduled inspection time may result in a non-refundable late fee, as established by City Council resolution.

**(2) Administrative fee.** If any registered food service establishment owner fails to pay any fees required by this Code, an administrative fee as established by City Council resolution shall be assessed.

**(3) Payment.** Any fee for required inspections or reinspections, including the administrative service fee, shall be paid by the owner whose name appears on the City's real property tax assessment records.

**(4) Lien on property.** Any unpaid fees or costs assessed under this Code shall be a lien against the real property and shall be collected as allowed by law.

**(5) Notification to add to tax roll.** The owner shall be notified of the amount of unpaid fees by first-class mail at the address shown on the City Assessor's records. If the owner fails to pay the amount owed within 30 days after mailing the notice, the City Assessor shall add the amount to the next tax roll of the City and it shall be collected as provided by law for the collection of City taxes.

**(k) Penalty.**

The penalty for violation of this ordinance shall be as per provided in [Section 1046.99](#).

(Ord. No. 408, 12-1-75)

### **1040.13. Special agreements for industrial waste treatment.**

No statement contained in Sections 1040.10 through 1040.12 shall be construed as preventing any special agreement or arrangement between the City and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the City for treatment, subject to payment by the industrial concern of the estimated cost of such treatment. Any such agreement or arrangement shall include applicable surcharges as provided in Chapter 1042.

(Ord. No. 408, 12-1-75)



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#### **1040.14. Damage to sewerage system.**

No unauthorized person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the City sewerage system or treatment plant.

(Ord. No. 408, 12-1-75)

#### **1040.15. Inspections.**

The Director of Public Service and other duly authorized officials or employees of the City, or State or Federal authorities, bearing proper credentials and identification, shall be permitted to enter upon all properties for the purpose of inspection, observation, measurement, sampling and testing, in accordance with this chapter, at any time during reasonable or unusual business hours.

(Ord. No. 408, 12-1-75)

#### **1040.16. Continued violation of chapter constitutes nuisance.**

Any continued violation of any of the provisions of this chapter, after due notice thereof is given, shall be deemed a public nuisance, and may be abated by suit in equity by the City in any court of competent jurisdiction. Such remedy shall be in addition to the penalty provided in Section 1040.99.

(Ord. No. 408, 12-1-75)

#### **1040.17. Supplement to plumbing code.**

This chapter shall be considered to be supplemental to and concurrent with the Plumbing Code of the City.  
(1958 Code, § 27-32)

#### **1040.18. Falsification; tampering with monitoring device.**

No person shall knowingly make any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to this chapter. No person shall falsify, tamper with or knowingly render inaccurate any monitoring device or method required under this chapter.

(Ord. No. 658, 10-3-83)

#### **1040.99. Penalty.**

In addition to the penalty provided in Section 202.99, the City may recover reasonable attorney's fees, court costs, court reporter's fees and other expenses of litigation, by appropriate suit at law, against any person found to have violated any of the provisions of this chapter or any order, rule, regulation or permit issued hereunder.

(Ord. No. 658, 10-3-83)

Editor's note(s)—See Section 202.99 for general Code penalty if no specific penalty is provided.



# The City of Lansing's Public Service Department Urges City Council to Approve the Amendments to Ord. 1040 Sewers Generally

## Problem

- Fats, oils, and grease (FOG) have clogged the City of Lansing's sewer system.
- FOG includes meat fats, food scraps, butter, salad dressing, and cooking oil.
- When poured down the drain, FOG builds up in sewer pipes.
- FOG buildup leads to sanitary sewer overflows (SSOs), which are a threat to public health and the environment because **raw sewage** is released into waterways.
- The cost to clean up a single SSO is **\$5,000** to **\$6,000\*** depending on location.

## Solution

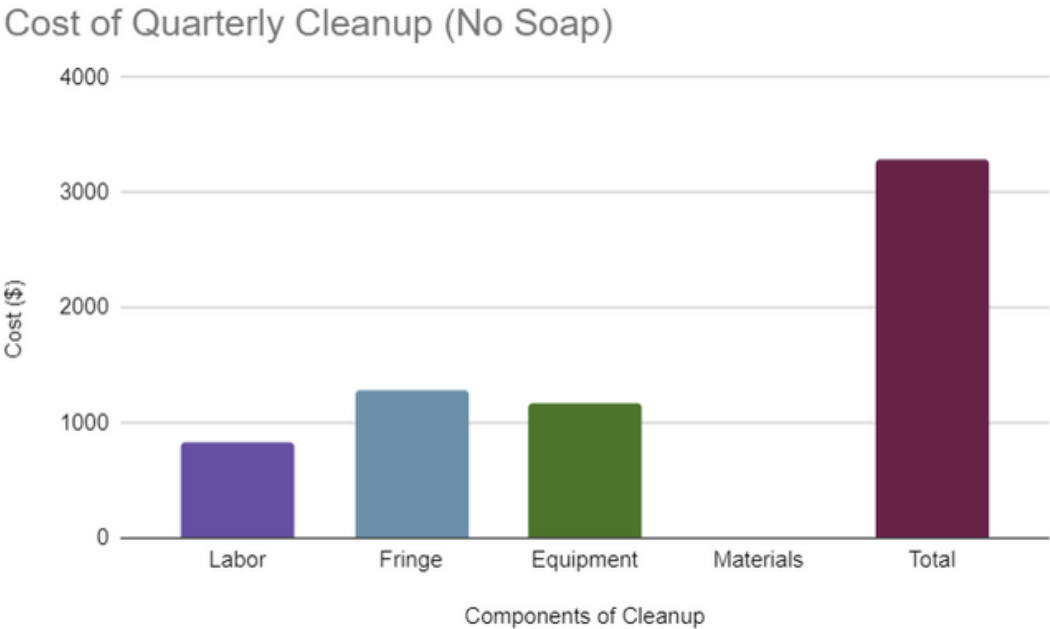
- Approve the amendments to Ord. 1040 to protect human and environmental health and save the City money.



# The Real Cost of FOG Cleanup

The City of Lansing currently has **17 trouble spots**.

The cost of one cleanup without soap = **\$3,300\***



The cost of one cleanup with soap = **\$5,500\***



\*Estimated numbers through conversations with Lansing's Public Service Deputy Director

# Public Health

- Sanitary sewer overflows release untreated or partially treated sewage. Bacteria, viruses, protozoa, intestinal worms, mold, and fungi found in raw sewage are a serious threat to public health.
- Mild: mild gastroenteritis, including stomach cramps and diarrhea
- Life threatening: cholera, dysentery, hepatitis B, cryptosporidiosis, and severe gastroenteritis
- The public may be exposed through:
  - sewage in drinking water
  - direct contact with raw sewage on streets, in buildings, and in recreational waters
  - eating fish or shellfish from polluted waters



# Environmental Health

- Raw sewage gets into rivers, lakes, and streams, affecting water quality.
- Raw sewage can cause:
  - hypoxia (lack of oxygen in the water)
  - harmful algal blooms
  - habitat degradation
  - a build up of floating debris
- The 50% of documented water-dependent threatened or endangered species are at risk of being exposed to raw sewage.



# Financial

- Backups into buildings damage the building's infrastructure and contaminate personal belongings. Items, such as furniture, rugs, and blinds, have to be replaced since they came into contact with raw sewage.
- There is an economic loss when rivers, lakes, and streams have to be closed off to the public.
- A single sanitary sewer overflow clean up costs the City \$5,000 to \$6,000.



Organism	Health Effects
<b>Viruses</b> (ex: Norovirus)	<ul style="list-style-type: none"><li>• Diarrhea</li><li>• Gastroenteritis</li><li>• Hepatitis</li><li>• Meningitis</li><li>• Pneumonia</li><li>• Paralysis</li><li>• Respiratory infections</li></ul>
<b>Protozoa</b> (ex: Cryptosporidium)	<ul style="list-style-type: none"><li>• Abdominal cramps</li><li>• Intestinal parasites</li><li>• Severe diarrhea</li><li>• Ulcers</li></ul>
<b>Bacteria</b> (ex: E. coli)	<ul style="list-style-type: none"><li>• Abdominal pain</li><li>• Cholera</li><li>• Food poisoning</li><li>• Severe diarrhea</li><li>• Typhoid fever</li></ul>
<b>Helminths</b> (ex: Tapeworm)	<ul style="list-style-type: none"><li>• Anemia</li><li>• Chest pain</li><li>• Digestive problems</li><li>• Fever</li><li>• Insomnia</li><li>• Muscle aches</li><li>• Vomiting</li></ul>