Chapter IV

Tanneries, Piggeries, Municipal Waste, and Pesticides

Introduction

This chapter discusses several activities which may have contributed to environmental conditions in Woburn. These activities include waste disposal from piggeries and tanneries, as well as municipal refuse disposal and the use of herbicides and pesticides within the city.

The Tannery Industry

The Tanning Industry is an industry with a relatively long history. In 1869, there were over 7,000 tanneries in the United States, although by 1976 the number had shrunk to 298. As was noted in Chapter 1, the tanning and related leather industries were important in Woburn from the middle of the nineteenth century until after World War II. Tanning essentially involves the production of various types of leather from cattle hides, sheepskins and goatskins. The wastes from this industry have been ranked in the past as "among the heaviest and most polluting of all industrial wastes."[1] They have been characterized as having a "disagreeable appearance, a bad smell and a high degree of intractability." In addition, the various tanning processes involved the use of chemicals that would today be characterized as hazardous.

The primary tanning processes, both of which took place in the various Woburn tanneries, can be generally characterized as vegetable tanning and chrome tanning. Vegetable tanning is used primarily for heavy leathers and chrome tanning for light. Vegetable tanning, using natural tannins was utilized almost entirely up until World War I. Chrome tanning and other synthetic tanning materials developed around this period, and by 1977 approximately 85 percent of the leather produced in the nation utilized chrome process.[2] Tanneries, regardless of method, produced a heavy volume of wastes with a large amount of suspended matter. They included a variety of toxic and non-toxic material. The suspended matter included such constituents as hair, flesh particles and suspended particles of lime and calcium carbonate. These have a high BOD

(Biochemical Oxygen Demand). Tannery wastes were "inherently putrescible and could become highly offensive in terms of odor." Spent tan liquors from vegetable tanneries produce high colors in receiving waters while wastes from chrome tanneries essentially lacked color. Among the toxic materials that could be present in the waste stream were arsenic, which was frequently used in the removal of hair from hides, and chromium (trivalent), which was present in the discharges of the spent baths of mineral tanning agents and in the sludge. In addition, other chemicals were present such as lime and sodium sulfide that could have negative effects on the environment and on the operation of biological sewage treatment plants.[3]

Chapter III of this report on the pollution of the Aberjona River has already observed how tannery wastes such as bark liquor, water-washings, lime, hen-manure and fleshings created offensive problems in the river and its tributaries in the late-ninteenth century. Considerable wastes were also disposed of on-site. The 1874 report of the MSBH noted, for instance, that some tanneries disposed of their "liquor refuse" by allowing it "to flow into pits and thence to soak slowly into the gravely subsoil..."[4] Some tanneries instituted treatment processes for their wastes and disposed of the liquid residual in sewers, if available. Sludge from the chrome tanning processes however, was not permitted into the Metropolitan District Sewer and was piled on private dumps. In addition, in the pre-World War I period, these treatment processes did not necessarily work effectively.[5]

In the first decades of the twentieth century, the Woburn Times reported many problems with tannery wastes on site. Most of the reporting concerned the creation of offensive odors which constituted a nuisance and were said to lower property values.[6] Some tanneries deposited their sludge on dumps on private property while others kept it in catch basins for two months and then piled it on a dump near Russell Brook, producing "a very irritating, obnoxious odor."[7] The Bay State Leather Company (formerly the Champion Company), for instance, deposited its sludge on an "inadequately underdrained open field," causing, according to the Woburn Board of Health, "a nuisance and a menace to the public health..." Odors were also produced from its settling tanks and sludge beds.[8] When tanneries first received shipments of hides, hundreds of hides were hung on company fences to dry, and "blood, juice and other offal" collected in the street gutters. The fields adjacent to the railroad tracks were said to be "broad expanses of glittering patent leather."[9] The tanneries protested that the odor problems were a result of the absence of a sewer to

dispose of their wastes, but the existence of a sewer would still have necessitated a disposal site for sewer sludge from the chrome tanning treatment processes since they were not allowed in the sewers.

The use by tanneries of local dumps for sludge disposal continued well after World War II. An EPA sponsored national inventory in 1976 for instance, found that most tannery wastes were deposited in landfills or open dumps (60%), and the remaining 40% to trenches, lagoons and holding ponds.[10] Although the tanneries were greatly reduced in number after World War II, and although those that remained in Woburn improved their pre-treatment plants, they were still faced by the necessity of sludge disposal.[11] In addition, because of land use changes, present residential areas may be located in areas where tanneries formerly stood. There is at least one block in the city of Woburn that was the site of a tannery in 1918, but which had become largely residential by 1926.[12]

The Woburn Piggeries

Another source of nuisances and threats to the public health from waste disposal in Woburn were the North Woburn piggeries. Although not an "industry" in the normal sense of the word, piggeries were still private operations conducted for profit that produced a waste product. In 1920 there were 37 piggeries in the city, and a number still remained after World War II. In the 1950s and 1960s, Woburn attempted to eliminate the piggeries, although there were still eight in 1965.[13] In 1957, the MSDH found that the piggeries were a source of direct contamination to Hall's Brook and the Aberjona. The "pollution is evident to the eye." noted the report, "in the form of turbid water, profuse fungus growth on banks and bottom and odorous scum accumulations along the banks."[14] In 1967, the piggeries located in North Woburn still constituted a problem. The largest piggery had about 1,000 pigs and the pigs were fed trucked-in and cooked garbage. The pig manure was "piled or is buried wherever it is convenient to do so." Drainage from the piggeries was polluting the Aberjona River and Mishawum Lake.[15]

In May, 1968, an investigator for the MSDH reported that about 20 loads of "decomposing pig manure" had been removed from the site of a former piggery off Olympia Avenue in Woburn and dumped in a nearby marsh and small pond. This pond and marsh were "drained by a flowing brook that drains into the Aberjona River upstream from the Rifle Range Wells." The distance from well "H" to the dumping site was, according to

the investigator, 1,700 feet.[16] In 1970, another MSDH investigator examined one of the remaining piggeries and found that "organic and coliform pollutants can originate from the farm intermittently, i.e. during vigorous runoff or thaws." The same investigator reported that a contractor excavating the Industri-plex site had "unearthed pig carcasses and pig excrement which was still quite odorous." "It can be thus assumed," he added, "that these former piggeries have contributed pollutants to the Aberjona Watershed..."[17]

The Woburn Dumps and Landfill

Historically, in Massachusetts cities and towns, rubbish and ashes were usually disposed of in open dumps, often located on the fringe of the community. Material deposited here was usually burned. Garbage was often collected separately and fed to pigs. This was the pattern in Woburn until after World War II. In 1920, the city had an open dump used for rubbish deposit and burning that was located about five minutes north of the Commons on Winn Street. In addition, garbage was collected separately to be fed to pigs on a pig farm located about 1 1/2 miles from the Commons. From 1930-1935 a dump was maintained on Main Street in North Woburn, and from 1935-1954 another dump was operated on Mishawum Road. In the years before 1945, there were often complaints about nuisances from the dumps. In addition, throughout the 1930s and 1940s, residents registered hundreds of complaints each year concerning garbage and rubbish collection.[18] A number of private dumps also existed in Woburn, while dumping on open lots was not uncommon.[19]

The city of Woburn developed a dump in North Woburn after World War II. This dump was also an open burning dump. It had a history of "fires, odors, rodents and hazardous conditions".[20] The dump accepted industrial wastes such as tannery sludge.[21] It was also the site for the deposit of potentially hazardous material from outside the city. In 1967 for instance, "Muck" from a dredging operation in the Mystic River in Somerville was dumped at the "Old" city dump as well as at Newton Street and Olympia Ave. This material contained various proportions of sulfides. The MSDH "memorandum" concerning the material noted that "disposal of these materials near a ground water supply could be affected by leaching..."[22]

In 1965 the city began operating a dump at Merrimac Street and New Boston Street in North Woburn as a "sanitary landfill" Sanitary landfills involved the technique of

excavating trenches on a site, covering the wastes deposited there with the excavated fill on a daily basis and then compacting the material. The landfill was located in a swampy area that drained into a ditch tributary to Mishawum Lake and at the northern edge of the Aberjona aquifer. According to Woburn Mayor John W. Rabbitt, the landfill was "never run properly because we dumped into brooks. It should have never been put there because it was in the middle of a wetlands area." In addition, no system was constructed to prevent leachate from entering the brook or the groundwater.[23] A report in 1970 noted, for instance, that drainage from the dump contained a high BOD, fecal and total coliform count.[24] Another study in 1971 reported that the landfill was actually operated as an "open face dump, since the cover material is inadequate and poorly applied." In addition, material was dumped directly into the water surrounding the dump, draining eventually into the drainage ditch which led to the Aberjona.[25]

In addition to the poor drainage and conditions at the landfill, there were incidents specifically involving industrial wastes. In 1968 for instance, 25,000 gallons of paint deposited at the dump by a Malden manufacturer burned and exploded.[26] In July, 1971, investigators from the Woburn Conservation Commission reported that large quantities of sludge from animal hides processed for gelatin manufacturing was dumped on the ground. This material had formed a hard crust over a "sticky innermass."[27] Actually, the gelatin company had been depositing its sludge at the landfill since 1966, causing problems primarily of odor and nuisances.[28] In September, 1972, the gelatin waste was among the complaints cited against the Woburn Landfill by the DEQE.[29] Because part of the area occupied by the landfill had been previously used as a dumping ground for chemical wastes, dump excavations created the potential for disturbing the wastes and creating a hazard. In October, 1969, for instance, residents of North Woburn threatened to bring a suit against the city because excavations in the dump in 1968 had permitted "organic wastes containing chemicals from a processing plant in Woburn, rubbish and other refuse" to contaminate the groundwater and their driven well."[30]

Throughout the 1970s, there was a steady stream of citations by the MSDH and the DEQE concerning the improper operation of the Woburn landfill. The most common citations involved improper operation and covering of daily refuse; inadequate spreading and compaction of refuse; inadequate disposal of waste sludge from the gelatine manufacturing process; dust; odors; inadequate drainage; inadequate

supervision; and maintenance of conditions favorable to the production of insects and rodents. Such violations, wrote the DEQE in 1983, "are contributing to leachate pollution of adjacent wetlands and causing a public health nuisance."[31] The landfill, observed the consulting engineers hired by the city in the summer of 1983 in response to a DEQE order to correct its deficiencies, had a "sad and sordid history." To rectify the situation "which is not only in violation of the statutes governing landfills, but is also far less than cost effective for the City," said the consultants, "will require an entirely new attitude and a commitment by the City."[32]

The Use of Herbicides and Pesticides by the City of Woburn and by the Boston and Maine Railroad on its Right-of-Way in Woburn

The use of chlorinated hydrocarbon compounds for herbicides and pesticides was extremely widespread during the post-World War II decades. The City of Woburn utilized various chlorinated hydrocarbons to control mosquitoes during the 1970s and probably before. Spraying of insecticides was also intended to protect against foliage-killing insects. The program began in the early spring and continued through the summer. At times spraying was so heavy that visibility was reduced. In August, 1973, for instance, an automobile struck a pedestrian reportedly because the "fumigating mist" was so thick.[33]

Spraying of trees was conducted in the morning by the Woburn Tree Department while the Woburn Health Department "sponsored" the mosquito "fogging" that was conducted at night. The insecticides used by the Tree Department consisted of three chemicals: malathion, methoxyclor and kelthane. To kill mosquitos the Health Department used malthion and kerosene. "The pesticide and kerosene mixture." wrote a Woburn Times reporter, "forms a fog which rolls along the ground and kills any adult mosquitoes." In the spring the Board of Health sprayed the wetlands with an insecticide called abate, developed to kill mosquito larvae. All of the insecticides, according to a Woburn Times article, were registered with the Massachusetts Board of Pesticides.[34]

These pesticides, however, as the Woburn Times article noted, included very toxic compounds among their breakdown products. Malathion, for instance, is a mixture of the chlorinated hydrocarbon aldrin, a pesticide, with other herbicides and insecticides. Widespread aldrin-dieldrin

contamination of biological systems appeared in the 1960s and in March 1971, the EPA canceled all federal registrations of products containing aldrin and dieldrin. In September, 1974, the EPA announced suspension of the use of aldrin/dieldrin except for termite control.[35] Methoxychlor is a chlorinated hydrocarbon insecticide of long residual activity. A DDT analog, it has relatively lower toxicity to mammals and does not bioaccumulate.[36] Kelthane (Dicofol) is an important analog of DDT and contains about 10 percent DDT. While it does not appear to degrade directly to DDT, it can degrade to 4.4-dichlorodibenzophenone (DPC), a pathway in common with that of DDT.[37]

Another important use of herbicides in the Woburn area was by the Boston & Maine Railroad in an attempt to control weeds along its trackage. Before the 1960s a common method of weed control was to spread diesel fuel oil on the trackage. Various herbicides were used in this period to "inhibit and control weed growth." The substances used included chlorinated hydrocarbons. In the mid-1960s, the railroad contracted with professional weed control organizations to keep its tracks free of weeds. According to an officer of the railroad, "The development of environmental protection laws in the mid-1960s was one reason for which railroads and others elected to contract for services with professional applicators trained and qualified in the use of these products". During the 1970's the herbicides used by the railroad included bromacil, 2-4 D, monosodium methane arsenate, atratol, diquat, amdon, banvel, and EVIK.[38]

FOOTNOTES

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1. Edward W. Moore, "Wastes from the Tanning, Fat Processing, and Laundry Soap Industries," in Willem Rudolfs (ed.), Industrial Wastes: Their Disposal and Treatment, (New York: Reinhold Publishing Corp., 1953), p. 141.

2. Russell Dawson, "Leather Tanning Industry: Sludge Problems Ahead," Sludge Magazine (Sept. - Oct., 1978), p. 24.

3. Joseph W. Masselli, et. al., Tannery Wastes: Pollution Sources and Methods of Treatment, New England Interstate Water Pollution Control Commission, Boston, June, 1958, pp. 23-24.

4. Annual Report MSBH, 1874, pp. 127-129.

5. Annual Report MSDH, 1922, pp. 43-44; Lilian Abbott, "Community Survey: Woburn, Massachusetts," Boston: American Red Cross, 1920, p. 80-83.

6. See, for instance, Woburn Times, Feb. 27, Sept. 14, 1911; June 2, Oct. 14, 1914.

7. Abbott, "Community Survey," pp. 80-83.

8. Woburn Times, May 15, 1915.

9. Woburn Times, Feb. 27, 1911, May 20, 1915

10. "Leather Tanning Industry," p. 24.

11. In the case of at least one tannery, the record shows that this waste was hauled "to a local dump, along with the screenings," See, "Engineer's Report - Study of Sanitary Condition of Aberjona River," p.8.

12. Susan E. Titus, "Survey and Analysis of Present/Potential Environmental Impact Sites in Woburn, Massachusetts," in Remote Sensing, (1985), p. 178.

13. Abbott, "Woburn Community Survey," 1920, p. 84; John J. Donohoe, Woburn Planning Board to Dept. of Natural Resources, Aug. 12, 1970.

14. Engineer's Report, "Study of Sanitary Condition of Aberjona River," May 24, 1957, pp. 2,5.

15. Camp, Dresser & McKee, "Report on Aberjona River," Nov., 1967, p. 12.

16. Joseph X. Conley, "Notes Relative to: Woburn-Water Supply-disposal of Pig Manure in Brook Tributary to Aberjona River," May 20, 1968; John C. Collins, Div. of Sanitary Engineering, to Woburn Board of Health and Charities, June 11, 1968.

17. Robert M. Cady, "Aberjona River Sanitary Survey," Oct., 1970, pp. 5-6.

18. Annual Reports, Woburn Board of Health, 1931-37, 1940-44.

19. Abbott, "Community Survey,: Woburn, Massachusetts," pp. 81-84; Woburn Times, Jan. 15, 1986.

20. Woburn Times, Jan. 14, 1986.

21. "Engineer's Report: Study of Sanitary Condition of Aberjona River," MSDH, May 24, 1957, p. 8.

22. Mr. Rosenthal to Mr. Collins, "Memorandum: Samples from Dredging Operations - Mystic River Dumping in Woburn," Mar. 17, 1967.

23. Woburn Times, Jan. 15, 1986.

24. Robert M. Cady, "Aberjona River Sanitary Survey," p. 7.

25. Fred L. Defeo, "The Establishment and Operation of the Aberjona River Commission," M.S. Thesis, Tufts University, Oct. 1971, p. 31; Woburn Times, Jan. 7, 1972.

26. Woburn Times, Jan. 14, 1986.

27. Woburn Conservation Commission, "Report of Findings - Field Inspection Tour North Maple St. Area - Woburn," July 24, 1971.

28. Edwin S. Walker, Woburn Board of Health to William St. Hilaire, DEQE, Apr. 27, 1979.

29. "Citation: Notice of Violation of the Regulations for the Disposal of Solid Wastes by Sanitary Landfill," MSDH, Sept. 22, 1972.

30. Woburn Times, Oct. 29, 1969.

31. William J. St. Hilaire, DEQE, to Woburn Board of Health, July 1, 1983.

32. H. W. Moore to Woburn Board of Health, Aug. 1, 1983.

33. Woburn Times, Aug. 28, 1973

34. Woburn Times, July 9, 1975.

35. Council on Environmental Quality, Environmental Quality, 1975. Washington: GOP, Dec., 1975; pp. 376-382.

36. G. G. Hauley, The Condensed Chemical Dictionary (New York, 1977).

37. P.R. Walsh & R.A. Hites, "Dicofol Solubility and Hydrolysis in Water," Bull. Envir. Control and Toxic. (1979), 22;305-311.

38. D. P. Coffey, Boston and Maine Corporation-Debtor, to Helen Waldorf, DEQE, Feb. 11, 1983.