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A Case Study of the Sewer Bond Issue in Logan, Utah: 1957-1965

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A CASE STUDY OF THE SEWER BOND ISSUE IN LOGAN, UTAH: 1957-1965

by

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Barbara Stoll Sinclair
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ABSTRACT

A Case Study of the Sewer Bond Issue

In Logan, Utah: 1957-1965

by

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Utah State University, 1969

Major Professor: Calvin W. Hiibner
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A single political issue, public financing of a sewage treatment facility for the city of Logan, was studied in an attempt to determine the effect of certain variables on the formation of public policy.

The case study method of research was followed, and conclusions were based on data obtained through personal interviews as well as through study of public documents.

Among factors which influenced the decisional process was the degree to which technological knowledge was accepted. Policies developed by the state legislature and the federal bureaucracy to deal with environmental pollution also affected the local situation. A conflict which arose over interpretation of certain of these policies was largely resolved in court.

(112 pages)

INTRODUCTION

In 1968 an official of the Cache County Chamber of Commerce declared that it was not unusual, and certainly not alarming that taxpayers in Logan, Utah, the county seat, had twice rejected proposals for issuance of city bonds to finance improved sewage facilities. Recent statistics, he explained, indicate that most cities in the United States undergo at least two unsuccessful bond issue elections before voters finally agree to the expenditure of public funds for civic improvement.

However, Logan City's three sewage bond elections, in 1957, 1962, and 1965, caused much divisiveness within the community, and the problem was not resolved without serious disunity between the State of Utah and some political subdivisions.

The issue that dominated this controversy concerned the method of sewage treatment, which involved economic considerations and feasibility of adapting one system or the other to local conditions. It assumed wider significance when the constitutionality of control by a state regulatory agency was challenged.

Cities and towns in Utah commonly used mechanical plants, such as the high rate trickling filter system proposed in engineering studies in 1957 and 1962 for treating Logan's sewage. An alternative method of treatment by waste stabilization ponds (lagoons) was not approved by the State Boards of Health and Water Pollution Control.[1]

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[1] As defined in Cornell, Howland, Hayes, and Merryfield, "Engineering Report on Sewage Collection and Facilities for the City of Logan,"

The two state agencies have statutory authority to classify state waters according to degrees of quality and use. This authority provided a basis for control over the types of sewage treatment systems utilized by municipalities, for the Water Pollution Control Board could demand that city sewage be adequately treated before its discharge into waters covered by the Board. The Board's interpretation of adequacy of treatment led to the adoption of rigid standards limiting engineering design of facilities.

The classification of waters into which the effluent from any treatment facility at Logan would flow dictated that a secondary sewage treatment process be used. This is usually required where the strength and quantity of sewage is high and the receiving streamflow is not capable of supplying sufficient dilution water and oxygen to handle the loads imposed on it by partially treated sewage. Secondary, or additional, treatment involves the further decomposition of organic matter in sewage.[2]

An important factor in determining the type of treatment facility to be used was the problem of excessive groundwater in the southeast, or Island, section of the city. The Island is mainly a residential section, situated in a low area between the Logan River and the Logan-Hyde Park-Smithfield canal. A map of Logan City is included in the Background section of this thesis.

(unpublished report, Boise, Idaho, 1964), p. 63, lagoons are essentially large, shallow bodies of water into which untreated sewage is introduced and detained for a period of time sufficient to permit stabilization of the sewage by a fairly complex natural process involving sunlight, air, water currents, algae, and bacterial action.

[2] Ibid., p. 57.

Logan has a hydraulic load (total water and sewage flowing through the system) comparable to a city many times its size, due to the high level of groundwater in this area. The old Island sewer system had been designed to accommodate drainage of this water by leaving open joints. A mechanical plant designed to handle this load would necessarily have had to be of tremendous size, and upkeep and maintenance would have been costly. Although the cost of lagoons would be less under such conditions, the ponds themselves would need to be larger than usual and the purchase of more land for the site would be involved.[3]

Hypotheses and Purpose

Subjective beliefs which underlie the following hypotheses will be tested for validity by recording the biography of Logan's sewage lagoons, and drawing conclusions based on the outcome of research:

A. The complexity of technical requirements in modern environmental development causes policy-making functions to conform to the standards and limitations of technology.

B. Demands at different levels of government initiate local community action, which is subsequently shaped by legal interpretations, or modifications of existing statues, or both.

C. Local governmental policy reflects current predominant community interests.

D. None of these. Voters simply "muddle through" the policy-formation process with a perceived community need as catalyst.

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[3]Norman B. Jones, personal interview in Logan, Utah, September, 1968.

Research and Procedure

The case study method was followed in research and presentation of material. Information came from interviews with private citizens who promoted positive action as single-issue leaders, with city officials, and with neutral technicians.

Correspondence and transcripts of meetings between professional persons and agents of state government were researched to aid in the understanding of technical and legal aspects of the controversy. Other sources of information included technical reports, letters to the writer, public documents, and newspaper articles.

Setting

Logan City is a corporate municipality located in Cache County, a level valley about 50 miles long and 12 miles wide, enclosed on the east and west by spurs of the Wasatch Mountains. The eastern boundary is known as the Bear River Range. The broken chain of high peaks which form the western boundary extends far beyond the valley north and south.[4]

The Bear River drainage system begins in the Uintah Mountains in Summit County, Utah, winds a 500-mile course through southern Wyoming, northern Utah, and southern Idaho, and enters Cache Valley through Bear River Narrows in the northeast end of the valley. The Bear River empties into the Great Salt Lake. Principal sources of water are the

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[4] William Peterson, "Physical Description and Geology," in The History of a Valley, ed. by Joel E. Ricks and Everett L. Cooley (Salt Lake City, Utah: Deseret News Publishing Co., 1956), pp. 1 and 2.

Bear River and its tributaries. Four mountain streams are of special importance to the area: the Little Bear, Logan, Blacksmith Fork, and Cub rivers. Irrigation of lands on the level floor of the valley provided a basis for agricultural development.[5]

Economy of the area is based primarily on dairying, crop farming, and industries dependent on agriculture. Logan and Preston, Idaho, 30 miles to the north, are major marketing and distribution centers for the valley.[6]

Utah State University, with a student enrollment of about 9,000 during regular school session, is situated on a bench in the northeast section of town.

In 1964 the population of Logan, including college students, was approximately 20,400 persons. This figure represents an increase of more than 100 percent since 1920 and an average annual growth rate of about two percent.[7]

Local government is administered by a mayor and two commissioners. Mayors are elected for four-year terms and commissioners are elected alternately for two-year terms. Other officials include an auditor, the only full time elected official, and a city attorney and engineer, both appointed by the Commission.

Ownership of lights and water, two public utilities with high rate structures, has helped Logan City Corporation to maintain a

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[5] Leonard J. Arrington, "Life and Labor among the Pioneers," in The History of a Valley, ed. by Joel E. Ricks and Everett L. Cooley (Salt Lake City, Utah: Deseret News Publishing Co., 1956), pp. 147-149.

[6] Ibid., pp. 240-247.

[7] Cornell, Howland, Hayes, and Merryfield, "Engineering Report on Sewage Collection and Facilities for the City of Logan," p. 1.

desirable financial position in recent years. Property taxes provide the other chief source of revenue.[8]

A local evening newspaper, The Herald Journal, is owned by the Scripps League of Seattle. Some residents also subscribe to The Salt Lake Tribune or The Deseret News. The latter is a publication of the Church of Jesus Christ of Latter-day Saints. Its circulation reflects the predominant religious affiliation. During time covered by this study, there was one local AM radio station, KVNU.

There are about 30 civic and social organizations in Logan, and a like number in Cache County.[9]

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[8] Venal Jones, personal interview in Logan, Utah, May, 1968.

[9] Cache Chamber of Commerce, "Clubs and Organizations in Cache Valley and Their Presidents," Logan, Utah, 1967-1968. (Mimeographed.)

BACKGROUND:

POLITICAL-LEGAL FRAMEWORK AND TECHNICAL DATA

The Water Pollution Control Act and WPCB

By the early 1950's it was recognized that sewage discharge from a growing community must be adequately treated before it enters state waterways, where it becomes a stream pollutant, a potential health hazard, and an aesthetic nuisance. To safeguard waters of the state, the Utah Legislature in 1953 passed the Water Pollution Control Act, and under its authority created a regulatory agency, the Water Pollution Control Board (WPCB).[1]

The Act states, in part, that

> . . . pollution is contrary to the best interests of the state and its policy for the conservation of the water resources of the state, . . . it is declared to be the public policy of this state to conserve the water of the state and to protect, maintain and improve the quality thereof for public water supplies, for the propagation of wildlife, fish and aquatic life and for domestic, agricultural, industrial, recreational and other legitimate beneficial uses; to provide that no waste be discharged into any water of the state without first being given the degree of treatment necessary to protect legitimate beneficial uses of such waters . . . to insure due consideration of financial problems imposed on water polluters through pursuit of those objectives.[2]

The nine members of the Water Pollution Control Board, to be appointed by the Governor with consent of the Senate for eight-year terms which expire consecutively, were to include the state health

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[1] Water Pollution Control Act, title 73, ch. 14, Utah Code Annotated, 1953.

[2] Ibid., sec. 1.

commissioner; a representative from each of the state's industries (minerals, food processing, agriculture and livestock, fish, recreation, and wildlife, and other manufacturing); a representative for municipalities; and two members at-large. The Board was to choose from among its members a chairman and vice-chairman and appoint as executive-secretary the chief sanitary engineering officer of the State Health Department, who was to administer and carry out policies of the Board.[3]

Functions and powers of the Board were to include the development of programs for control and abatement of pollution of waters of the state, accepting and administering federal grants, conducting investigations in relation to the discharge of its duties, setting standards of quality of waters of the state and classifying such waters according to their reasonable uses in the interest of the public, issuing orders prohibiting or abating discharges of wastes into waters of the state, reviewing data relative to disposal systems in connection with the issuance of permits which are required by the Act, and giving reasonable consideration in the exercise of its duties and powers to financial requirements which may be imposed.[4]

Waters may be reclassified and upgraded with approval of the State Legislature, but the Board is to conduct public hearings prior to such reclassification.[5]

If the Board has reason to believe there has been a violation of the Act, they may hold hearings, make findings of fact and conclusions

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[3] Ibid., sec. 2.

[4] Ibid., secs. 3 and 4.

[5] Ibid., sec. 6.

of law on the basis of evidence produced at the hearing and enter such order that will best further purposes of the Act.[6] Decisions are to be rendered by a majority of the Board. In case of contumacy or refusal to obey a notice of hearing or subpoena issued by the Board, any district court has jurisdiction to issue an order requiring persons affected to appear and testify or produce evidence. Failure to do so may be regarded as contempt of court.[7]

Persons who violate provisions of the Act or an order of the Board may be held guilty of a misdemeanor and may be enjoined from continuing the violation. The state's attorney general is to bring action for an injunction against violators.[8] Judicial review in any district court is available to those accused of being in violation, providing they had appeared at the Board hearing or had not been served notice of the hearing. The court may receive additional evidence during review.[9]

State Regulation of Waste Disposal Systems

In 1954 the WPCB and the State Department of Health adopted a code for regulating waste disposal systems known as "Standards for Sewage Works," which was at the time essentially the same as the "Recommended Standards for Sewage Works" passed by the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers. This Board was comprised of representatives from Illinois, Indiana, Iowa, Michigan,

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[6] Ibid., sec. 7.

[7] Ibid., sec. 8.

[8] Ibid., sec. 10.

[9] Ibid., sec. 11.

Minnesota, Missouri, New York, Ohio, Pennsylvania, and Wisconsin.[10]

This same set of recommendations was commonly known as the "Ten-state Standards." Utah's version, based on a revision of these standards, covered design criteria used in approving plans for treatment plants. A modification of Utah's code allowed lagoons for further treatment of effluent from treatment plants, but did not permit raw sewage lagoons.[11]

Technical Report of Local Conditions

The WPCB demanded that certain industries and cities in Utah take effective action to provide adequate treatment of sewage before it entered state waters. Logan City officials were pressed to correct existing conditions, because city sewage had been discharged without treatment to natural and man-made watercourses adjacent to the city since 1918, when the first sanitary sewer collection system was constructed. Wastes were eventually carried to the Bear River.

The existing sewage system

The city was served by two sewage systems, the North Outfall system, serving approximately 2,100 acres in the northern two-thirds of the city, and the southeast or Island Outfall system, providing service to approximately 600 acres in one-third of the city. The North Outfall discharged into an open ditch about 700 feet west of

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[10] Utah, State Department of Health, Code of Waste Disposal Regulations, Part III, Sewers and Wastewater Treatment Works, 1954, revised May 18, 1965 (Salt Lake City, Utah), p. 1.

[11] Ibid.

Sixth West Street between Second North Street and Third North Street. The South Outfall discharged into an open ditch on the north side of Second South Street several hundred feet west of Sixth West Street.[12]

Many of the sewers in the older section of town on First through Fifth North Streets were constructed in the early 1900's and the 24-inch trunk line of the old North Outfall system was constructed in 1939. The Island System was constructed around 1924.[13]

Excessive amounts of non-sewage flow into systems such as those described above are common, because of the general deficiency of workmanship and materials during these early construction periods. This non-sewage flow entered the system through faulty joints, broken pipes and faulty side sewer connections. All three conditions existed in the Logan system. Excessive infiltration had reduced the net sewage-carrying capacity of the system, also causing pollution of otherwise unpolluted groundwater which entered the system through infiltration.[14]

The water bearing, alluvial gravel nature of the area traversed by the Logan Island system influenced the infiltration problem. Periods of high infiltration correlated with periods of high groundwater, such as the beginning of the irrigation season in the vicinity. Indications were that corrective measures would probably need to be applied over most of the existing Island system to reduce leakage significantly, since the sources of leakage indicated an over-all

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[12] Cornell, Howland, Hayes, and Merryfield, "Engineering Report on Sewage Collection and Facilities for the City of Logan," p. 5.

[13] Ibid.

[14] Ibid., pp. 5-7.

problem instead of isolated major sources.[15]

Another source of water usually not intended to enter sewer systems is surface or storm water, including water from roof and foundation drains, leaking or perforated manhold covers, and interconnection between storm and sanitary sewer systems. Engineering studies disclosed that very little surface water enters the system through manhole covers or by means of interconnections, but that foundation drains were probably a major source of surface and subsurface water entrance into the system.[16]

Another problem was that of exfiltration, which occurs in the same pipe section subject to infiltration when the groundwater falls below the level of the flow in a sewer. Exfiltration allows solids in the sewage to settle out and become lodged in the pipe because of the loss of transporting liquid. These solids provide a breeding ground for rodents and can also decompose, giving rise to offensive and potentially explosive gasses. In extreme cases, they can cause complete stoppages if not periodically removed.[17]

Area service problems

With respect to sewer service for the city, five problem areas became increasingly significant (see Figure 1). In the Island area, development of properties, especially the Thrushwood area east of the Logan River, had been rapid, and the capacity of the existing system was not sufficient to handle such increased loads.[18]

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[15] Ibid., pp. 8 and 9.

[16] Ibid., p. 7.

[17] Ibid., p. 8.

[18] Ibid., p. 20.

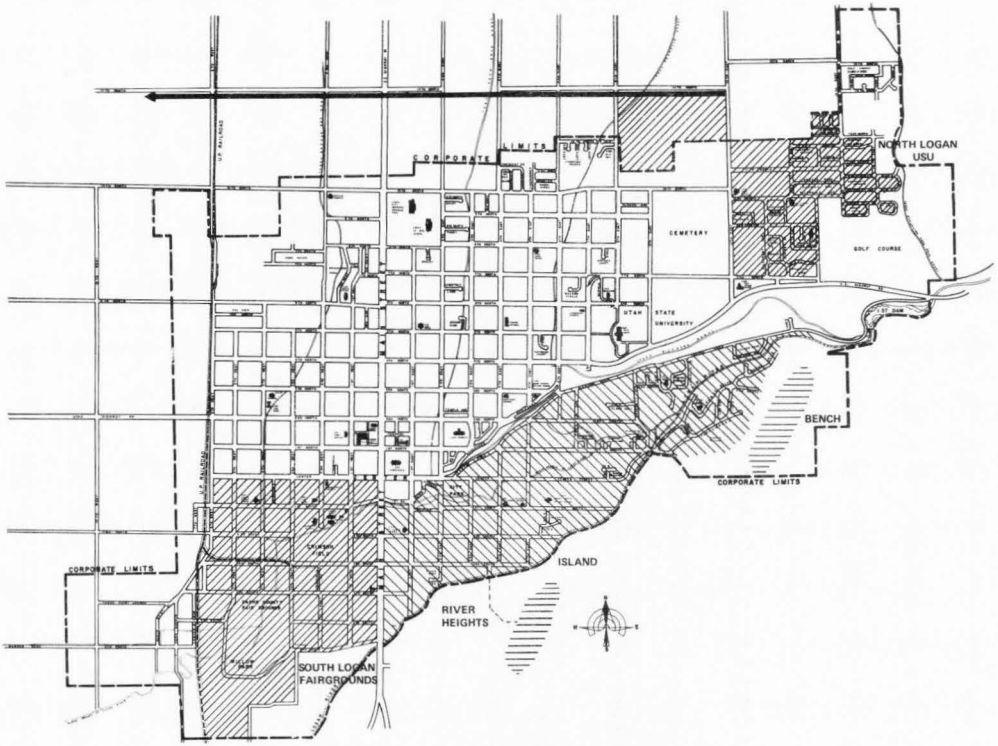

Figure 1. City of Logan showing sewer service areas

The recently-incorporated Bench area, southeast of the city was also developing, but had no sewer service provided by the city. If service was to be provided to aid in development of the area, it would also connect to the Island Outfall. New homes had also been built in the south Logan-county fairgrounds area which had not been provided with sewer service. This area lies lower than the service area of the Island Outfall system and a new sewer trunk would be required for adequate service.[19]

A fourth problem area enclosed the north Logan-Utah State University section, which was not provided with sewer service, with the exception of a small section in the northeast corner where rapid development had caused sewer service to be provided by means of an underground pumping station which pumped sewage to the old North Outfall system. A new trunk sewer would be needed here and would extend north of the present city limits. Expansion of this area was anticipated for private homes as well as housing for USU students.[20]

River Heights City, southeast of the Logan River was not served by the city sewer system, since it lay outside city limits. However, it had recently developed, and engineering studies indicated that expansion of the South Logan sewer system should not be planned without also considering this area.[21]

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[19] Ibid.

[20] Ibid., p. 21

[21] Ibid.

Importance of Measuring Sewage Strength

Laws of the state of Utah demand that the strength of sewage treatment facility effluent be measured before entering state waters. This assures that such discharge into these waters does not alter the standards of purity and use applied to streams and lakes by the WPCB.

Domestic sewage strength is practically the same in each city provided infiltration rates are normal. Industrial wastes, such as those from canneries, packing houses and creameries, increase the strength of domestic wastes. Two principal tests which measure sewage strength are suspended solids and biochemical oxygen demand (BOD).[22]

Both are measured and expressed in parts per million (ppm). BOD estimates are especially important since they reveal how much oxygen will have to be supplied to stabilize the sewage by action of aerobic bacteria (bacteria which require dissolved oxygen for their life processes). Where streams are sluggish or slow, such as the Bear River at Logan, a higher degree of treatment is necessary because the receiving stream does not provide all the oxygen necessary for the activities of these bacteria. Anaerobic decomposition, which occurs when oxygen is insufficient, creates undesirable stream conditions. If these conditions persist, fish and other oxygen-requiring biota perish.[23]

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[22] Ibid., pp. 56 and 57.

[23] Ibid.

The large volume of infiltration at Logan dilutes the sewage strength, but does not decrease total sewage to be treated. Estimates of suspended solids content and BOD loads are usually made prior to design of sewage facilities, since the plant units are sized on the basis of flow and of BOD and suspended solids loads.[24]

Although sewage treatment plants can remove more than 90 percent of all bacteria in sewage and higher percentages of pathogenic bacteria, these removals are not always sufficient to safeguard receiving streams. In these cases, disinfection, usually by chlorination, of treated sewage effluent is often required. Bacteria of intestinal origin which is found in raw sewage may be highly pathogenic and could contaminate a stream enough to make it unfit for useful purposes many miles downstream.[25]

Classification of State Waters

Final limits for the amount of bacterial content of Utah's waters used for different purposes were set forth in a 1955 publication of the WPCB, The Standards of Quality and the Regulations for Water Classification. Class "C" waters, such as those of the Bear River were to be

> . . . so protected against pollution as to be suitable at all times for domestic water supplies which are treated before use by coagulation, sedimentation, filtration, and disinfection. Class "C" waters shall be suitable without treatment for irrigation, stock watering, fish and wildlife propogation, recreation

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[24] Ibid.

[25] Ibid.

(except swimming), as a source for industrial supplies, and for other uses, as may be determined by the Board.[26]

The discharge of wastes into Class "C" waters was prohibited if such discharge resulted in: chemical characteristics of the waters exceeding limits prescribed by U.S. Public Health Service, "Drinking Water Standards" in February, 1946;[27] chemical characteristics of the waters exceeding recommendations for irrigation water quality as outlined in U.S. Department of Agriculture, Handbook No. 60, issued in February, 1954;[28] a monthly arithmetical average "most probable number" (MPN) of coliform organisms[29] in said waters exceeding 5,000 per 100 milliliters; monthly MPN's of coliform organisms approximating this number; monthly arithmetical average BOD in said waters exceeding five parts per million; monthly BOD measurements in excess of the above amount; a BOD exceeding 10 parts per million in more than five percent of samples collected; any slicks, floating solids, suspended solids or sludge deposits in said waters which are readily visible, or an appreciable change in color of said waters, or

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[26]Utah, State Water Pollution Control Board, The Standards of Quality and the Regulations for Water Classification (Salt Lake City, Utah, February 24, 1955), p. 2.

[27]U.S., Public Health Service, "Drinking Water Standards," Public Health Reports, Vol. 61, part 1 (Washington, D.C.: U. S. Government Printing Office, February 6, 1946), p. 371, quoted in Utah, State Water Pollution Control Board, The Standards of Quality and the Regulations for Water Classification (Salt Lake City, Utah, February 24, 1955), pp. 2 and 3.

[28]U.S., Department of Agriculture, Handbook No. 60 (Washington, D.C.: U.S. Government Printing Office, February, 1954), quoted in Utah, State Water Pollution Control Board, The Standards of Quality and the Regulations for Water Classification (Salt Lake City, Utah, February 24, 1955), pp. 2 and 3.

[29]Coliform organisms are bacteria from the fecie of warm-blooded animals.

a pH (measure of alkalinity and acidity in waters) of said waters lower than 5.0 or greater than 9.0; the presence of any toxic wastes, phenols, or other deleterious substances in such concentrations or at such temperatures as will render said waters injurious to fish life and waterfowl or unsafe or unsuitable as sources of water supply for domestic use, food processing or industrial use, or unsuitable for agricultural purposes, stock watering, or recreation (except swimming).[30]

The "Standards" were modified September 7, 1960, by an amendment which stated that the Board may assign any one of the classifications, A, B, C, D, or E, to a given water notwithstanding the presence in the water of natural pollutants in excess of limits established by the classification, in which case the subscript "1" is added to the usual classification designation. No change in waste discharge restriction of the basic classification was to be inferred, except that the discharge of any wastes in such a way as to increase the concentration of any of the excessive natural pollutants in the classified water was prohibited. The amendment also provided that wastes discharged to waters of the state under limitations imposed by a given classification were to be further controlled as required to protect water quality designated by all downstream classifications.[31]

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[30]Utah, State Water Pollution Control Board, The Standards of Quality and the Regulations for Water Classification, pp. 2 and 3.

[31]Ibid., p. 4.

PROCESS OF LOCAL GOVERNMENT:

TWO SEWER BOND ELECTIONS

Initiators

The quest for improvements in the Island sewer system began as residential expansion increased the level of groundwater in the area and heightened property damage potential.

In January, 1955, H. Merrill "Bud" Peterson, Lynn Skabelund, and Rulon Hansen, residents of the southeast section, attended a City Commission meeting to ask Mayor William W. Owens and Commissioners Ben W. Evans and J. Vernon Cook what progress had been made in connection with plans for a proposed sewer main extension to their section. Property owners in the Island area had recently petitioned the city for such an extension, and a study of water problems was being made by Dr. Alvin Bishop, USU irrigation engineer, and Professor Eldon Stock.[1]

By September the Commission informed Skabelund, who acted as spokesman for several property owners on the Island, that practically all plans had been completed in connection with the sewer extension, but that additional groundwater tests would be necessary before these plans could be submitted to the WPCB.[2]

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[1] City of Logan, Minute Record, Board of Commissioners, Book L, meeting of January 11, 1955.

[2] Ibid., meeting of September 6, 1955.

J. L. Montrose, businessman who later became an active proponent of lagooning, ran unsuccessfully against Cook for a seat on the City Commission during the November municipal elections. H. R. Pederson was elected auditor.

Peterson, Skabelund, Hansen and George D. Preston continued to follow progress on the proposed Island sewer extension the following year. They talked with project engineers, Dr. Bishop and Professor Stock, and attended Commission meetings to emphasize the need for improvements in their neighborhood.

Late that same summer, the engineers notified the Commission that they were unable to continue with their work. Stock had moved from the city and Dr. Bishop was on leave of absence from the University for service in Japan for the ensuing four months. Commissioner Evans was authorized to hire other engineers to continue a study of problems in the Island area, and he employed a Salt Lake consulting engineering firm, Templeton and Linke. They were to determine the feasibility of eliminating underground water infiltration from the Island sewer system. Mayor Owens and the two commissioners agreed that the city should also consider preparation of plans and specifications for a sewage treatment plant for Logan.[3]

By November City Engineer Ray Hugie had been authorized to work with the WPCB in preparing an application for federal funds for the proposed construction of a treatment plant. Accordingly, Peterson and other citizens from the southeast section were informed that the

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[3] Ibid., meetings of January 31, August 7, and August 21, 1956.

city expected a preliminary report within six weeks from project engineer, Win Templeton, on the cost of improving the Island system and providing the city with a mechanical treatment plant.[4]

The Cache Chamber of Commerce committee

In 1956 the Cache Chamber of Commerce became involved in a campaign to clean up industrial waste in the valley. Secretary-manager Dean Smith appointed a Sewage and Sanitation Committee to coordinate plans for an educative program on the causes of pollution. Merrill Peterson was asked to head the group.

Peterson was the local dealer for Caterpillar equipment and machinery, and had seen slides on pollution which were distributed by the company and by the United States Public Health Service. As a sportsman, who for several years had been concerned about the detrimental effects of stream and lake pollution to fish and wild fowl, Peterson was deeply interested in anti-pollution measures. He had written several articles on the subject and some were published in The Herald Journal.[5]

Other residents who expressed an interest in the drive were recruited to the committee. Among those who actively supported the campaign were: Dr. Merrill Daines, physician; Dr. Bruce Watkins, Professor of Electrical Engineering at USU; Lynn Skabelund, building contractor; Rulon Hanson, paint contractor; Irwin Moser, county surveyor; Commissioner Evans; Curtis Calderwood, local attorney; Norman Daines, businessman; Dr. William Sigler, of the USU Wildlife

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[4] Ibid., meetings of November 20 and December 18, 1956.

[5] H. Merrill Peterson, personal interview in Logan, Utah, June, 1968.

Resources Department and later chairman of the WPCB; and Dr. Reed Roberts, then state sanitarian and later Assistant Professor of Zoology at USU.[6]

The committee retained Max Brunson, local photographer, to produce films showing the results of wastes being dumped into streams in the valley by industries and towns. As evidence of pollution, the films were irrefutable. Pictured were the blood-red streams which received refuse from meat packing plants, ditches and streams infested with rodents and insects thriving on city waste, and waterways laden with discharge from industrial plants and towns along the Bear River and its tributaries.[7]

Peterson estimated that some eight to ten thousand persons saw the films as the committee contacted schools, civic groups, sportsmen's organizations, city officials, and church groups to present this dramatic illustration of existing conditions. Newspaper articles reported committee activity and expanded the campaign with additional information. The Logan Junior Chamber of Commerce provided assistance. Residents of the Island and College Hill areas encouraged committee efforts by contacting neighbors and friends.[8]

There is general agreement that the committee's drive was highly effective as an eye-opener. However, the promotion of all-out anti-pollution measures became an unpopular cause with many citizens. Peterson recalled that business associates and neighbors made wisecracks

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[6] Dean Smith, personal interview in Logan, Utah, July, 1968.

[7] Peterson, interview.

[8] Ibid.

about the campaign, and some businessmen declared that they would not buy from him anymore. Peterson declined naming names, but said opposition came from bankers, businessmen, motel and apartment house owners, and others who were afraid it would cost them too much money to support an extensive clean-up project. He noted that some opponents later profited financially from construction of the city's sewage treatment facility, and also that one individual, who was later elected to city government, fought any type of sewage treatment facility at this early date, but later took credit as having fought for such measures. Peterson also felt that he lacked full support from the Chamber's board of directors, even though the drive had become Chamber policy.[9]

Dr. Roberts worked closely with Peterson, providing technical advice and supplying additional information. The committee disseminated information gathered from USPHS bulletins, other government publications, and technical journals. Dr. Roberts and Peterson showed pictures of a trench where the kill from a chicken farm had been dumped over a period of years without having been cleaned or covered up to Dr. R. O. Porter, local physician and State Department of Health official. Dr. Porter confronted city officials with pictures of the scene and demanded action on a sanitary landfill for the city. Officials and citizens visited the site to view the heaped chicken carcasses.[10]

The anti-pollution drive now concentrated on a comprehensive program, including sewage treatment and a sanitary landfill. Proponents,

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[9] Ibid.

[10] Ibid.

especially Peterson, pushed the campaign enthusiastically. Perhaps too energetically, commented Smith, who thought that such a hard and fast drive for drastic changes alienated people in the community, especially businessmen.[11]

Dr. Roberts felt that committee perserverance eventually convinced most persons in the community to back the campaign, but that "the leaders" were not behind it. Some businessmen, older citizens, and local administrators, who often called attention to the progressiveness of the community and the comparatively high level of education among Logan's citizens, preferred to ignore the fact that city waste lay exposed in an open ditch close to town.[12]

As a state sanitarian, Dr. Roberts was deeply involved in the problem of pollution. As a zoologist, he was concerned about the potential dangers involved in lagooning as a method of waste treatment. Without proper management weeds could grow in the ponds affording insects a breeding ground, and unless steps are taken to prevent odors, ponds can become offensive. Dr. Roberts was interviewed for this study several months after Logan's sewage lagoons became operable and he still expressed a preference for enclosed treatment facilities, but withheld criticism of the alternative method unless a longer period of operation and testing disclosed inadequacies.[13]

Both Dr. Roberts and Peterson had confidence in the professional judgment of Lynn Thatcher, chief sanitary engineering officer of the

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[11] Smith, interview.

[12] Dr. Reed S. Roberts, personal interview in Logan, Utah, September, 1968.

[13] Ibid.

State of Utah and Executive-secretary of the WPCB, who was a proponent of waste treatment by the mechanical plant process. Thatcher's hometown is Logan, and he received his baccalaureate degree in engineering at USU.

Bond Issue Proposal, 1957

The Sewage and Sanitation Committee continued the campaign in 1957. During an April City Commission meeting Peterson, Skabelund and Preston presented a letter signed by presidents of the Cache Chamber of Commerce, the Logan Jaycees, and by Peterson as committee chairman, requesting that plans for financing of a sewage disposal system include money to cover the cost of equipment needed to operate a sanitary landfill.[14]

Appearing at the same meeting on behalf of the Logan Cow Pasture Association were Merlin Eliason and Eugene Stewart, who wanted to know what effect the construction of a sewage disposal plant would have on their use of irrigation water from the sewer outfall.[15]

Farmers whose land lay below the sloughs into which sewage was discharged, had, for many years, used slough water for irrigation and stock watering purposes. Crops raised in this section of the valley included hay, grains, and some garden produce and fruit. Livestock herds are raised primarily for beef and dairy products.

Peterson and Skabelund were informed by the commission in July that their perition for forming an Island Sewer District did not have

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[14] City of Logan, meeting of April 23, 1957.

[15] Ibid.

the required number of signatures of property owners whose land abutted the proposed district. However, the city had filed with the WPCB a request to provide a primary sewage treatment plant[16] to be so constructed that secondary facilities, plus a trunk line to the Island, could be added later.[17]

Total cost of the facilities was estimated to be $1,400,000, less federal aid of about $250,000. Financial arrangements included repayment of the bonds, interest, and operation costs through revenue from a three-mill property tax levy, and a minimum $2.00 monthly service charge.[18]

An ordinance providing for an October 8 special election, and declaring an emergency situation in the city, was passed by the City Commission August 27th. The proposal called for issuance of $1,000,000 in sewer improvement bonds.[19]

A Herald Journal article on September 11th indicates that there was some misunderstanding concerning the purpose of issuing these bonds. The news story explained that the proposed project would not be a sewer system for the Island area, but would provide a larger sewer main extending from that area to the new plant, which would serve the entire city.[20]

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[16] Ernest W. Steel notes in Water Supply and Sewerage (3rd ed.; New York: McGraw-Hill, 1953), p. 418, that when a plant gives only primary treatment, it decreases the BOD in receiving streams, but the effluent is said to be only partially treated. When secondary treatment is provided, sewage is frequently designated as completely treated, although this may be far from the case.

[17] City of Logan, meeting of July 2, 1957.

[18] Ibid., meeting of July 16, 1957.

[19] Ibid., meeting of August 27, 1957.

[20] Herald Journal (Logan, Utah), September 11, 1957, p. 1.

The Herald Journal also published notice of weekly Tuesday evening meetings which the Commission had set so citizens could ask questions which would clear up any misunderstanding concerning the project and its financing. Another news article explained that Logan was to receive the $250,000 federal grant under Public Law 660.[21]

Mayor Owens spoke to local groups on adoption of the bond issue, and stressed the necessity of action in the interest of public health. He also reminded citizens that the WPCB had demanded action from the community, and pointed out that such improvement would help Logan's growth, especially in areas where no sewer system was provided and could not be provided under WPCB rulings until a new plant was constructed.[22]

Early in October, The Herald Journal noted that opposition to the proposal for a plant had grown in the past few weeks in spite of its endorsement by several groups, including the Jaycees, and the local chairman of Utah's Commission on Industrial and Employment Planning, Bob Welch, and in spite of newspaper publicity emphasizing the imperativeness of heeding WPCB orders.[23]

On October 9th the local newspaper announced in a banner headline, "City Rejects Sewer Bond." The issue had been turned down by almost a two-to-one vote, with 888 in favor and 1530 opposed, out of 7,288 registered voters. The only two voting districts favoring the plan were the College Hill and Island areas. Editor Ray Nelson's story

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[21] Ibid., September 17, 1957, p. 1.

[22] Ibid., September 25, 1957, p. 1.

[23] Ibid., October 3, 6, and 7, 1957, p. 1.

explained that opponents of the issue thought it financially unwise for the city to plunge into $1,000,000 indebtedness with the added cost of interest, and recommended instead, a pay-as-you-go plan, including possibly a charge on connections now which would accumulate funds for a future treatment plant. Many persons were afraid of the costs of government going higher.[24]

Earl T. Hunsaker was elected mayor of Logan in the November municipal elections. His campaign against E. G. Earl included the promise to work vigorously for civic improvement, including sewer and landfill facilities. Hunsaker was backed by proponents of the defeated bond issue proposal, who had been assured that he intended to promote anti-pollution measures.[25] Newel Winget won election to the City Commission over Sterling Nelson. Commissioner Evans had been defeated in the primaries and Mayor Owens was not in the 1957 race.

During a June, 1958, City Commission meeting Peterson introduced a representative of the USPHS who offered the cost-free services of his agency in a complete sanitation survey of Logan.[26]

Island residents were informed again during the summer that the problem of excessive water in the southeast section must be eliminated before sewer hookup could be provided. Commissioner Cook suggested a three-mill tax levy during 1958-1959 for sewers and drains, which would produce about $60,000 to be used for beginning reconstruction of the Island system, and clearing up infiltration problems. Other

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[24] Ibid., October 9, 1957, p. 1.

[25] Peterson, interview.

[26] City of Logan, meeting of June 3, 1958.

residents, in the northwest part of the city, had offered to donate land and money if construction of sewage facilities for their area could begin.[27]

Conference on Interstate Pollution of Waters, First Session

In response to a request by the Utah Water Pollution Control Board a "Conference on Interstate Pollution of Waters of the Bear River" was called by the Surgeon General of the USPHS for October 8, 1958. The "Conference" concerned Idaho, Wyoming, and Utah, members of an interstate compact (Figure 2, page 30), and was held on the USU campus under the chairmanship of Murray Stein, Chief of Interstate Enforcement on the Water Supply and Water Pollution Control Program of Health, Education and Welfare. Thatcher explained that the meeting had been called primarily because individuals and civic organizations in Utah had demanded action from the WPCB. Invitees from Utah included Peterson, Dr. Bishop, and Preston. Commissioner Winget also attended.

On the basis of joint state-federal studies of water quality and industrial waste characteristics it was reported that raw sewage and inadequately treated municipal and industrial wastes were degrading the water quality of Worm Creek and the Cub River, tributaries to the Bear River, and also the Bear River, so that water in the Bear River was inferior to Utah's Class "C" designation. An increase of coliform count above the mouth of the Little Bear River and Cutler Reservoir

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[27] Ibid., meetings of June 3 and 17, 1958.

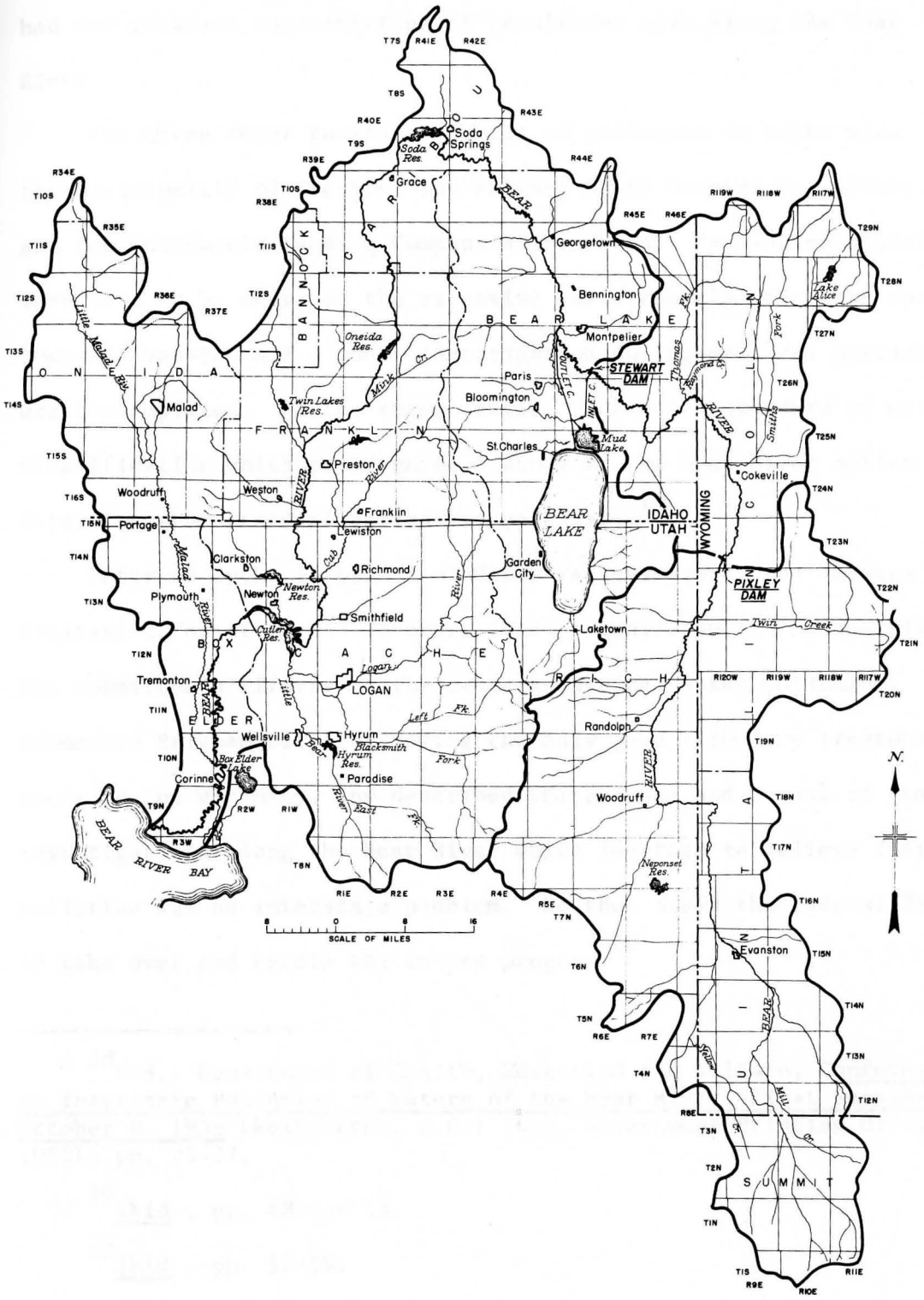

Figure 2. Bear River Basin showing compact divisions

indicated what effect Logan's sewage may have had.[28] Cache Valley had the greatest concentration of population area along the Bear River.

The three major possible sources of pollution in Idaho were the municipality of Preston, the Whitney Sugar Company at Whitney, and the California Packing Company at Franklin. Wyoming authorities were said to be aware of the excessive waste contribution near the town of Evanston and a short investigation during critical periods was contemplated. Of the three states, Utah had a standard of water classification which could guide a study of the Bear River system to determine what remedial action was necessary.[29]

Peterson spoke in behalf of Cache Valley mayors, the Sewage and Sanitation Committee and 28 other local organizations. He described the committee's efforts in the campaign against water pollution, commended Brigham City for having the only good secondary treatment plant in the vicinity, and described the purpose and extent of committee investigations along the Bear River which led them to believe that pollution was an interstate problem. He then asked the federal PHS to take over and handle the entire program.[30]

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[28] U.S., Department of Health, Education and Welfare, Conference on Interstate Pollution of Waters of the Bear River, First Session, October 8, 1958 (Washington, D.C.: U.S. Government Printing Office, 1958), pp. 23-27.

[29] Ibid., pp. 68 and 69.

[30] Ibid., pp. 57-59.

Stein said he realized that "everyone is giving lip-service to anti-pollution. Everyone is against sin." However, PHS was in the delicate position of maintaining good federal-state relationships, and, since it is primarily the responsibility of the states to police waters within their boundaries, PHS would rather give them every opportunity to act on their own.[31]

Commenting on legal aspects and the constitutionally reserved powers of the states, Preston asked the other state representatives to describe what, if any, state laws Idaho and Wyoming had which would compare with Utah's statutory control of water pollution. Wyoming's Advisory Council on water pollution advised entirely, and the matter of prosecution was left to that state's Health Department. Idaho law did not permit a state agency to take any action against industries except that which is recommendatory, and Idaho's Health Department could take action against an offending industry if a health hazard had been created.[32]

Preston challenged the effectiveness of these non-comprehensive state laws. He also noted that, although Utah authorities did have a legal basis to prosecute in cases of water pollution, no cases had been prosecuted, even after evidence (the Sewage and Sanitation Committee films) had been presented. He decried "paternal government," and thought that if a few offenders were touched with criminal prosecution, the local situation might be handled on a local basis.[33]

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[31] Ibid., pp. 60 and 61.

[32] Ibid., pp. 62 and 63.

[33] Ibid., pp. 63-66.

Referring to problems close to home, Preston declared that he didn't think the sugar beet industry was worth keeping if it could only be kept at the expense of stream pollution, although, ". . . my compatriots in the banking business would not agree with me."[34]

R. H. Cottrell, a representative of the Amalgamated Sugar Factory at Lewiston, Utah, said that if his factory were to clean up its effluent to a suggested 90 percent, the plant would be forced to close down, thus taking out of circulation in the valley an estimated million and a quarter to a million and three quarter dollars per year. The 90 percent clean-up would involve installation of a plant which would handle the population equivalent of a city of 350,000.[35]

In summarizing the proceedings, Stein emphasized the "hands off doctrine" of the federal government, but offered PHS technical and financial assistance to Utah to alleviate a shortage of funds and personnel so the WPCB could pursue a study and analyze data relevant to remedial measures. The state, in turn, indicated that such a study would result in action. Thatcher estimated that one year would be necessary for the study, plus about three months for analysis and development of a classification procedure for the Utah-Idaho area. A second conference would be set to hear results of the study and of Wyoming's action on the problem near Evanston.[36]

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[34] Ibid., pp. 63 and 64.

[35] Ibid., pp. 46 and 47.

[36] Ibid., pp. 68-76.

Alternative Raises Legal Question

In February, 1959, George Bohart, spokesman for a citizens' committee from the southeast section, was assured by the Logan City Commission that the city was concerned with the problem of providing sewer extensions to the area, but that the WPCB maintained its ruling against adding new sewer districts to the city system until an adequate disposal plant was provided. During the spring and summer, Bohart, Preston, Peterson, Jack Laub, and Richard Lamb helped to circulate a petition to form a sewer district in the Island area. By April it was reported that over 51 percent of property owners concerned had signed the petition, and the city engineer's office was authorized to prepare plans and specifications. An "anti-sewer district" petition was presented, but a tabulation of protests indicated that only about five percent of property owners affected were in opposition.[37]

Prior to municipal elections in 1959, the "Your Opinion" column of The Herald Journal published a letter signed by the chairman of the Cache Chamber of Commerce Sanitation Committee and the Sanitation Committee chairman of the Logan Jaycees, Dr. Paul R. Stowell, concerning recent efforts by some individuals in promoting waste stabilization ponds for Logan.

The letter described the "open bayou" type disposal system as a money-saving measure, but one which would require too much land and would not answer the problem of odor nor enhance the area. Other

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[37]City of Logan, meetings of February 17, March 10, April 21, May 19, September 15, 1959.

methods, such as chemical treatment, were also said to be wishful thinking, and citizens were urged to consider plans for financing the much-needed secondary sewage disposal system which could be afforded by the approved mechanical plant.[38]

In the November 3rd municipal elections, Richard A. Chambers defeated Reid Wangsgaard for a City Commission seat. Both candidates, in answer to questions on civic issues, had expressed their intention to work for adequate sewage treatment facilities.[39]

About this same time, there were indications that some areas, including Logan, were becoming aware of the possibility of constructing lagoon sites at less expense than that connected with construction and operation of the conventional treatment plant. The Utah Municipal League became actively interested in the question of control by the WPCB on design and construction of a city's treatment plant in October, 1959, when the city of Blanding sought to construct a lagoon treatment system and was informed by the Board that the proposed site did not meet standards. After being contacted by the city, Municipal League counsel, A. M. Ferro, prepared a letter to the state's attorney general with reference to the scope of authority of the Board, especially in relation to situations where discharge from treatment plants did not directly enter state waters.[40]

In February, 1960, Utah Attorney General, Walter L. Budge ruled that the Board did not have power to regulate or prohibit construction

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[38] Herald Journal, November 1, 1959, p. 13.

[39] Ibid., October 30, 1959, p. 9.

[40] A. M. Ferro, Counsel to Utah Municipal League, letter to author, August 16, 1968.

of sewage treatment plants if the plant was located on property of the municipality, and if there was no discharge of effluents from the plant into water or upon lands not contained within the treatment plant enclosure.[41] Effluent from the lagoons eventually constructed at Logan does flow into state waters.

Attorney Ferro and Tom McCoy, League director, contacted the Board to discuss state regulation of treatment facilities contained entirely upon city property, and concluded that members thought they had the power to pass upon this point as a means of avoiding growth of plants which might lead to future contamination of state waters. The Municipal League's position was that the act which created the WPCB did not grant that body power to intervene in such a broad sense in city affairs, and that such a grant of power would be in violation of the state's constitutional provision that the legislature could not interfere with any municipal improvement or to perform any municipal functions.[42]

In order to resolve the question, the League prepared Senate Bill 198, which would have defined the scope of authority of the Board. The bill was subsequently introduced to the state legislature, but its enacting clause was deleted since a compromise had been reached, and by 1963 a new set of rules and regulations started to develop.[43]

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[41] Ibid.

[42] Ibid. (Refers to Utah Const., art. VI, sec. 29.)

[43] Ibid.

Conference on Interstate Pollution of Waters, Second Session

Following the first session of the "Conference," the WPCB had taken preliminary action to classify the streams involved, and it was anticipated that final action on classification would be taken subsequent to the second session. Preliminary classifications were: Bear River, from the state line to Cutler Dam, Class "C"; below Cutler Dam to Malad River, "C_1"; upper river in vicinity of Wyoming-Utah state line, "C"; Cub River, "D"; Worm Creek, "D"; and the Malad River in Utah, "C_1."[44]

The second session was opened by Stein on the USU campus July 19, 1960, with the introduction of Congressman Henry Dixon, former USU president, who expressed his concern for streams in the Cache Valley area. Stein also introduced Grant W. Midgley, Legislative Assistant to U.S. Senator Frank Moss of Utah, who described the Senator's efforts in behalf of anti-pollution measures on Senate committees and his involvement with the local problem through extensive correspondence with Peterson and other civic leaders.[45]

F. W. Kittrell, sanitary engineer in charge of water pollution evaluation in the Technical Services Branch of PHS located at the Sanitary Engineering Center in Cincinnati, Ohio, presented a comprehensive report on pollution of the interstate waters of the Bear and

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[44]U.S., Department of Health, Education and Welfare, Conference on Interstate Pollution of Waters of the Bear River, Second Session, July 19, 1960 (Washington, D.C.: U.S. Government Printing Office, 1960), pp. 12 and 13.

[45]Ibid., pp. 8-11.

Cub Rivers and of Worm Creek, concluding that such pollution endangered the health and welfare of persons using these waters in Utah.[46]

Thatcher agreed with Stein that the survey presented by Kittrell, added to information gathered by Utah technicians, would provide sufficient data so that the State of Utah could proceed with its committment to classify waters of the Bear River in Utah.[47]

Representatives of Amalgamated Sugar Company described their recently installed waste treatment facilities to conferees, and noted that their plan for handling factory wastes had been submitted to the WPCB, but they had not yet received approval or rejection from the Board.[48]

Peterson reviewed the list of organizations which had continued to pledge support of the Sewage and Sanitation Committee's drive. He told of committee activity and findings, and closed his statement with an expression of concern for the industries of the area, but thought that industries would not be tolerated at the expense of stream pollution.[49]

The remarks of Preston again concentrated on the responsibility of municipalities and public officials in cleaning up their own areas. He summarized the Logan situation to 1960:

> The whole snowball was started by the thunderous voice of Bud Peterson years ago; that is, locally, until it has reached this present stage, and it came about because he had no means of curing a sewerage system in his own back yard, by means of

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[46] Ibid., pp. 12-25.

[47] Ibid., p. 27.

[48] Ibid., pp. 40 and 41.

[49] Ibid., pp. 43-45.

> cesspools and tanks. And from that pressure on Logan City to put a sewer in the south side of the city, has grown this organization /sic/ on which we certainly compliment you people, and hope that it may continue . . .[50]

Preston's hope was for preventive measures in the future, a goal toward which he was certain committee efforts would continue to be directed despite condemnation by groups and individuals whose pocketbook they touched.[51]

Later, during the proceedings, Peterson mentioned a poll which had been taken by the Logan Junior Chamber of Commerce to find out what recreational facilities the city should have. Although sanitation facilities weren't mentioned on a questionnaire, almost 80 percent of those sent out came back with notice of the fact that Logan needed a sewage disposal plant. He attributed defeat of the 1957 bond issue election to a confusion of the facts involved, lack of response from officials locally, and no way to apply pressure from the state level.[52]

In his concluding statement, Stein advised conferees that the USPHS should be able to expect remedial measures to be completed by October, 1961. If this time was not agreeable to the states they were to notify the Surgeon General of the United States within 30 days and make other arrangements.

During the hedging which followed this proposal for a deadline, Thatcher was asked when the WPCB intended to formally classify Utah's waters, and he replied that the state's attorney general had advised

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[50] Ibid., p. 47.

[51] Ibid., pp. 47 and 48.

[52] Ibid., pp. 62-82.

the Board to act in this matter. Stein said he didn't know that the classification necessarily affected municipal planning, such as that needed at Preston, Idaho. Others felt that polluters needed to be aware of stream classification so they could plan to meet these standards.[53]

Preston's opinion was that classification had nothing to do with cleaning up pollution, only with "how much pollution," and that Utah did not need to wait for stream classification before beginning an eradication campaign. He also stated that the state's attorney general had indicated, during a discussion in the hallway, that he would start injunction proceedings in southern Cache County during the week.[54]

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[53] Ibid., pp. 62-67.

[54] Ibid., pp. 68 and 69.

STRATEGY IN CHALLENGING AUTHORITY

Complaint against Industrial Waste

Valley Rendering Company, a food processing corporation located in Hyrum, about eight miles southeast of Logan, was asked by the WPCB in July, 1959, to cease construction of their new plant until facilities for waste treatment had been approved by the Board. The following month, representatives of the company met with the Board and indicated their intent to adopt a new process which met with Board approval.[1]

In September the WPCB began tests on three discharge points from the plant, and subsequently concluded that wastes being emptied into nearby sloughs and then into an irrigation canal contained BOD in excess of amounts allowed for discharge into Class "C" waters. The suspended solids and grease content was also said to be about four times that allowed for untreated domestic sewage, although there was no separate classification for tolerable suspended solids in Class "C" waters. Waters from the company's septic tank disposal system were observed coming to the ground and flowing as surface run-off.[2]

On July 6, 1960, the WPCB ordered cessation of such waste discharge by Valley Rendering. The Board also stated in its "Findings of Fact

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[1] State of Utah v. Valley Rendering Company, Civil Case 9123, File 1960, First Judicial District Court of Utah, Cache County.

[2] Ibid.

and Conclusions of Law," that there were other companies along the Bear River which were polluting the waters of the state with wastes.[3]

Valley Rendering officials stated that they had employed engineers to study adequate facilities, and that the cost of these studies and facilities would be approximately $250,000. As an alternative, they began building a system of re-circulation coupled with spray diffusion which would contain the wastes on Valley Rendering Company property, and made plans to investigate a lagooning system as an alternative solution.[4]

A formal complaint was made July 28th in First Judicial District Court of Cache County by the State of Utah on behalf of the WPCB against Valley Rendering by Attorney General Walter L. Budge. A summons was issued defendants the same day. Attorney for the defendants was Calvin Rampton. Cause of the action by the plaintiff was that the processing company had not complied with the previous order. The state sought to enjoin the defendants from continuing this violation of state law and petitioned the court to set a time for hearing the case and to issue an order to the defendants to show cause why they should not be restrained from dumping wastes into state waters. First District Judge Lewis Jones of Brigham City issued the order and set a hearing before the WPCB in August.[5]

Pursuant to the court order, the Board held a hearing on the matter on August 25th. After entering its "Findings" the Board gave Valley

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[3] Ibid., "Findings."

[4] Ibid., "Conclusions."

[5] Ibid., "Complaint."

Rendering until October 1st to submit engineering plans and other design data covering facilities which would correct the pollution problem, together with a construction schedule outlining when the proposed facilities could be put into operation.[6]

Citizens for Better Government

Defeat of the sewer bond issue in the 1957 special election stimulated the interest of E. L. Hanson, M.D., who retired after 33 years of practice in Logan following a heart attack in 1959. From 1926 to 1936 Dr. Hanson was city physician.[7]

Realizing that his retirement would afford time for a detailed study of anti-pollution methods, Dr. Hanson began to collect data which would substantiate his belief in the efficiency of sewage lagoons as a system of waste treatment. He had read several articles on lagoons pointing up the comparatively low cost of construction and maintenance. He felt that equivalent costs of a mechanical plant were so high that they contributed heavily to defeat of the bond issue.[8]

After Dr. Hanson introduced the idea of lagooning as an alternative solution to the city's problem, the Citizens for Better Government Committee formed to offset efforts of mechanical plant proponents. Members of the committee were: Dr. Hanson, chairman; J. L. Montrose, secretary; Carlos Buchner; Joseph C. Jacobsen; Professor A. J. Morris; Dr. LeGrand Noble; Alton Dahle; Wilhelm Pedersen; W. P. Baugh; Mr. and Mrs. Clifford Jensen; Art Peace; Don Bateson; Ed Banellis; H. Sjostrom; and Ace Raymond.

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[6] Ibid., "Order."

[7] Dr. E. L. Hanson, personal interview in Logan, Utah, July, 1968.

[8] Ibid.

Occupations represented on the committee included owners and managers of local businesses, three contractors, four professional people, the poultry industry, and operators of rental units.

Dr. Hanson said that an important reason for his involvement in the issue of method of treatment was that he felt the WPCB was pointing "the finger of guilt" at several communities, including Logan, for not installing a mechanical plant to correct their pollution problems.[9]

Investigation of an alternative

Much of the information on waste stabilization ponds gathered by Dr. Hanson was published in The Herald Journal, and was presented to local organizations and during public meetings convened for the purpose of considering the ensuing bond issue elections. The material was also relevant to hearings conducted by the WPCB and State Department of Health, and to proceedings in First District Court. This data was also used by the Logan physician when he joined others in recommending changes in existing regulations to the WPCB which were effected in 1965.

Dr. Hanson secured literature on lagoons from sources in the United States, Canada, and other countries. He made field trips to see mechanical plants and lagoons in operation in Idaho and Arizona, two of the 40 states then using both systems of sewage treatment, visited laboratories, and interviewed technical personnel.[10]

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[9] Ibid.

[10] Ibid.

In August, 1960, an international conference on waste stabilization lagoons was held in Kansas City, Missouri. The conference was sponsored by the USPHS in connection with water supply and pollution control through their regional agency. Attending were 330 representatives from 32 states and seven foreign countries. The state of Utah was not listed as having a representative present. Reports from the "Symposium on Waste Stabilization Lagoons" came from sanitary engineers who had engaged in research and gained field experience on oxidation ponds.[11]

Drawing largely from this material, Dr. Hanson prepared his own report on lagoon treatment which he used to answer critics of the efficiency and health and safety aspects of this method.

Among "Symposium" contributors were W. W. Towne, A. F. Bartsch, and W. H. Davis of the Robert A. Taft Sanitary Engineering Center, USPHS, Cincinnati, Ohio; J. G. Shaeffer, Director of Sanitation for the Province of Saskatchewan, Canada; and representatives from health and sanitary departments of the states of South Dakota and Kansas.[12]

Comparative costs of construction, operation, and repair of the two systems were considered. Figures varied according to population, topography, and land prices. Contributors Herbert C. Clare and Daniel J. Weiner declared, in "Economics of Waste Stabilization Lagoons in Region VI," that the use of lagoons depends mainly on the feasibility

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[11] U.S., Public Health Service, Water Supply and Pollution Control Activities, Region VI, Proceedings of Symposium on Waste Stabilization Lagoons at Kansas City, Missouri, August 1-5, 1960 (Washington, D.C.: U.S. Government Printing Office, 1960).

[12] Ibid.

of using available land.[13] Towne and W. B. Horning offered "Some Observations on Growth, Application, and Operation of Raw Sewage Stabilization Ponds," wherein they considered the high per capita cost of conventional plants in small communities or in larger communities with a limited tax base.[14]

Symposium reports supported the belief of lagoon advocates in Logan that this method could provide substantial health protection, would be a suitable habitat for fish and wild fowl, could be constructed so that odors and insect breeding were kept at a minimum, could be designed to provide adequate service over an extended period of time for a community the size of Logan, and would operate efficiently during all seasons.[15]

Dr. Hanson also observed that some mechanical treatment plants in other states and in several Utah towns were not operating efficiently. Installations in Provo, Orem, Brigham City, and the Weber and North Davis plants were producing odors and unsatisfactory effluents. Idaho, Oregon, Washington, and Arizona were said to be experiencing difficulty with plant operation. Plant operators had commented to Dr. Hanson that the problems connected with operation of a complex facility such as a mechanical plant were many, and that the expense potential in case of trouble was great. Dr. Hanson also pointed out that raw, concentrated sewage could be exposed at the outlets of mechanical plants.[16]

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[13] Ibid., p. 73.

[14] Ibid., p. 77.

[15] Hanson, interview.

[16] Ibid.

He was among those who thought that the expense of building and operating a mechanical plant large enough to handle the city sewage plus the tremendous flow of groundwater through the system would be a great financial burden to Logan taxpayers, but that a lagoon system would be acceptable to the people involved if the WPCB would allow such a system.[17]

Committee efforts

Prior to a second bond issue election for a proposed mechanical treatment plant in December, 1962, the Citizens for Better Government Committee waged an educative campaign in behalf of waste stabilization ponds. Open meetings were held where colored slides of the two treatment processes were discussed. Newspaper articles and ads were numerous. Some members did door-to-door canvassing, spoke to local organizations, and contacted professional engineers who were also interested in the possibility of lagooning in Utah.[18]

Protests in a Dilemma

Opinions, explanations

During 1960, three graduate students submitted a Master's thesis to the Department of Political Science at USU entitled, "A Study of Opinions in Logan, Utah on National, International, State and Local Affairs." Residents were asked if they thought Logan should install a sanitary sewage disposal system. Of total persons polled (at all levels of education) 92 percent favored a new sewage plant, five percent

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[17] Ibid.

[18] Ibid.

said "no," and four percent had no opinion. Pollsters concluded that most respondents were not aware of the serious public health hazard which the open ditches presented, but were glad something was being done; however, respondents' comments indicated that expenses should not fall on the small income man.[19]

In a letter to Merrill Peterson, Thatcher explained why lagoons had not been acceptable to the State Department of Health and the WPCB, except as third-stage treatment devices to handle effluents from other plants.[20]

Thatcher reasoned that sewage contains both bacteria and viruses which can cause disease in humans, and that exposing such substances in man's environment would be potentially hazardous. The danger of sewage exposed in lagoons was equated to that of overflowing cesspools and septic tanks. It was pointed out that in one instance a sewage lagoon had been held responsible for an outbreak of infectious hepatitis.[21]

Moreover, Thatcher felt that ponds would not be installed only in isolated places, but throughout the entire population of the state, since it would be unfair to allow municipalities to use such a system of treatment without extending the privilege to subdivisions, motels, restaurants, and similar establishments. He explained that:

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[19]Lawrence George Coates, Orrice Stratford Murdock, and Kenneth Larry Tomlinson, "A Study of Opinions in Logan, Utah on National, International, State and Local Affairs" (unpublished MS thesis, Utah State University Library, Logan, Utah, 1960), pp. 206-208.

[20]Lynn M. Thatcher, letter to H. Merrill Petersen, September 22, 1960.

[21]Ibid.

> The types of mosquitoes most often found breeding in waste stabilization lagoons are Culex species. . . . When mosquitoes do breed in waste stabilization lagoons, they frequently constitute a health hazard, since Culex tarsalis is a vector of both Western and rural St. Louis encephalitis, and Culex quinquefasciatus is a vector of urban St. Louis encephalitis.[22]

The writer noted that the health hazard involved in handling ducks which had frequented ponds was as yet an unanswered question. As to industrial waste, Thatcher explained that lagoons would be acceptable where infectious material is not present, but that each industrial problem would have to be studied individually. He concluded by stating that so far as municipal wastes are concerned, acceptance of lagoons as treatment devices would introduce into the environment a hazard of presently unknown proportions.[23]

Valley Rendering Company v. State of Utah

Early in 1961, Logan attorneys, Charles Olsen, Preston Thomas, and M. C. Harris, representing certain industries in Cache County, met with the City Commission to discuss action of the WPCB in adopting water classification of the Bear River. The attorneys stated that "C" classification, which would be imposed on waste water from the industries they represented was unreasonable and that they intended to appeal such action in First District Court. City Attorney Harvey Sjostrom recommended that the city also appeal.[24]

The March 6th appeal, in which the state board and its individual members were defendants, was made by plaintiffs, Valley Rendering

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[22] Ibid.

[23] Ibid.

[24] City of Logan, meeting of February 28, 1961.

Company, Cache Valley Dairy Association, Logan City, Wellsville City, White Trout Farm, Cache Valley Chinchilla Corporation, E. A. Miller and Sons Packing Company, Inc., Tri-Miller Packing Company, and all other persons, firms, or corporations similarly situated who desired to join.[25]

Grounds for the appeal were that: (1) the February 10, 1961, order of the Board was not based on "Findings of Fact and Conclusions of Law" as required; (2) action of the Board was arbitrary and unreasonable in that it refused to hear applications to postpone the order so parties could prepare evidence to submit; (3) the order was made prior to a hearing and that a subsequent hearing was an "open formality;" (4) the Board failed or refused to disclose at the hearing facts upon which classification was made; (5) notice of the hearing was defective in that it did not inform interested parties of adequate facts concerning the basis of classification and that the Board did not make any findings in support of classification; (6) the statute recited in the order was contrary to the United States and Utah Constitutions in giving unwarranted delegation of legislative powers without adequate or any standards set up by the State Legislature; (7) the statute would take property without due process, or if it did provide due process, the Board's interpretation of the statute takes due process anyhow; (8) said statute and amended order were unconstitutionally vague in requiring approved treatment facilities, vague also in ordering plaintiffs to do certain acts and produce certain evidence in the Bear River; (9) the

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[25]Valley Rendering Company v. State of Utah, Civil Case 9282, File 1961, First Judicial District Court of Utah, Cache County, "Appeal."

order was arbitrary, confiscatory, discriminatory and an abuse of WPCB authority in disregarding legitimate interests and property rights of plaintiffs, setting prohibitively high requirements, setting standards without reference to alleged pollution occurring in the various streams involved, setting standards of purity so high there was no known way to treat discharge adequately, placing more than one classification on one stream without reason or basis for the difference, placing different classification on different tributaries without basis, using the catch-all classification, "all other portions or tributaries to the Bear River in Utah," which shows there was no evidence or facts in regards to particular sources of waste involved, applying the classification only to Utah water, not considering respective waste entrances nor comparative amounts of waste from different sources, requiring blanket action by all parties to correct treatment facilities without evidence that all should do so, and by being only an order of one or two members of the Board who attended the hearing.[26]

Answer to appeal

The Attorney General's answer to attorneys for plaintiffs in the appeal action stated that: the order was not based on formal written findings because they are not required by law; that no additional time had been granted after a November 23, 1960, meeting in Logan when the rationale for water classification was discussed; that no formal written findings were issued prior to the issuance of the amended order because they were not required; that the notice

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[26] Ibid.

contained no facts on the basis of classification, because said notice cannot contain all that information; that all bodies concerned may not have to take remedial action; and that the amended order does not require blanket action.[27]

The answer denied all other allegations stated in the appeal, except to say that classification did apply only to Utah water and that four Board members were present at the classification meeting and that a verbatim transcript was reviewed by all members of the Board. The Attorney General stated that full and valid reasons did exist for different classification on one stream and on different tributaries.[28]

A March 10th amended complaint and petition from the Attorney General's office said the processors did not obey the order. Consequently, in August an injunction was sought. A hearing had been held August 25th and additional investigation of the waters in question had been made. Valley Rendering was then charged with being guilty of polluting state waters and a clean-up date set. The company was accused of using delaying tactics. They were to be enjoined from continuing pollution in the interests of the people of Utah.[29]

The petition declared that all administrative means had been exhausted, and plaintiff was petitioning the court to order the processing people to appear and show cause why the enjoining order

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[27] Ibid., "Answer."

[28] Ibid.

[29] Ibid., "Order."

should not be made. A letter to Judge Jones from the Attorney General's office asked that a hearing date be set, and suggested that this hearing be separate from the water classification appeal by Valley Rendering and others, because the matter (of pollution) had arisen prior to classification of state waters and was based on a different fact situation. A new order was issued and an April 18th court session was set.[30]

On April 18th Judge Jones continued the appeal until May 22nd. Valley Rendering was granted another month to submit plans to the Board. The Board was to take until June 20th to reject or accept the plans, and, if rejected, the matter of whether or not there had been compliance with the order would be decided in district court.[31]

Accordingly, the WPCB reviewed plans, specifications and a timetable for construction of facilities which would treat sewage discharge from the processing plant and accepted these plans. The case was continued without date.[32]

Stream classification hearing

On August 14, 1961, the matter of stream classification of waters in one county was heard by Judge Jones. The State of Utah presented their "Findings of Fact and Conclusions of Law," and the court ordered plaintiffs to submit plans for treatment facilities

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[30] Ibid., "Petition."

[31] First Judicial District Court of Utah, Cache County, Valley Rendering Company v. State of Utah, Civil Case 9282, Minute Book 30, April 18, 1961, p. 322.

[32] Ibid., p. 358.

by November 1st, and set a November 14th pretrial hearing date. Clarence J. Frost, attorney for the defense, stated that he had delivered copies of the "Findings" to Logan attorneys.[33]

These "Findings" were that pollution was creating a health hazard when waters were used for irrigation and stock watering, and that deterioration of the waters interferes with wildlife and aquatic life as well as with the use of Cache River Basin as a recreational site. Pollution also makes the streams unsuitable as a water supply. The waters in question could be defined as waters of the state under UCA, 73-14-2(b) and may be classified under code 73-14-6 to protect the public interest. Multiple classification was found to be necessary because of the different problems in different areas of the state.[34]

By October Cache Valley Dairy Association had submitted a report of plans for waste stabilization lagoons on the property of Manager Gossner. The following month, Melvin Archibald, Mayor of Wellsville City, and City Attorney M. C. Harris told the court that they had consulted with engineers and other technical personnel seeking to determine if sewage outlets from Wellsville reach the Bear River in such quantity as to contribute to pollution, at which time of year Wellsville's outflow reaches the river, and which tests were made below the confluence of Little Bear River and Bear River.[35]

Wellsville officials contended that the costs of a sewage treatment plant which would adequately answer their needs would be prohibitively

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[33]Valley Rendering Company v. State of Utah, "Order."

[34]Ibid., "Findings."

[35]Ibid., "Answer, Cache Dairy Association."

high, for the city had no such funds. The total debt limit of the city was $80,055, and Wellsville had debts of $40,000. They also felt that a bond election would not pass, in part, because 120 of the 320 homes within the city would be connected to the sewer and the proportionate costs would be too heavy. Wellsville would comply with WPCB rulings if a way to legally do so could be found.[36]

Logan City officials had asked for an extension of the November 1st deadline because the city was not budgeted to hire experts to make necessary studies, and because even that would take an extra three to six months.[37]

After the pretrial hearing, Judge Jones ordered the matter continued to January 8, 1962, on condition that the two cities set up suitable amounts in their budgets to do something about their pollution problems. The judge emphasized that "it is immaterial to the court what type of operation is decided upon."[38]

Logan officials attending the hearing were newly-elected Mayor Theral Bishop and Commissioners Ross Covington and Richard Chambers. WPCB members in attendance were Thatcher, Dr. Sigler, Professor Grant Borg, Ezra Fjelsted and Welby Young. The Board repeated that their classification of streams applied only to streams and not to plant effluents, and that only the State Legislature could change water classification once it is fixed.[39]

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[36] Ibid., "Answer, Wellsville City."

[37] Ibid., "Request, Logan City."

[38] Herald Journal, November 13, 1961, p. 1.

[39] Ibid.

By August, 1962, the case of Logan City v. the Water Pollution Control Board had been continued to December 10th. In December a trial date was set for some firms accused of polluting state waters, but intervening events caused the trial date for Logan City to be continued without date.[40]

WPCB special meeting, 1961

A special meeting of the WPCB, March 2, 1961, in Salt Lake City, was called for the purpose of discussing sewage lagoons. Dr. Sigler, Chairman of the Board, emphasized that the meeting was not a hearing, but was to be a presentation of information on lagoons.[41]

Attending from Logan were Alton P. Eames, Newell Winget, Sjostrom, and Chambers of Logan City Corporation; Willis L. Bond of Valley Rendering Corporation; Jay M. Bagley and Vaughn E. Hansen of the Engineering College at USU, and Dr. Hanson. Other Cache Valley residents present were Edwin Gossner, Jr. and Lionel E. Danielson of Cache Valley Dairy Association and Ivan Miller of Tri-Miller Packing Company and E. A. Miller and Sons Packing Company. O. Neil Smith of Hansen and Smith, Associate Engineers in Brigham City represented the firm.

Present also were representatives of the State Departments of Health and Game and Fish, two other Utah engineering firms, and individuals from the Bountiful and Hunter-Granger areas.

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[40]Valley Rendering Company v. State of Utah.

[41]Utah, State Water Pollution Control Board, Transcript of Special Meeting (Salt Lake City, Utah, March 2, 1961), p. 2.

Dr. Sigler proceeded with a description of the operation of lagoons which included an explanation of the causes of objectionable odors sometimes accompanying spring ice break-up. The chairman mentioned several factors which call for attention before a municipality undertakes construction of such a system. Included were the sulphates found in a city's water supply, which, if abundant, could cause odor problems; commercial wastes with chemicals which may cause difficulties; and synthetic detergents which may affect the process of aeration.[42]

Dr. Sigler pointed out that original construction should provide at least one surface acre per 100 people, and that populations from five to 10 thousand seemed to be about the upper limits of lagoon usefulness. He also called attention to the probability that mosquitoes of the Culex species would be found near lagoons, and mentioned the danger of encephalitis from such insects, although noting that certain design and construction features can help minimize mosquito breeding.[43]

Dr. Louis Gebhardt, head of the Bacteriology Department of the University of Utah, provided information on disease organisms which are commonly found in sewage. Dr. Gebhardt thought the important point was the longevity of these micro-organisms in sewage water, and their spread to the populace, possibly through winds carrying them or through children playing where they are present.[44]

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[42] Ibid., pp. 2 and 3.

[43] Ibid., pp. 3 and 4.

[44] Ibid., pp. 5-7.

Construction and operation of lagoons was described by Professor Grant Borg, head of the Department of Civil Engineering at the University of Utah. He quoted the observation made by a public health engineer from Nebraska, who said that his state's lagoon systems would be perfect if it were not for inadequacy of preliminary study, inadequate and improper design, faulty construction, and lack of operation, and that, due to one-sided publicity, engineers and municipal officials are assuming that the lagoon is a panacea for all waste disposal problems. Professor Borg pointed out that other individuals in the sanitation field had seen the urgency for investigations into the production of clear effluents, and for control of disease vectors, and for methods to control pollution of underground waters. He also noted that circulation from winds blowing over ponds was necessary to pond operation but that, as Dr. Gebhardt had pointed out, this could bring aerosols into the air and possibly transmit diseases.[45]

Covering the problems that would have to be faced in lagoon design, Professor Borg discussed areas and loadings, pond sizes, dikes, and multiple unit operation.[46]

Thatcher said he felt that there had been so much discussion of lagooning recently that "a great many people seemed able to speak on it with some familiarity," but he felt that it was apparent that very few people were really well informed on lagoon functioning and sewage treatment. The executive secretary of the WPCB said that sanctioned use of lagoons as treatment systems in various state health

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[45] Ibid., pp. 7 and 8.

[46] Ibid., pp. 7-10.

departments had proved to represent a minority view. He outlined the Utah position on lagoons, and added that the experimental work being done on lagoons was the only new thing about them; that health hazards connected with lagoons had not been evaluated thoroughly; that population growth brings increases in volume of wastes created, plus the consideration that with new subdivisions growing up all over developers might scatter lagoons throughout the area. Thatcher hit hard on the hazardous aspects of lagooning, again comparing their dangers to that of overflowing septic tanks and cesspools. He explained that the coliform count which had been established for Utah streams and for effluents from complete sewage treatment plants where dilution water is not available was 5,000 coliforms per 100 milliliters, and that there was evidence that pond effluents as well as the exposed surface of ponds contained much higher coliform count.[47]

Thatcher stated that it was the belief of the Board that the difference in cost of the two systems could not logically be the deciding factor in a decision as to treatment method. Although lagoons were said to average about half the cost of a plant, it was held likely that actual figures would be higher if a longer detention period of up to six months was necessary, and if land costs were too high. Figures were presented to show a rough $1.00 per month difference in the total cost of construction and operation of the two systems, and Thatcher maintained that the cost of health protection would be well worth the extra dollar.[48]

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[47] Ibid., pp. 10-13.

[48] Ibid., p. 14.

Dr. Hanson expressed his appreciation for the invitation to address the meeting and commended the Board for its efforts to prevent pollution of the rivers and lakes of Utah. He noted that reports of scientific tests on lagoon systems had begun coming out about 1957, four years after the Board adopted its present regulations, and that he was impressed with the excellent end results of oxidation pond treatment made in those reports.[49] He then presented a resume of his findings with reference to the local situation which covered seven single-spaced, typewritten pages of a Transcript of the meeting.

Dr. Hanson's discussion refuted the Board's position on several points. Quoting J. G. Shaeffer, Dr. Hanson called attention to the information that lagoons could be efficient even in the most severe climates (western Canada and northwestern U.S., especially North Dakota); that lagoons had efficiently served populations of 10,000 and 90,000; that the use of this method of treatment was being adopted by significant numbers of communities; that the approach used by persons who act in the interest of public health protection must be related to cost as well as to quality of the end product required; that natural agencies can be utilized to provide suitable conditions.[50]

Schaeffer's report, according to Dr. Hanson, described how an effluent holding basin (depth to be determined by economic or other factors) could be provided so that fewer acres of ground would be needed for the entire site. If a system is designed for no overflow, the site must be much larger and land prices become a serious consideration.

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[49] Ibid., p. 15.

[50] Ibid., pp. 15 and 16.

In 1958 the USPHS had begun tests on lagoons in the Dakotas and elsewhere, and interim reports received by the time of the meeting indicated favorable treatment results. No pronouncement had as yet been made as to BOD loadings, but Schaeffer said Saskatchewan used 50 pounds BOD per acre per day coupled with a liquid loading or a holding period of about 120 days.[51]

Schaeffer noted that tests had shown lagoon effluent to be on a par with third-stage treatment plant effluent during open season operation with BOD reductions in the neighborhood of 98 percent and suspended solids reduction up to 100 percent (with the exception of algae), and bacterial reduction exceeding 99 percent. Efficiency drops during periods of ice-coverage, but approximates that of secondary and tertiary treatment even then. Schaeffer also upheld the contention that the odors occurring during ice break-up, while they range from mild to intense, are usually dispersed in a short distance and are no worse than those coming from conventional treatment plants throughout the year.[52]

Dr. Hanson read from an article by Towne and Davis and quoted Shaeffer on the public health problem involved, pointing out that no epidemics had been traced to stabilization ponds, and that there was no evidence of illness being connected with or related to the operation of a sewage lagoon, either in humans or in wild fowl. The Logan invitee noted that Towne has observed that the mosquito problem in ponds in northern states was related to amounts of aquatic growth

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[51] Ibid., p. 17.

[52] Ibid., pp. 17 and 18.

where insects propagate and that proper control could keep the problem at a minimum. Towne also stated that epidemics and diseases in humans and wild fowl had not been traced to ponds.[53]

During a November meeting in Logan, Peterson had asked the manager of the Brigham City bird refuge if sources of disease in fowl could be directly traced. Specific information was not given at that time as to diseases that were contracted from polluted streams. Dr. Hanson mentioned this incident, and thought it significant that such data had not as yet been disclosed.[54]

Thatcher remarked that the meeting seemed to bring differences into clearer focus and thanked those attending. He hoped that everyone would understand that the Board was not a non-progressive body that would turn its back on new information, and said the Board had certainly been studying the new information on lagooning, but had reached conclusions inapposite to those of proponents of the system.[55]

He said that more recent and intensive PHS studies confirmed contentions that bacterial reductions do not occur as expected and that Schaeffer's studies did not contain actual figures on bacterial reduction which would prove that the quality of the end product was as good as was reputed. Thatcher also did not think that the possibility of higher loadings than those the Board had anticipated were possible for northern areas. He further emphasized the importance of actually

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[53] Ibid., pp. 20 and 21.

[54] Ibid.

[55] Ibid., p. 22.

testing effluent to determine bacterial content, and contrasted this scientific process with any other haphazard method of proving purity. As to the effluent of ponds being low in suspended solids with the exception of algae, Thatcher said this could be true but that the algae problem itself is important because it imposes a BOD on receiving streams. Thatcher did not think that Towne, although recognized as an expert, had answered all questions being asked, especially regarding bacterial count and danger of infection. He read two statements made by Towne at the 1960 "Symposium" to the effect that a prominent researcher in the sanitation field had told Towne he felt more confident of his own understanding of basic factors involved after one or two years of study than he did after several years of working with the problem, which Thatcher believed disclosed some confusion among the experts. Towne had also said that he questioned whether a design would ever be developed that would adequately consider the variability of all factors affecting the functioning of the stabilization pond processes. Towne noted that the potential for propagation of insects and other possible disease vectors was no doubt greater in ponds than at conventional treatment works and requires consideration by the designer. Thatcher referred to other reports that had shown the danger potential of ponds with respect to producing mosquitoes, and told of a PHS survey in Davis County, Utah, which resulted in condemnation of certain ponds which produced such a large population of the encephalitis type mosquito.[56]

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[56] Ibid., pp. 22-24.

Professional engineers and state regulation

Keith A. Hansen, a professional engineer who heads his own consultant firm in Brigham City (formerly Hansen and Smith Associates), became involved in the attempt to alter rigidity of WPCB standards when he was retained by the city of Corinne to do a sewer system study in 1961.

He criticized the March special meeting as an attempt to "damn" the lagoon system instead of an attempt to assess factual, available data.

In his analysis of the meeting, Hansen summarized current opinions of most experts in the field:

1. Properly designed and operated stabilization ponds provide a degree of purification comparable to that obtained by conventional treatment plants.

2. Lagoons are not the panacea to all sewage treatment needs, but have their advantages and disadvantages like other treatment processes, and they should be considered in the economic and engineering evaluation.

3. No cases of infection or epidemilogical evidence is available as a result of sewage lagoons, even though water fowl hunters have used the lagoons as hunting grounds.

4. The mosquito problem can be satisfactorily controlled by proper operation and maintenance.

5. Potential health hazards exist in all methods of sewage treatment.[57]

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[57]Keith A. Hansen, "Analysis and Commentary of the Published Position of the Utah Water Pollution Control Board on Oxidation Ponds" (unpublished report, Brigham City, Utah, January, 1963), n.p.

The engineering study of Corinne's sewage problem indicated that a lagoon system was feasible for the town (population about 500), and that it could be constructed for almost half the cost of a mechanical plant. In an effort to gain WPCB and Board of Health approval, Hansen incorporated in the Corinne report a study on the acceptability and feasibility of sewage lagoons. He submitted requests, accompanied by supportive data on the efficacy of lagoons to the state boards, and gained tentative approval for such a system in Corinne from the WPCB in December, 1963.[58]

Such approval was the result of studies carried out by special committees of the two state regulatory agencies involved. Lagoon design was hammered out under guidance of committees of the Utah Society of Professional Engineers (USPE) and of the Utah Chapter of American Society of Professional Engineers (ASCE). Hansen was a member of the Ethics and Practices Committee of USPE. His aim was to promote the significant involvement of professional personnel in the formulation of state policies which affected them, and to encourage engineers to take full advantage of current technical knowledge.[59]

Municipal Election, 1961

A platform stressing mosquito abatement and adequate sewage and landfill facilities for Logan helped Bishop defeat incumbent Mayor Hunsaker in the 1961 municipal elections.

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[58]Lynn M. Thatcher, letter to Keith A. Hansen, December 20, 1963.

[59]Keith A. Hansen, personal interview in Brigham City, Utah, July, 1968.

During one pre-election educative meeting, candidates answered questions on local issues. The open meeting was sponsored by the Women's State Legislative Council of Cache Valley. Dr. Alison (Mrs. Wynne) Thorne, Health and Safety Chairman, introduced Hunsaker, Bishop, Covington, and Dr. Sigler, Dr. Hanson, and Dr. Roberts, acting as resources assistants.

Bishop questioned the use of lagoons, and remarked that federal funds would not be forthcoming if the city chose to install this system since it had not been approved by the WPCB. Hunsaker was undecided on a method of treatment, but said that bonding was the best way to finance either project. Dr. Hanson presented arguments for lagoons, and Dr. Sigler reminded the 105 persons present that the state Board had not endorsed lagooning.[60]

The Women's Legislative Council worked for the election of Bishop, whom they thought to be responsible and progressive. Of concern to the group were potential health dangers under existing sanitation conditions in the community.[61]

In order to improve city services, the Bishop administration increased taxes, raised water rates and levied a charge for garbage disposal. By the fall of 1962, widespread criticism of increased government expenditures was apparent, and to some it seemed unlikely that a bond issue election would be successful.[62]

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[60] Herald Journal, November 3, 1961, p. 1.

[61] Mrs. George Judah, telephone interview in Logan, Utah, September, 1968.

[62] Mayor Richard A. Chambers, personal interview in Logan, Utah, October, 1968.

Commissioner Chambers, who was defeated in the City Commission race in 1963 and subsequently elected Mayor of Logan in 1965, felt that an unsuccessful bond proposal would cause the WPCB to take more decisive action against the city, which would eventually force action.[63]

Chambers had discussed sewage treatment methods with Professor Stock and Dr. Bishop following defeat of the first bond issue election, and favored consultation with Stock at this time. Professor Stock was affiliated with Templeton and Linke.[64]

Several local persons were probing the lagoon idea prior to 1960, but realized that promotion of this system depended upon a change in state regulations. Chambers was a board member of the Utah Municipal League at the time.[65]

Bond Issue Election, 1962

The usual procedure in retaining engineering consultants is to first contact a competent firm to do a preliminary study which will define the problem and recommend solutions and alternatives. Cost for this brief report is fixed. The preliminary study is then submitted to the client, who considers financial arrangements. At this point, if the client is a city, interests of citizens must be considered by officials. Finally, the client returns to the firm who did the preliminary report to get a full study. Cost of the completed study is based on a percentage of total cost, and the percentage depends

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[63] Ibid.

[64] Ibid.

[65] Ibid.

upon the nature and size of the job.[66]

On January 3, 1962, Templeton and Linke were retained by Logan City to complete an engineering study of the city's sewage problem. An October, 1961, preliminary report by Win Templeton to City Commissioners had recommended a mechanical plant for the city. Cost was set at $1,600,000. Templeton outlined construction changes, operation and maintenance, and explained that a two-stage high rate plant could be constructed at a lower initial cost than could a lagoon system. That is, a mechanical plant would cost the city less during the years the bonds would be retired. The mechanical system, approved by state regulations, would be designed so that effluent would not violate class "C" water classification.[67]

Later, during a public meeting when officials discussed their views on the 1962 bond issue election, Templeton said that the lagoon system estimate was high in the firm's study because it would be necessary to keep all weed growth down on dikes to prevent mosquito breeding, and the flow from lagoon to lagoon must be regulated to keep proper flow moving through.[68] The Templeton and Linke study of lagoons called for 810 acres of land containing 24 separate lagoons and over 15 miles of levies and dikes.

D. F. Peterson, Jr., Dean of the College of Engineering at USU, explained at the same meeting that the problem of excessive infiltration in Logan caused the price of a mechanical plant to be higher

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[66] Norman Jones, interview.

[67] Herald Journal, October 18, 1961, p. 1.

[68] Ibid., December 6, 1962, p. 1.

than would otherwise be expected.[69]

A special meeting of city commissioners was called to confer with Templeton and with Ralph W. Burroughs of Burton and Company, financial advisors from Salt Lake, on financing and sale of bonds for the project. Burroughs recommended issuing $600,000 in general obligation bonds to be supported by a 1½ mill levy on property, and $1,000,000 in revenue bonds to be supported by a monthly service fee of $2.00 per residence connection with higher fees for schools and commercial users.[70]

An ordinance provided for the December 11th bond issue election in which qualified voters would be presented with the above financial proposal for a new plant. Qualified voters were those who paid local property taxes in the preceding year. The bonds were to be retired in no more than 30 years, and were to bear interest not exceeding five percent per annum.[71]

Campaign controversy

Dr. Thorne conducted a panel discussion December 6th, co-sponsored by the Cache Chamber of Commerce and the Women's Legislative Council, when officials and others presented views on the impending special election. Mayor Bishop declared that he had no argument with this type of system, but that action must be taken immediately on the city's waste problem. He said that the average cost per family per year of installing the proposed mechanical plant would be about $27.00.

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[69] Ibid.

[70] City of Logan, meeting of October 24, 1962.

[71] Ibid., meeting of November 6, 1962.

The Mayor also reminded citizens that officials must answer for the city's action in district court in just five days.[72]

Dean Peterson explained plant costs and endorsed the proposed facilities. Templeton also explained costs of the plant. Dr. Reed Broadbent, the city physician, urged action in the interests of public health. Thatcher explained that the usual practice in cases where cities refuse to comply with Board rulings was to levy increasingly heavy daily fines. (City engineer Hugie said during an interview that he understood city officials would bear the brunt of such a fine.) Dr. Alvin Bishop urged support for city officials.[73]

In answer to a question about the new sewer hookup in the Island area, Thatcher commented that the Board had granted such authority on the assumption that city officials would move ahead with treatment facilities.[74]

A letter to the editor in the same issue of The Herald Journal defined pollution and urged action to prevent the dire consequences of its spread throughout a community. Dr. Hanson's letter added to information on lagoons and urged their consideration.[75]

Groups who announced support as sponsors of the bond issue included the Legislative Council, the Cache Chamber of Commerce, AC Women's Club, the American Association of University Women, and the Business and Professional Women's group.

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[72] Herald Journal, December 6, 1962, p. 1.

[73] Ibid.

[74] Ibid.

[75] Ibid., pp. 6 and 7.

The Herald Journal printed articles and letters from individuals who offered information relevant to the issue. One letter blamed the "scientific people at the University," for forcing a big bond issue on the people of Logan, and asked if these University scientists could not give some advice other than methods of taxation.[76]

Editor Ray Nelson noted that statistics from HEW on ponds indicated that lagooning was an exciting innovation, but that installation was then experimental.[77]

Some individuals and groups bought quarter-, half-, or full-page ads a few days before the election. USU biologists endorsed the proposal for a mechanical system in a one-half page ad which was also signed by A. Alvin Bishop and some 128 other individuals, most (perhaps all) of whom were USU engineering personnel.[78]

On December 9th a front-page story told of the court hearing to be held the same day as the bond election when city attorney Thomas and others were to report on anti-pollution efforts.[79]

Several local dentists and physicians and the Logan Jaycees submitted letters and ads supporting the election issue. Dr. Hanson included a note to the people of Logan on the use of enzymes in ponds. He believed they would be useful in aiding the biological process, and said that action against the lagoon system would preclude use of

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[76] Ibid., December 4, 1962, p. 5.

[77] Ibid., p. 2.

[78] Ibid., December 9, 1962, p. 8.

[79] Ibid., p. 1.

these agents.[80] (Enzymes have been considered for this use, but civil engineers who deal with sanitary facilities consider them highly unpredictable.)[81]

A news story explained that the bond election was to determine if city officials would be empowered to borrow money to clean up sewage, and was not to be an election to choose one or the other method of treatment.[82]

Attorney George Preston warned in a letter to the editor that proponents of the lagoon system were actually trying to defeat the bond issue election in a "cunning move." He said the city would be in contempt of court if they did not accept this proposal. Another letter came from an A. Duck on the west side duck pond, who pleaded for clean ponds. The Citizens for Better Government Committee ran a one-half page ad asking citizens to vote "no." A letter from Montrose on election day asked that the "crash and scare" program of mechanical plant proponents be repudiated.[83]

At the December 11th hearing, Judge Jones set an April 1st trial date for some firms involved in the pollution case, but excluded Logan and Wellsville since they had submitted plans for improvements.[84] On the same day the bond issue proposal was defeated by 122 votes with 1530 for, and 1634 opposed. Voting districts in the west and south sections of town voted heavily against the issue.[85]

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[80] Ibid., p. 9.

[81] Norman B. Jones, interview.

[82] Herald Journal, December 4, 1962, p. 1.

[83] Ibid., pp. 5, 10, 11, and 18.

[84] Ibid., December 11, 1962, p. 1.

[85] Ibid., December 12, 1962, p. 1.

In his column, "Thoughts and Things," the day following the election, Nelson mentioned some things that would be sorely missed

> . . . impassioned pleas dealing with hepatitis and encephalitis . . . and comments like "let's change the name of our village to Lagoon" . . . and reading things like "use of enzymes in our way of life is equal in importance to the nuclear fission program."[86]

"What to do next?" asked the author.[87]

Special bond election expenses in the amount of $306 were presented during a December 18th Commission meeting.[88]

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[86] Ibid., p. 2.

[87] Ibid.

[88] City of Logan, meeting of December 18, 1962.

REVISION OF STANDARDS

Review of Regulations

In 1963 the State Board of Health and the WPCB began a comprehensive review of existing regulations governing the design, construction, and operation of waste treatment works in Utah. Committees and staff members prepared drafts of proposed regulations to be considered at public hearings before final action was taken.

A July 26th meeting was called to discuss sewage lagoons and related matters. Attending were the committeemen and chiefs of state agencies involved, three USPHS representatives, an official from North Dakota's Department of Health, and Dallin W. Jenson of the Utah Attorney General's office.

Prompting the meeting was the 1963 attempt to pass legislation (SB 198) which would eliminate authority of the WPCB in certain areas. Also influencing the decision to probe the problem in this manner was the opposition of some cities and districts to chlorination of sewage treatment plant effluent, and the offer of technical consultation on the problem of raw sewage from USPHS.[1]

Thatcher summarized the background leading to present circumstances. He began by noting that:

> When the Water Pollution Control Board first faced the task of developing quality standards for streams, it had to recognize

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[1]Utah State Department of Health, Summary of Meeting (Salt Lake City, Utah: July 26, 1963), n.p.

> the concept of re-use of sewage effluents because many stream channels in Utah contain no dilution water, so stream standards in many cases would be the equivalent of effluent standards.[2]

The difficulty of suggesting a limit for bacterial content of water used for different purposes was pointed up. There were few precedents at the time, and only limited epidemiological information was available to support such limits. However desirable it would be to eliminate harmful bacteria from the environment, such a goal would be beyond practical attainment. Final limits adopted were included in "The Standards of Quality and the Regulations for Water Classification," and in a proposed publication, "Utilization of Sewage Treatment Plant Effluent and Sludge."[3]

Thatcher asserted that a comparison of these standards with others then proposed or in use throughout the United States indicated that they were about average for the country, except that some states had more stringent requirements.[4]

Classification had been applied formally to the Weber River and the Bear River, and in the latter case, a challenge to the Board's action was still in court, notwithstanding USPHS acceptance of the Board's action under authority of the Federal Water Pollution Control Act.[5]

Thatcher also noted that adoption of the "Standards for Sewage Works," covering design criteria, included the stipulation that raw

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[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] Ibid.

sewage lagoons were not permitted, and that distribution of meeting Transcripts after 1961 had apparently failed to accomplish any real gains toward a public understanding of the Board's position.[6]

According to Thatcher, since the WPCB had lost any authority it had to eliminate the danger of exposed raw sewage in the environment as a result of the Attorney General's opinion concerning lagoons which have no overflow, it would be possible for anyone to build such a lagoon without sanction of the Board. In such cases, whatever hazards came with such exposure would have to be viewed as acceptable under Utah law.[7]

The Board would accept as necessary such hazards if they were to be generally acceptable in other states.[8]

Purpose of the present meeting was to point the way to design criteria which would fit Utah's needs and would also provide some guidance on other related matters of concern.[9]

The North Dakota visitor said lagoons were completely acceptable sewage treatment devices in his state, designed on the basis of BOD loading with about 100-120 days detention of flow because of difficulties imposed by winter season. Two-cell installations were preferred because they produce better effluent. Coliform removals by lagoons had been good percentage-wise, but final effluents generally had a count substantially above Utah's requirements for stream flow.[10]

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[6] Ibid.

[7] Ibid.

[8] Ibid.

[9] Ibid.

[10] Ibid.

A USPHS representative reported that, on the basis of studies in Lebanon, Ohio, his opinion was that a reasonably clear lagoon effluent could be chlorinated with good results.[11]

It was pointed out that raw sewage lagoons in the environment do not constitute an unacceptable health hazard, if properly sealed, fenced and isolated. The opinion was expressed that wind-blown contamination was more of a hazard from trickling filters and activated sludge plants than from raw sewage lagoons, and that the waterfowl hazard was unimportant, notwithstanding the fact that waterfowl can be excluded from mechanical treatment plants but not from lagoons.[12]

Utah's standards were said not to be unreasonable if applied with reason. Chlorination of plant or lagoon effluents may be necessary when they are used recreationally, for irrigation, or where substantial dilution is lacking or when it is necessary to meet an accepted standard.[13]

Further discussion dealt with specifications for soil tests; depths of lagoons; lagoon odors; series operation of lagoon cells; storage during winter; amounts of chlorine for both types of treatment facility (may be about the same due to reduced volume of lagoon effluent); isolation of lagoons; and dike tops and area for future expansion.[14]

Also mentioned during the meeting was the Michigan practice of accepting a new process of sewage treatment based on satisfactory demonstration of the process in the state.[15]

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[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] Ibid.

[15] Ibid.

Citizens Advisory Committee

A Citizens Advisory Committee to the Logan City Commission was appointed in 1963. The committee was to be neutral, objective, and representative of community interests in seeking an acceptable alternative which would answer the community's needs.

USU engineering faculty on the committee who worked with city engineer Hugie in providing technical advice were Professor Norman B. Jones, chairman, and Dean Peterson. Other members were Joseph C. Jacobsen, John W. Carlisle, M.D., Dean Rogers, Dean Baugh, Henry R. Cooper, and Presbyterian minister, Reverend Miner Bruner.

In one or two cases, appointment to the committee was made in the hope that association with the group, plus the prestige which attaches to serving in an advisory capacity would sway the thinking of influential individuals who continued to oppose the idea of lagoons.[16]

This tactic apparently achieved cooperation in committee activities; however, several persons interviewed during this study were aware that some individuals who professed commitment to promotion of one or the other bond issue proposals, were known to be "working for the other side" at the same time, by contributing to advertising campaigns, or by contacting others who might exert substantial influence.

The work of this core group was primarily technical. Several consulting engineering firms from Utah, Idaho, and Oregon in the field of water pollution control were interviewed to assure that Logan City

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[16] Ray Hugie, personal interview in Logan, Utah, June, 1968.

would be represented by a competent firm with experience in design of both plant and lagoon systems.

Utah firms were, in some cases, at a disadvantage, since the inflexibility of state standards limited their chances of dealing with alternatives to mechanical plants.

Although it seemed that Utah's design "Standards" were so strict in outlining what could be done that they caused neglect of current methods and new knowledge, executives of state regulatory agencies explained that they did not have the staff and funds necessary to undertake an extensive study which would point up desirable changes.[17]

In December, following six months of interviews with principals of engineering firms, chairman Jones presented the recommendation of the committee that the city negotiate a contract with a Boise, Idaho firm, Cornell, Howland, Hayes, and Merryfield, to prepare a study and report on the most feasible and economic method of providing the city with adequate sewage facilities.[18]

As part of this study, which began in March, 1964, representation for Logan City at the anticipated public hearing concerning waste disposal regulations was to be provided. The technical information and research summarized in the preliminary study was prepared for possible use in meetings or during public hearings.[19]

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[17]Norman B. Jones, interview.

[18]Ibid.

[19]Cornell, Howland, Hayes, and Merryfield, "Literature Research and Proposed Waste Stabilization Pond Design Criteria" (unpublished preliminary report, Boise, Idaho, 1964), p. 1.

The Sewage Issue in the 1963 Municipal Elections

Spending by local government became a major issue in the 1963 municipal election for commissioner and city auditor when Nephi J. Bott, retired businessman, challenged Chambers for his post. Related to the spending issue was the 1962 sewer bond election.

Bott campaigned to offset what he described as "an epidemic of spenditis" which had struck city officials. He claimed that the symptoms were a steady increase in taxes, no desire to check reckless spending, inefficiency, permitting city officials to raise their own salaries, and the making of new policies over the protests of influential citizens.[20]

Bott favored letting churches and other public institutions use city water free of charge, not raising the expenses of persons on low, fixed incomes, nor raising expenses of local businesses so much that they had to move out of town. He proposed a balanced budget for the individual, the city, and the nation in harmony with the ability of all the people to pay, and a suitable sewage system.[21]

Among measures which Bott opposed were such "ill-considered action" as holding a bond election without adequate investigation of the problem involved, then setting up a citizen's committee to investigate after the issue had failed and the city had spent about $1,100 for election expenses. He also pointed out that the city had paid $3,800 for a preliminary engineering study prior to the bond election.[22]

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[20] Herald Journal, October 31, 1963, p. 9.

[21] Ibid., November 3, 1963, p. 8; November 4, 1963, pp. 2 and 3.

[22] Ibid., November 4, 1963.

Chambers had explained in an earlier newspaper ad that the Citizens Advisory Committee would provide a study which would be a basis for determining the type of system to be used at Logan.[23]

The Commission was also criticized for consulting with an engineering firm favoring mechanical plants for the second time, thereby ignoring the possibility of constructing a less expensive system. Bott questioned the pay raise of $20,000 which the Bishop Commission afforded themselves, saying that his opponent knew how much pay he would receive when he sought the office.[24]

Chambers responded to such criticism with a comparatively low-key campaign. He felt that the sewage issue contributed to his defeat but that an all-out campaign effort may have altered results.[25]

A day before the November 5th election a statement by Mayor Bishop in The Herald Journal explained the policies and actions of his administration. He pointed out that progress had been made with a sanitary landfill garbage disposal, mosquito abatement, street improvements, expanded off-street parking, and adoption of a master plan for the city. He explained the rise in service rates by noting that water and electrical utilities had received much-needed attention. Mayor Bishop did not elaborate on the sewage bond issue, except to say that citizen advisory groups were used to good advantage in other areas and could provide useful functions in Logan.[26]

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[23] Ibid., October 29, 1963; Chambers, interview.

[24] Herald Journal, November 4, 1963.

[25] Chambers, interview.

[26] Herald Journal, November 4, 1963, p. 7.

Only 56 percent of registered voters cast ballots in the election. Bott defeated Chambers by a 190-vote margin. Fifteen more votes were cast in the city auditor race than were cast in the commission race. Darrell Daines was elected auditor.[27]

Proposals by Engineers

The Joint Society Committee on Ethics and Practices of ASCE and USPE were involved, by 1964, in formulating policy which would lead to better communication between practicing engineers and the Pollution Control Board. Questions had been raised by members concerning details of the new standards for sewage lagoons being considered by the Board. Harold A. Linke, Jr. of Templeton and Linke, chaired the committee.[28]

Committee members reviewed the proposed "Waste Disposal Regulations" and submitted recommendations to Thatcher and his staff. Keith Hansen's comments included criticism of a ruling which would cause all plant effluents to be chlorinated, since it seemed unnecessary to classify receiving waters if all effluents were to receive the same treatment. Hansen also noted that design criteria called for pond sizes in excess of those in areas with established, working lagoons.[29]

He had questioned a statement in the proposed standards to the effect that Chapter 90, dealing with lagoons, was a copy of the "Ten-State Standards," except that revisions had been made to provide greater detail found necessary to meet conditions in Utah, and was told that the

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[27] Ibid., November 6, 1963, p. 1.

[28] Warren D. Curtis, letter to Keith A. Hansen and others, February 19, 1964.

[29] Keith A. Hansen, letter to Harold A. Linke, April 22, 1964.

intent was to protect the receiving streams since Utah streams do not provide the dilution available in states currently using lagoons. Hansen felt that streams were already protected by stream classification, and that engineers should be allowed to provide the most practical and economic facility which would meet requirements. He also encouraged engineers to oppose a closed door policy on new processes.[30]

Hansen carried on a vigorous campaign through correspondence, study, and contacts with state officials, national representatives, and others who were interested in the attempt to revise existing regulations.

Hansen contacted Municipal League attorney Ferro regarding an editorial in The Salt Lake Tribune, praising the WPCB for their efforts in the last decade in bringing community and industrial waste disposal up to health standards.[31]

Sparking the editorial comment was a resolution adopted by the Utah Municipal League in September, 1964, to negate the authority of the Board over sanitary sewage disposal in the state. The Tribune viewed such a move as inconsistent with the League's past record in matters of public interest, because such a move would strip the Board of its authority in pollution control and "permit certification merely by 'competent engineers.'" The State Board of Health had taken formal action opposing the League resolution.[32]

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[30] Ibid.

[31] Salt Lake Tribune, (Salt Lake City, Utah), December 28, 1964, p. 16.

[32] Ibid.

Referring to SB 198 which would have denied the Board authority to pass on design and construction of sewage treatment plants for cities, The Tribune commented that lagoon type sewage disposal was a controversial issue at that time. The article also explained that although complete sewage treatment systems do pose financial problems for towns, alternatives are increasingly dangerous, and no community is isolated so far as disease germs are concerned. Infectious hepatitis, the writer noted, respects no boundaries.[33]

During the summer, representatives of the engineering committees met with WPCB officials to iron out differences over Chapter 90. The Board had requested suggestions for the modification of standards from other firms and individuals. Among respondents were Dr. Hanson and engineers from the consultant firm retained to do the Logan City study.

Dr. Hanson listed several items on lagoons which he felt should be changed. He was advised of five changes in the 1964 draft which agreed with his recommendations: (1) area and loadings liberalized; (2) recognition (in pre-treatment) of partial treatment; (3) removal of limit on storage depth; (4) changes in wording dealing with riprap; (5) changed fencing and depth requirements.[34]

By mid-December a draft of "Waste Disposal Regulations, 1964," had been prepared for adoption by the WPCB and State Board of Health.

A special meeting of the Logan City Commission had been called the day before Christmas to discuss the recently completed engineering

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[33] Ibid.

[34] G. D. Carlyle Thompson, M.D., letter to Dr. Hanson, December 23, 1964.

study. Members of the Advisory Committee attended, and Dean Peterson moved that the report recommending a lagoon-type system for Logan be accepted.[35]

Mayor Bishop instructed city attorney Thomas to be prepared to initiate legal action of standards of the WPCB would not permit the construction of the lagoon as designed, and to continue preparation of the necessary legislative measures to ensure the city's right to construct these facilities.[36]

Public Hearing on Proposed Changes

Thatcher was named hearing officer of the January 4, 1965, hearing in Salt Lake City on adoption of the "Waste Disposal Regulations." He explained that the proposed draft regulations had been made up after changes were made in a previous draft (February 17, 1964), and that the proposals under consideration were essentially to update and to continue existing controls.[37]

The state boards had recognized the responsibility and authority conferred on local levels of government by providing that certain waste disposal activities be placed under local jurisdiction within the framework of statewide requirements. Areas of technical consideration were defined in the five parts of the proposed regulations. Part III, "Sewers and Wastewater Treatment Works," covered design requirements and was an updating of the "Standards for Sewage Works."

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[35]City of Logan, meeting of December 24, 1964.

[36]Ibid.

[37]Utah, State Department of Health, Transcript of Public Hearing in the Matter of Adoption of Waste Disposal Regulations (Salt Lake City, Utah, January 5, 1965), p. 2.

The significant change allowed lagoons as treatment for raw domestic wastewater. Most sewer system design standards were made recommendations rather than requirements.[38]

Changes in the 1965 draft relating to lagoons were to make lagoon fencing requirements less specific with respect to type of fence, to double allowable loading on primary lagoons (with reservations), to increase lagoon depth, to make dike requirements less restrictive, to eliminate maximum depth limit for secondary lagoons, and to require emergency spillways on non-overflow lagoons.[39]

The first recommendation from the floor was contained in a "Statement" by the Utah Municipal League:

> That portion of the regulations which relates to specifications of construction and details of operation should be treated by the Board as recommendations offered to the political subdivisions for their guidance and the guidance of their engineers, leaving to the political subdivisions the ultimate discretion as to the final specifications followed. The Utah State Board of Health and the Utah Water Pollution Control Board have vested in them only the authority to prevent discharge of pollutants into waters of the State.[40]

Leaving specific questions to the city's consultant engineers, Logan Mayor Bishop described the local situation and assured the WPCB that the city had no quarrel with the classification placed on the Bear River.

Earl C. Reynolds, Jr., a partner in the firm of Cornell, Howland, Hayes, and Merryfield, thought there might be four major points on which there could be room for discussion of the present standards covering

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[38] Ibid., pp. 2 and 3.

[39] Ibid., pp. 4 and 5.

[40] Ibid., p. 7.

ponds, and introduced Gene Suhr of the firm's Corvallis, Oregon, main office, who was the engineer assigned to the specific project of developing the investigation of proper facilities for the city of Logan. He undertook a review of literature in order to submit comments for recommended revisions to the standards which were proposed by the firm.

Suhr cited research data which upheld his contentions that: (1) a 120-day storage requirement was not necessary; (2) purely structural matters (such as slope of dike) should be left to the discretion of the engineer instead of being a requirement; (3) it should not be necessary to demand that pond bottom be as level as possible at all points and finished elevation need not be set; and (4) it is not necessarily good practice to operate primary cells at a constant level. Suhr submitted a summary of research documents to the Boards.[41]

Thatcher questioned Suhr about the effectiveness of coliform removal, via lagoon treatment, in meeting stream classifications, and was told that research (especially in South Africa) had shown that if tertiary cells were added, a highly desirable effluent could be obtained. Suhr also asserted that coliform die-out was not particularly temperature dependent, as shown by Public Health and other research.[42]

The consultants were asked for further research on some points which could be presented to the state boards to more adequately answer some questions.

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[41] Ibid., pp. 9 and 10.

[42] Ibid., pp. 13 and 14.

Others with questions and recommendations included Keith Hansen (who repeated his stand on design being the province of the engineer), ASCE Committee chairman Linke, attorneys, representatives, and officials from municipalities and sanitation and improvement districts in Utah. The Utah League of Women Voters thought a deadline should be set whereby pollution of state waters must cease.[43]

A discussion on the preventive philosophy, in connection with state regulations of design brought out differences in views between two representatives of Utah consultant firms. Standards which call for adequate design would not be restrictive as such, but they would be restrictive if they allowed no deviation from a given set of design standards, thus discouraging experimentation. Standards should be used as a guide for regulatory agencies in reviewing proposed designs. Agencies should advise, but the political entity involved should consult with their engineer and have final determination on adequacy of proposal.[44]

However, a question arises with respect to allowing laymen to pass on adequacy of engineering design. This much freedom from regulation could result in poor engineering practice, because it would be possible to construct anything within legal limits. Permits issued by a regulatory agency prevent such conditions.[45]

Mayor Bishop asked for a meeting between Thatcher, the Logan City Commission, and their engineers so that the WPCB could go over proposals for the city's facilities.

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[43] Ibid., pp. 15-30.

[44] Ibid., pp. 30 and 31.

[45] Ibid., pp. 32 and 33.

The WPCB extended the hearing to February while additional comments were received, including changes accepted by the Board Committees after the first hearing. Engineering and Board Committees also attended another hearing before the Political Subdivisions Committee of the Utah Senate on January 22nd to resolve differences on the subject of SB 17, through which it appeared the Utah Municipal League again sought to reduce powers of the Board with respect to treatment plant construction.[46]

This Anti-Pollution Treatment Works Bill, introduced to the Senate in 1965, said that the Board would not have power to control, direct or determine the type, manner, or theory of construction of work for political subdivisions of the state. The Board's power would relate to prevention of pollution of waters of the state, and that body would be required to grant approval for loans, etc., if the discharge of effluent into waters of the state was certified by competent engineers to meet standards promulgated by the Board. The bill was dropped after a second reading.[47]

Senate Bill 17 was also discussed during a January 30th meeting between representatives of engineering groups, and Ferro and Bennie Schmeitt of the Municipal League. It was agreed that backing for the bill be withdrawn and that a vote requesting the proposed changes in WPCB standards be entered.[48]

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[46] Ibid., pp. 36 and 37.

[47] Utah, Senate, SB 17, 36th sess., Utah Legislature, Senate Journal, numerical index, 1965, p. 891.

[48] Harold A. Linke, letter to Utah Water Pollution Control Board, February 1, 1965.

Areas of possible conflict between the proposed Logan City lagoon system and WPCB standards were outlined during a special meeting in Logan. Those discussing were Jones, Dean Peterson, Thatcher, two other members of the Board committees, and Reynolds. An exchange between Reynolds and Thatcher, described as an "informal discussion" produced an understanding on areas of conflict.[49]

The city proceeded with financial and engineering plans for the new sewage facility, and set an August 31st bond issue election date.

Revised code adopted

The State Department of Health and the WPCB adopted a revised Code of Waste Disposal Regulations in May, 1965. In the interest of protection of health and welfare, the two agencies assumed primary responsibilities and authority to take all necessary measures to prevent wastes from becoming hazards to health or a detriment in any way to surface or ground quality.[50]

The Code was designed to establish requirements for producers of waste, including individuals, political subdivisions, and industries in meeting the present and projected obligations which would assure protection of public health and of waters in the state. The need for flexibility of regulations due to the appearance of new and unique waste products was recognized. Owners and operators of waste disposal systems must be aware that any facility constructed to treat wastes

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[49]City of Logan, meeting of January 18, 1965.

[50]Utah, State Department of Health, Code of Waste Disposal Regulations, foreword to May 18, 1965, revision.

must actually produce an effluent meeting quality requirements specified in the publication.[51]

Waste producers are to obtain the professional services of registered engineers who should be specialists in the field of sanitary engineering and are qualified to design and construct adequate facilities.[52]

Waste stabilization ponds could be used for treatment of either raw wastewater or effluent from other treatment processes. Ponds treating domestic wastewater were generally expected to produce the equivalent of secondary treatment as described in other sections, when proper attention is given to all design details. However, since pond operation would be influenced by somewhat uncontrollable and relatively unpredictable natural phenomena such as temperature, cloud cover, precipitation, soil permeability, etc., adequate factors of safety should be provided in the design. One problem deserving of special attention was the prolific algae production which is necessary in early phases of pond treatment but which may interfere with final effluent quality, especially when chlorination is employed. The uncertainties involved in prediction of effluent quality could result in a need for construction of additional ponds or other modifications of design after facilities are placed in operation.[53]

Specific requirements included placing the ponds in an isolated spot not less than 1,000 feet from human habitation (or where building

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[51] Ibid.

[52] Ibid.

[53] Ibid., Part III, sec. 83, p. 37.

may occur within a reasonable period); placing the ponds downwind of inhabited areas and away from water supplies and other facilities subject to contamination; enclosing them within a fence with access gates which are provided with locks; and placing appropriate warning signs along fences. The number and size of ponds, their embankments and dikes, pond bottoms, inlet and outlet structures, and flow measurement, and non-overflow types of ponds are also specified.[54]

An Educative Campaign

An information sheet, "Questions and Answers Concerning Logan City's Bond Election," was prepared by the Advisory Committee to be disseminated throughout the community by an expanded citizens' committee. The sheet contained inclusive information on construction of the proposed sewage system, financial arrangements, necessity of installing the facility, comparative cost of the 1962 proposal, future service, service charges, acceptability of lagoons by the WPCB, health and insect problems, and the assurance that a competent engineering firm would represent the city's interests.

The citizens' committee also showed colored slides of other lagoon systems installed by the engineering firm in neighboring states. They contacted service clubs, professional people, and city employees' groups. Arrangements were made to have the information presented to neighborhood groups in Mormon homes during evening gatherings when LDS "home visitors" gave church talks.[55]

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[54] Ibid., secs. 84-91, pp. 37-41.

[55] Norman Jones, interview.

Radio spots and newspaper coverage added to the educative efforts of the committee. USU personnel providing technical information included Dr. Pete Randall and Dr. John Neuhold of the Wildlife Resources Department. Professor Jones gave talks before civic groups and during visits to home groups.[56]

Total capital cost of construction was estimated to be $2,524,000, less a federal grant of about $524,000. The $2,000,000 in municipal bonds would be tax-exempt and bonds were expected to sell for between three and three and one-half percent interest. The engineer's estimate covered cost of land acquisition (about 600 acres, of which some 450 acres would be total water surface pond area), plus other contingent costs. If costs were less than the estimate, only enough bonds were to be sold to finance the project.[57]

The 1965 bond authorization topped the 1962 proposal by $400,000. It was explained that there was essentially no difference in cost of treatment facilities, since the estimate for pond construction was about $1.43 million, and cost of the trickling filter sewage plant in the previous election was about $1.5 million. The current bond issue was higher due to increased construction costs (about 10 percent in the intervening years), and inclusion in the current program of a larger capacity system which would provide service to a larger area. If the 1962 proposed system had provided the same services, it would have cost an estimated $2,112,000. The 1965 plan included handling several hundred thousand dollars worth of groundwater problems in the

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[56] Ibid.

[57] Citizens Advisory Committee, "Questions and Answers Concerning Logan City's Bond Election," Logan, Utah, 1965. (Typewritten.)

Island area.[58]

Total annual cost of operation, maintenance and financing of the lagoon system was estimated to be almost $50,000 per year less than comparable costs of utilizing the trickling filter facility. To meet costs of operation and maintenance and to pay for bond retirement and interest, revenues were to be derived from monthly service charges, plus a 1.5 mill property tax levy. Service charges to commercial, industrial and school establishments would be proportionately larger than the $2.00 single residence fee. The facilities were designed for adequate treatment through the year 1990 with a projected population growth of about two percent per year, and permitted expansion in case of growth exceeding current estimates.[59]

Bond Issuance Approved

An August 31st special election submitted to voters the question of approving issuance of $1,400,000 in general obligation bonds and $600,000 in revenue bonds. The issue was approved by a 956-vote margin, with 1585 for and 629 against.

Bids for the purchase of $1,000,000 in general obligation sewer bonds were received by the Commission in October, 1966. This was the first block of the authorized $1,400,000 in bonds. The bonds were to mature serially in numerical order on October 1st of each year from 1967 through 1986.[60]

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[58] Ibid.; Hugie, interview.

[59] Ibid.

[60] Burrows, Smith and Co., "Logan City, Official Statement and Notice of Sale of General Obligation Bonds, Series October 1, 1966," Salt Lake City, Utah, p. 2.

City auditor Daines did not anticipate that it would be necessary to sell any of the revenue bonds, due to changes in plans and income from sewer service charges in effect by January, 1966. Approximately $200,000 in general obligation bonds were expected to be sold in 1967.[61]

Part of the saving resulted from relocation of the pond site some 4,000 feet nearer the city, thereby eliminating about $120,000 in cost of outfall line. The city was also able to negotiate with the WPCB a reduction in the number of acres of land, and to reduce the size of the ponds. Reduction in over-all project cost made it possible for the city to anticipate amortization of the project from monthly service charge proceeds, so that it would not be necessary to levy any property taxes.[62]

Transfer of Legislative Functions

Effective July 1, 1967, an Act of the Utah Legislature changed the WPCB to the Utah Committee on Water Pollution Control within the Division of Health. Committee members include the director of public health, or someone so designated, plus eight other members representing the state's industries and two members at-large. Officers are chosen by the committee, and an executive-secretary may be appointed at the discretion of the committee.[63]

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[61] Ibid., pp. 4 and 5.

[62] Ibid.

[63] Water Pollution Control Act, sec. 2.5 and 3 (1967 amendment).

According to a July, 1968, stipulation, conditions had changed since Valley Rendering et al. entered the appeal action in First District Court, and the court remanded the case to the Committee on Water Pollution. The committee was to reconsider standards and classification of waters of the Bear River system in Utah in light of two major changes.[64]

First, the alteration and modification of some waste discharges had caused significant progress in the matter of anti-pollution. This was due to conferences between parties to the case, and the installation of effective treatment facilities by several cities and industries involved. Secondly, the State of Utah would be required to submit interstate water quality standards to the Secretary of Interior under provisions of the Water Quality Act of 1965, which involves the federal government in such considerations.[65]

Congressional action in 1967-1968 consolidated water quality management and pollution control functions in the Interior Department.[66]

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[64]Valley Rendering Company v. State of Utah, "Stipulation."

[65]Water Quality Act, U.S. Statutes, Vol. 79 (1965).

[66]Ibid.

CONCLUSIONS

It was hypothesized that decision-making in Logan City would be initiated and shaped by three outside variables: demands made by state and national government; the interpretation or modification of statutes; and technology.

In other hypotheses it was stated that voters "muddled through" the decision-making process, and that policy reflected current, predominant local interests.

Demands by Government

This study has not shown that local action was an immediate and direct result of adoption of the Water Pollution Control Act which gave authority to the WPCB to demand that the city cease polluting state waters with untreated city wastes. WPCB requirements did influence the direction of action in 1955 when city officials first undertook measures to comply with Board rulings. Residents in the Island section of the city had agitated for some time for improved sewer services to alleviate conditions which threatened serious property damage. However, petitions to improve the existing sewer system were rejected by the Board until it appeared the city was prepared to construct a collection system and treatment facility which would provide over-all corrections.

By 1958 federal considerations became important after the United States Public Health Service protested the detrimental effects of pollution to interstate waters. PHS provided financial assistance and

technical advice so the WPCB could proceed with a formal classification of state waters. Otherwise, the national government maintained a "hands off" policy in the matter of Utah's water resources.

By 1961 the constitutionality of delegated authority had been challenged and the WPCB's control was seriously threatened. The Utah Municipal League and societies of professional engineers sponsored state legislation which would have delimited Board authority.

The League's position was that the WPCB should not dictate that a certain type of treatment facility be utilized by cities. This was said to be an infringement on the privileges of private engineering practice, and interference in purely municipal functions.

Attorneys for several industries and political subdivisions appealed a ruling of the Board in district court on similar grounds. Valley Rendering and others also questioned the "arbitrary and unreasonable" classification of state waters.

The supposition that interpretation of existing statutes shaped the local decisional process can be substantiated by noting the success of these challenges. Had WPCB regulations not subsequently been modified, Logan residents would not have been faced with a choice between two methods of sewage treatment.

While the Valley Rendering case was being continued, the Board could not levy fines against Logan City. Whether or not such harsh action would have been pursued is a matter for speculation.

Technology

A second hypothesis was taken from the assumption that the complexity of modern environmental planning caused local policy

formation to be shaped by standards of technology. The word "standards" is used here as a criterion of excellence.

Of special significance was the use of technical data by the WPCB. Bacterial and chemical analyses of water provided a basis for classification of waters in the Logan and Bear Rivers. The Board judged adequacy of sewage treatment facility according to proved engineering design and successful performance.

In an attempt to provide maximum protection of public health and the state's natural resources, the Board assumed a position on treatment facilities which proved untenable because some current technical data was neglected.

Regulations set by the Board were especially important to citizens in Logan by 1962, when a second bond proposal was presented. The evaluation and distribution of technical data were undertaken by laymen. Confusion resulted, and it may be said that a vote for sewage lagoons was, largely, a vote against a mechanical system.

The first bond issue was defeated by a two-to-one margin. In 1962 negative votes cast mainly in the southwest section barely defeated the issue. An education campaign favoring lagoons concentrated on the comparatively high cost of a mechanical system and charged that such a plant was being forced on the city by scare tactics.

With the exception of an explanation by the Dean of Engineering at USU that a high-priced mechanical plant was necessary to handle excessive infiltration in the Logan system, experts in the field of sanitation engineering withheld public comment as to the preferability of treatment methods. However, engineers and technicians at the University endorsed the bond issue because of the urgent need for any kind of corrective measures.

It has been noted that voters in the lower-income areas of the city did not approve the bond issues. Economic considerations probably had a more decisive effect on this election than the weight of professional opinion or the consideration of technical processes.

It can be said that technology underlined the necessity of providing treatment for Logan City's wastes. Evidence does not support the supposition that technology shaped policy formation.

However, technicians have assumed significant roles in policy formation on the state and local level since 1961. Representatives of professional societies assisted the WPCB in a revision of state standards. In 1963 Logan officials deferred to the Advisory Committee, guided by engineering instructors from Utah State, in the matter of retaining consultant engineers. And in 1965, the city's decision to construct a lagoon system was defended by professional engineers during a hearing before the WPCB.

Process of Government in Logan

This study did not successfully test the hypothesis that official policy reflected predominant local interests. A proposed test of such a supposition would involve more than this single interest. It can be said that the relation of officials to private citizens in effecting anti-pollution measures was reciprocal.

Several important matters which will affect future environmental planning in Utah received attention during the years between 1953 and 1965. It appears that Logan voters contributed much of the time necessary for these considerations by "muddling through" the political process for a decade.

SOURCES CONSULTED

Published Material

Arrington, Leonard J. "Life and Labor among the Pioneers." The History of a Valley. Edited by Joel E. Ricks and Everett L. Cooley. Salt Lake City, Utah: Deseret News Publishing Co., 1956.

Herald Journal (Logan, Utah). September 11, 17, 25, October 3, 6, 7, 9, 1957; October 30, November 1, 1959; October 18, November 3, 13, 1961; December 4, 6, 9, 11, 12, 1962; October 29, 31, November 3, 4, 6, 1963.

Peterson, William. "Physical Description and Geology." The History of a Valley. Edited by Joel E. Ricks and Everett L. Cooley. Salt Lake City, Utah: Deseret News Publishing Co., 1956.

Salt Lake Tribune (Salt Lake City, Utah). December 28, 1964.

Steel, Ernest W. Water Supply and Sewerage, 3rd ed. New York: McGraw-Hill, 1953.

Unpublished Material

Burrows, Smith and Co. "Logan City, Official Statement and Notice of Sale of General Obligation Bonds, Series October 1, 1966." Salt Lake City, Utah.

Cache Chamber of Commerce. "Clubs and Organizations in Cache Valley and Their Presidents." Logan, Utah, 1967-1968. (Mimeographed.)

Citizens Advisory Committee. "Questions and Answers Concerning Logan City's Bond Election." Logan, Utah, 1965. (Typewritten.)

Coates, Lawrence George, Orrice Stratford Murdock, and Kenneth Larry Tomlinson. "A Study of Opinions in Logan, Utah on National, International, State and Local Affairs." Unpublished MS thesis. Utah State University Library, Logan, Utah, 1960.

Cornell, Howland, Hayes, and Merryfield. "Engineering Report on Sewage Collection and Facilities for the City of Logan." Unpublished report, Boise, Idaho, 1964.

Cornell, Howland, Hayes, and Merryfield. "Literature Research and Proposed Waste Stabilization Pond Design Criteria." Unpublished preliminary report, Boise, Idaho, 1964.

Curtis, Warren D. Letter to Keith A. Hansen and others, February 19, 1964.

Ferro, A. M., Counsel to Utah Municipal League. Letter to author, August 16, 1968.

Hansen, Keith A. "Analysis and Commentary of the Published Position of the Utah Water Pollution Control Board on Oxidation Ponds." Unpublished report, Brigham City, Utah, January, 1963.

Hansen, Keith A. Letter to Harold A. Linke, April 22, 1964.

Linke, Harold A. Letter to Utah Water Pollution Control Board, February 1, 1965.

Thatcher, Lynn M. Letter to Keith A. Hansen, December 20, 1963.

Thatcher, Lynn M. Letter to H. Merrill Petersen, September 22, 1960.

Thompson, G. D. Carlyle, M.D. Letter to Dr. Hanson, December 23, 1964.

Public Documents

City of Logan. Minute Record, Board of Commissioners, Book L. Meetings of January 11, September 6, 1955; January 31, August 7, August 21, November 20, December 18, 1956; April 23, July 2, July 16, August 27, 1957; June 3, 17, 1958; February 17, March 10, April 21, May 19, September 15, 1959; February 28, 1961; October 24, November 6, December 11, 12, 18, 1962; December 24, 1964; January 18, 1965.

First Judicial District Court of Utah, Cache County. Valley Rendering Company v. State of Utah, Civil Case 9282. Minute Book 30, April 18, 1961.

State of Utah v. Valley Rendering Company, Civil Case 9123. File 1960. First Judicial District Court of Utah, Cache County.

U.S. Department of Agriculture. Handbook No. 60. Washington, D.C.: U.S. Government Printing Office, February, 1954, quoted in Utah. State Water Pollution Control Board. The Standards of Quality and the Regulations for Water Classification. Salt Lake City, Utah, February 24, 1955.

U.S. Department of Health, Education and Welfare. Conference on Interstate Pollution of Waters of the Bear River, First Session, October 8, 1958. Washington, D.C.: U.S. Government Printing Office, 1958.

U.S. Department of Health, Education and Welfare. Conference on Interstate Pollution of Waters of the Bear River, Second Session, July 19, 1960. Washington, D.C.: U.S. Government Printing Office, 1960.

U.S. Public Health Service. "Drinking Water Standards." Public Health Reports, Vol. 61, part 1, February 6, 1946, quoted in Utah. State Water Pollution Control Board. The Standards of Quality and the Regulations for Water Classification. Salt Lake City, Utah, February 24, 1955.

U.S. Public Health Service. Water Supply and Pollution Control Activities, Region VI. Proceedings of Symposium on Waste Stabilization Lagoons at Kansas City, Missouri, August 1-5, 1960. Washington, D.C.: U.S. Government Printing Office, 1960.

Utah. State Department of Health. Code of Waste Disposal Regulations, Part III, Sewers and Wastewater Treatment Works, 1954. Revised May 18, 1965. Salt Lake City, Utah.

Utah. State Department of Health. Summary of Meeting. Salt Lake City, Utah, July 26, 1963.

Utah. State Department of Health. Transcript of Public Hearing in the Matter of Adoption of Waste Disposal Regulations. Salt Lake City, Utah, January 5, 1965.

Utah. State Water Pollution Control Board. The Standards of Quality and the Regulations for Water Classification. Salt Lake City, Utah, February 24, 1955.

Utah. State Water Pollution Control Board. Transcript of Special Meeting. Salt Lake City, Utah, March 2, 1961.

Valley Rendering Company v. State of Utah, Civil Case 9282. File 1961. First Judicial District Court of Utah, Cache County.

Statutory Material

Utah. Constitution, Art. VI, sec. 29.

Utah. Senate. SB 17, 36th sess., Utah Legislature. Senate Journal, numerical index, 1965.

Water Pollution Control Act. Title 73, ch. 14, secs. 1-11. Utah Code Annotated, 1953 (1967 amendment).

Water Quality Act. U.S. Statutes. Vol. 79, 1965.

Interviews

Chambers, Mayor Richard A. Personal interview in Logan, Utah, October, 1968.

Hansen, Keith A. Personal interview in Brigham City, Utah, July, 1968.

Dr. E. L. Hanson. Personal interview in Logan, Utah, July, 1968.

Hugie, Ray. Personal interview in Logan, Utah, June, 1968.

Jones, Norman B. Personal interview in Logan, Utah, September, 1968.

Jones, Venal. Personal interview in Logan, Utah, May, 1968.

Judah, Mrs. George. Telephone interview in Logan, Utah, September, 1968.

Peterson, H. Merrill. Personal interview in Logan, Utah, June, 1968.

Roberts, Dr. Reed S. Personal interview in Logan, Utah, September, 1968.

Smith, Dean. Personal interview in Logan, Utah, July, 1968.

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