

CITY OF KEIZER MISSION STATEMENT
**KEEP CITY GOVERNMENT COSTS AND SERVICES TO A MINIMUM BY
PROVIDING CITY SERVICES TO THE COMMUNITY IN A
COORDINATED, EFFICIENT AND LEAST COST FASHION**

A G E N D A
KEIZER CITY COUNCIL

Monday, August 2, 1993

7:30 p.m.

**Robert L. Simon Council Chambers
Keizer City Hall
Keizer, Oregon 97303**

1. CALL TO ORDER

2. ROLL CALL

3. PUBLIC TESTIMONY

This time is provided for citizens to address the Council on matters not on the agenda.

4. COMMITTEE REPORTS

5. PUBLIC HEARINGS

- a. Keizer Little League Park Conditional Use
- b. Chemawa Activity Center (cont. from 7-6-⁹³92)
- c. Conditional Use Appeal - Chandler 91-9 (cont. from 9-21-92)
- d. Max Court Street Lighting District
- e. The Meadows Phase 6 Street Lighting District

6. DELIBERATION

- a. Keizer Little League Park Conditional Use and amendment of Park Regulations
- b. ORDINANCE - Max Court Street Lighting District
- c. ORDINANCE - The Meadows Phase 6 Street Lighting District

7. DISCUSSION

- a. Housing Issues

8. CONSENT CALENDAR

- a. RESOLUTION - Records Management Purchase
b. RESOLUTION - Membership in CCIS Insurance Pool
c. Unimproved Streets
d. Receipt of the Willow Lake Treatment Plan Noise and Odor Study
e. Approval of July 19, 1993 Regular Session Minutes

9. OTHER BUSINESS

This time is provided to allow Council members the opportunity to bring matters before the Council which are not on tonight's agenda.

10. WRITTEN COMMUNICATIONS

To inform the Council of significant written communications and petitions.

11. AGENDA INPUT

August 16, 1993

7:30 p.m. City Council Meeting

Clear Lake Area Comp Plan Land Use Map Amendment
Marion County Building/Planning Agreement
Marion County Street Maintenance Agreement
Unimproved Streets

September 7, 1993 (Tuesday)

7:30 p.m. City Council Meeting

ADA Self Evaluation Public Hearing

12. ADJOURN



City of Keizer

930 Chemawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 5a & 6a

TO: MAYOR AND CITY COUNCIL

THROUGH: DOTTY TRYK, *Dotty*
CITY MANAGER

FROM: JOHN N. MORGAN, AICP
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: CONDITIONAL USE CASE 93-8
KEIZER LITTLE LEAGUE

DISCUSSION:

At its meeting of July 6, 1993, the Council initiated this Conditional Use Application to allow placement of lights at the Little League Field. Since the Keizer Little League Field is a City park, the City is the applicant. As such, the matter is being brought directly to the Council for hearing and decision.

Attached to this report is a land use case staff report prepared by Skip Wendolowski, City Planner. It details the proposal, the criteria, and the analysis, conclusions, and recommendation. Attached to that report are relevant supportive materials.

RECOMMENDATION:

It is recommended that Council direct staff to return with an order for the Conditional Use to be considered at your August 16 meeting.

In addition, the Parks Regulations may require modification to specify the allowed uses of the lights. An amended ordinance will be on the August 16 agenda for Council consideration.

"Pride, Spirit and Volunteerism"

MEMORANDUM

TO: Keizer City Council

FROM: Walter J. Wendolowski, AICP; City Planner 

SUBJECT: Conditional Use Case No. 93-8; City of Keizer

DATE: July 28, 1993

The Planning staff reviewed the above noted case and offers the following comments.

I. FACTS

- A. **APPLICANT:** City of Keizer.
- B. **PROPERTY LOCATION:** The subject property is located on the west side of Ridge Drive just north of Keizer Road. The address is 5135 Ridge Drive and the County Assessor identifies the property as located within Section 36CD; Township 6 South; Range 3 West; Tax Lot #'s 101, 200 and 301; and, Section 01B; Township 7 South; Range 3 West; Tax Lot # 1201. (See EXHIBIT "A".)
- C. **PARCEL SIZE:** 21.42 acres.
- D. **EXISTING DEVELOPMENT:** The property contains the Keizer Little League Park and includes 10 playing fields used for both baseball and softball.
- E. **PLAN DESIGNATION AND ZONING:** The property is designated "Park" in the Keizer Comprehensive Plan and is zoned P (PUBLIC). The purpose of this Plan designation is provide land for public and semi-public uses. (See EXHIBIT "A".)
- F. **ADJACENT ZONING AND LAND USES:** Property to the north is zoned UT (URBAN TRANSITION) and is primarily developed with single family homes on large lot and acreage parcels. Land to the west is zoned UT and RS (SINGLE FAMILY RESIDENTIAL). This area contains both large lot homesites and residential subdivisions. To the south is RM (MEDIUM DENSITY RESIDENTIAL) and UT zoned land with the Kennedy Mobile Home Park the dominant land use. Ridge Drive and the Salem Parkway border the property to the east. (See EXHIBIT "A".)
- G. **PROPOSAL:** The applicant is requesting approval of a Conditional Use to install field lights at the park. (See EXHIBIT "B". This Exhibit includes both a conceptual layout of the park and the specific location of the proposed field lights as determined by the manufacturer.)

II. FINDINGS: CONDITIONAL USE

A. The Keizer Little League Park contains 10 playing fields on approximately 15 acres. The proposal calls for the installation of field lights at Reimann Field this year and anticipates lighting as many as four field over the next five years. These four additional fields are located in the center of the complex and include the Rotary Field, Kiwanas Field, Keizertimes Field and the Jerry Bull Field. The lights will be designed to direct light only onto the playing field and are shielded to eliminate the scattering of light onto adjacent areas.

B. Ball parks are identified as conditionally permitted uses in the P zone [Section 37.02(i)]. The proposed field lights are "accessory" to the existing baseball diamonds and will not establish new uses at the park. However, staff finds installation of the lights may change the way the fields are used and believes a conditional use review is appropriate. Comments in this report will address the installation of lights on all five fields by 1998.

C. The conditional use decision criteria are established in Section 8.30 of the Keizer Zoning Ordinance. The decision criteria, and staff findings, are reviewed below.

1. The use is listed as a conditional use in the zone.

As previously noted, Section 37.02(i) identifies ball parks as a conditionally permitted use in the P zone. Staff further determined the installation of lights may be reviewed under these provisions.

2. The parcel is suitable for the proposed use.

The property has been successfully operated as a baseball and softball facility for approximately 10 years. There is adequate area to install the lights and there are no physical features on the property that would prevent their installation.

3. The proposed use, as conditioned, will not materially alter the character of the area.

Staff is primarily concerned with two issues regarding the installation of field lights: lighting glare on adjacent property, and, a change in the use of facility.

The lights are specifically designed to direct light only onto the playing field. Similar lights were recently installed at the Holland Youth Park in east Salem. According to a memorandum (attached as EXHIBIT "C") from the City's Parks Director, these lights have proven to be "neighborhood-friendly" and are not expected to impact adjacent residences. The initial field (Reimann Field) is separated from adjacent residential uses by embankments and shielded by trees which further mitigates against possible impacts. The four remaining fields are located in the center of the complex and separated from adjacent residential property by at least 300 feet. These locations and distances, along with the lighting design, are expected to reduce or eliminate any impact on adjacent residential property.

Currently, the Little League Park closes at sunset. Lighting the fields will permit longer hours of operation and result in additional games. However, this action will not increase the number of games played nor the number of people at the Park at any one time. Therefore, while there may be more traffic over the entire period when the park is in use, the existing traffic pattern and flow generated by the park remain essentially unchanged. In addition, extended hours will be limited to only one field (and eventually no more than five fields) so that at the end of the day there will actually be less traffic leaving the site.

While unrealistic, games can be played 24 hours per day with a lighted field. For this reason, it is appropriate to establish a time limit for the operation of the facility (and lights). The City Parks Director recommended both time and seasonal limitations to operations at the Little League Park:

- (a) The park hours may be extended by lighting from March 1, to October 31.
- (b) The park will close, and the lights will be off, at 10:00 pm from March 1, to May 31, and, September 1, to October 31.
- (c) The park will close, and the lights will be off, at 11:00 pm from June 1, to August 31.
- (d) Extended hours are limited to Monday through Saturday; the park will close at sunset on Sundays.

Staff believes these are appropriate limitations and will add only an hour or two to the operation of the facility. It may be reasonable to extend item (c), above from September 1 to Labor Day in order to allow for Labor Day tournaments.

4. The proposed use will not adversely affect existing wind and solar energy systems.

Staff is not aware of any existing wind or solar energy systems in the area.

5. Adequate public utility facilities are available.

Electricity is available to power the lights. The City will not be required to extend new public facilities to the site.

D. Staff concludes the proposal complies with the conditional use criteria provided the installation is limited solely to the subject fields and conditions are placed on the hours of operation. Staff further notes extending the Park hours will require an amendment to City's Master Park Plan. It is our understanding these amendments will be brought before the City

Council at a future meeting. The Plan must be amended, however, before the lights can be used.

III. RECOMMENDATION

A. Staff recommends approval of the conditional use request subject to the placement of the following conditions:

1. Installation of the lights shall be limited to the following playing fields: Reimann Field, Rotary Field, Kiwanas Field, Keizertimes Field and the Jerry Bull Field.
2. The lights shall be designed and installed in a manner as to direct the lighting onto the field or fields they are intended to light.
3. The lights shall be installed within 5 years of the date of the final decision.
4. The operation for the Keizer Little League Park and field lights shall be limited to the following hours:
 - (a) The park hours may be extended by lighting from March 1, to October 31.
 - (b) The park will close, and the lights will be off, at 10:00 pm from March 1, to May 31; and, the day after Labor Day to October 31.
 - (c) The park will close, and the lights will be off, at 11:00 pm from June 1, to Labor Day.
 - (d) Extended hours shall be limited to Monday through Saturday; the park shall close at sunset on Sundays.
5. Prior to using the field lights, the Keizer Park Regulations shall be amended to include the change in hours of operation.

B. The Keizer Zoning Ordinance establishes specific development requirements. These requirements are mandatory and in some cases cannot be modified even through the variance or adjustment process. These requirements are included for the benefit of the applicant.

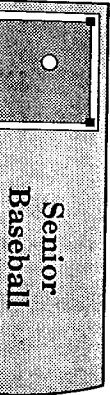
1. Development of the property shall comply with the applicable requirements of the Keizer Zoning Ordinance and building requirements of the Marion County Building Inspection Division.

EXHIBIT "B"

KEIZER LITTLE LEAGUE PARK

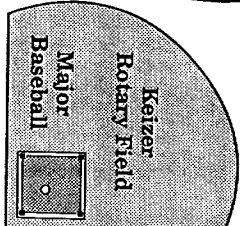


North ↓

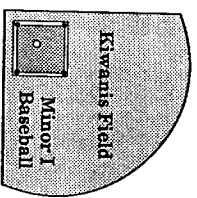


Reimann Field

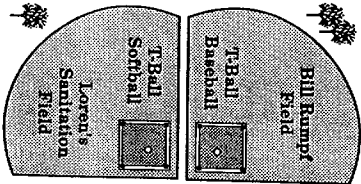
Senior Baseball



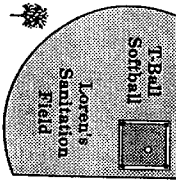
Keizer Rotary Field
Major Baseball



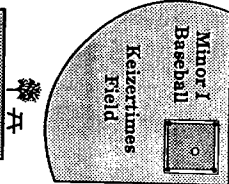
Kiwanis Field
Minor I Baseball



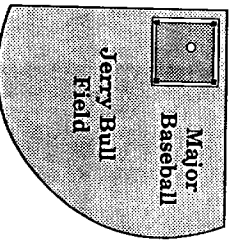
Bill Rumpf Field
T-Ball Baseball



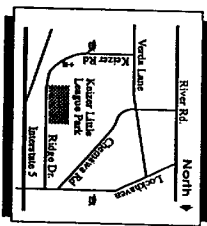
Loren's Sanitation Field
T-Ball Softball



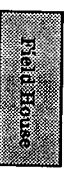
Minor I Baseball
Keizer Times Field



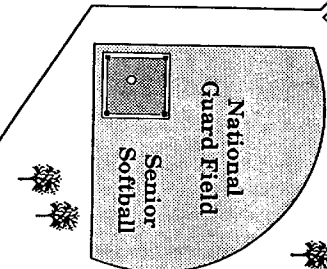
Major Baseball
Jerry Bull Field



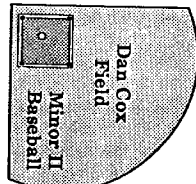
Concession Stand



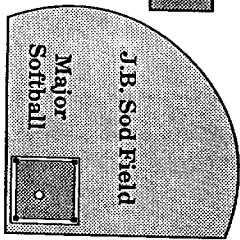
Field House



National Guard Field
Senior Softball



Dan Cox Field
Minor II Baseball



J.B. Sod Field
Major Softball

Parking

Parking

Main Entrance

Parking

Couches

Ridge Drive

**KEIZER LITTLE LEAGUE / REIMAN FIELD
300' BASEBALL FIELD 6 POLES 60' & 70' HIGH
COMPUTER LIGHT SCAN - MAINTAINED FC**

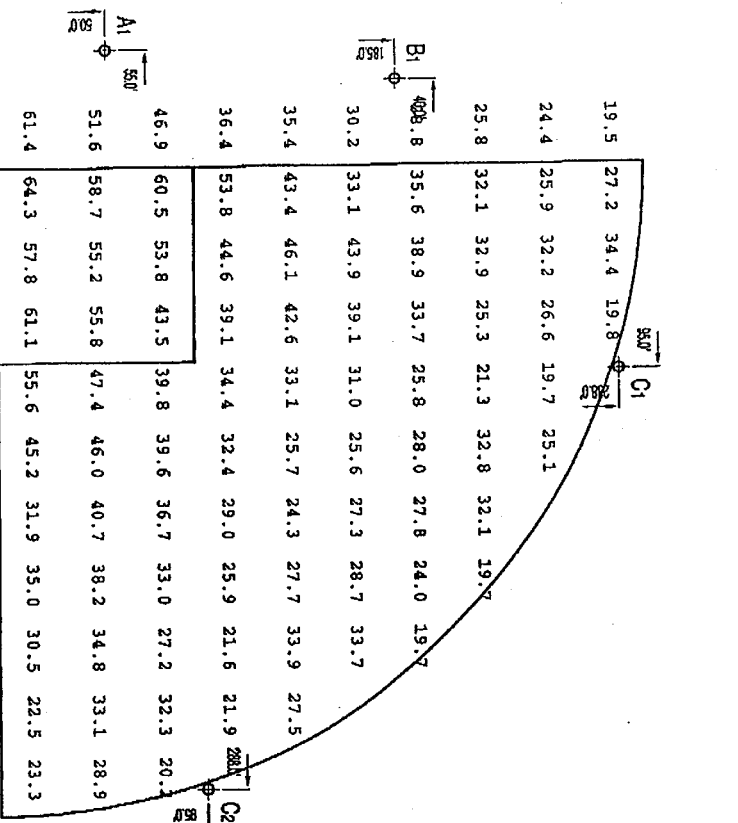


Figure Type: SC-2 NZ
Lamp Type: 500 Watt Metal Halide NZ
Lamp Wattage: 155000
File Number: CL300B2
Project: TRC15184
By: SLD
Date: 11-MAR-83



GUARANTEED PERFORMANCE

HORIZONTAL FOOTCANDLES

Outfield
Average: 50.19
Max/Avg: 50.21
Number of Poles: 2,859
Number of Limiters: 1,887
KW Consumption: 5
73,800

Field Dimensions: ☐ OK ☐ MODIFIED

Light Levels: ☐ ☐ ☐

Pole Locations: ☐ ☐ ☐

Voltage: ☐ ☐ ☐

POLE ID	MTG HT	FIGURES
A1	70	6
B1	70	12
C1	60	6
B2	70	6
A2	70	12
		6

This preliminary information is subject to confirmation and any modifications indicated.

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SCALE IN FEET

☉ = Pole Location



EXHIBIT "C"

Date: July 27, 1993
To: Skip Wendowlowski, City Planner
From: Kevin Wickman, Parks Director 
Subject: Keizer Little League Park Lighting

ISSUE

Shall the City allow selected ball fields at the Keizer Little League Park to be lighted? This will require an amendment to the conditional use of this property on the basis that lights could potentially change the way in which this facility is used.

ANALYSIS

The lights that are proposed for this park will be provided by MUSCO lighting. These lights are specifically designed to direct the light onto the field or fields that they are intended to light only. The lights are shielded by design to eliminate the scattering of light to unintended areas, and have proven to be very successful. The same lights have recently been installed at Holland Youth Park in east Salem, and have proven to be directional and very neighbor friendly.

Keizer Little League Park is a park of approximately fifteen total acres that has been almost exclusively used for little league ball play for a number of years. This park is bordered by the Salem Parkway to the east, farm acreage to the north, to the southwest is a church property, and to the west are a few single family dwellings that are largely hidden by trees.

The proposal is to light one field this year and as many as four more over the next five years. There are ten fields total at the park. The first field to be lit is Reiman Field, this is the largest field at the park. This field is bordered on two sides by earth banks that are planted with trees, the other sides of this field open to more ball fields. This field is the closest of the fields to be lit to any residences, but I do not believe that they will be in any way be impacted by the addition of field lighting. The four other fields for future lighting are located in the center of the park, these fields will not impact any neighboring properties.

CONCLUSION

Lighting the five fields at Keizer Little League Park will allow this park to be used and enjoyed by more Keizer residents without adding more fields or property for fields in the city. The basic activity in the park will not change or impact any additional properties, only the ability to extend the hours that this park is used will change.

The Keizer Parks Advisory Board has approved this proposal and is in agreement that this will allow the park to be used to a greater potential. (June 8, 1993 Parks Advisory Board minutes page 3 are attached)

RECOMMENDATION

Staff supports adding lights to Keizer Little League Park and would like to propose the following conditions of the Conditional Use Permit:

1. Keizer Little League Park may extend park hours by lighting from March 1 through October 31 of each year.
2. March 1 through May 31 and September 1 through October 31, the park will close at 10:00 PM and the lights will be off at that time.
3. June 1 through August 31, the park will close at 11:00 PM and the lights will be off at that time.
4. Sundays the park closes at sunset, no lights may be used.

With the combination of these conditions, the proposed five fields to be lit, and the type of lighting to be used, staff agrees that any changes in use of this park will not be significant and that no neighboring properties will be adversely impacted.

from a Rotary fundraiser. The Little League is planning to raise some of the money for the lights and finance the remainder.

Ed Bartlett moved the Parks and Recreation Board approve the proposal for lighting at the Little League field and the changes in Park Rules required and recommend it to the City Council. The motion was seconded by Rosalie Herber-Moore. The motion passed unanimously.

Councilor McGee thought the item might be on the agenda for the June 21st Council meeting. Mr. Wickman said he would send a letter to the Mayor and City Manager to be placed in the packets requesting action on the proposal. Chair Blake-Theiss requested a memo be sent from the Parks and Recreation Board signifying their support.

**Volunteer
Worker
Insurance**

Mr. Wickman reported on his research about insurance for Volunteer Workers. He found SAIF does cover volunteers, working both inside and outside. They want a list of names of the people involved and the dates and hours worked. He has developed a form which can be filled out to keep the records.

Other Items

Mr. Wickman passed out the budget sheets. He reported some work is proceeding at the Meadows. The fencing has been ordered and might be here in June or July. The bridge was completed at Willark Park by Cascade Landscaping. At present the mowing has been less frequent than usual. He also reported having new Parks Regulation signs made up.

... In the budget items, some money has gone for replacing chains on the swings and paint for the picnic tables. All the tables will eventually be painted this year. A volunteer continues to mow Sunset Park.

Mr. Wickman stated the Keizer Heritage contract was agreed upon in the Council meeting on Monday night. He assumed he would remain as staff custodian for that park area.

Mr. Wickman commented that in previous years, Parks and Recreation Board members had been assigned to parks. With new people on the Board the reassignment has not been done, and he felt it was a good idea. The Board discussed the function and makeup of the Natural Area Subcommittee.

**River's Edge
Park**

Mr. Wickman reported the City Council had voted to purchase River's Edge Park from the City of Salem for \$20,000. Mr. Wickman said he had walked the property



City of Keizer

930 Chemawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 5b

TO: MAYOR AND CITY COUNCIL

THROUGH: DOTTY TRYK, *Dotty*
CITY MANAGER

FROM: JOHN N. MORGAN, AICP
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: CHEMAWA ACTIVITY CENTER - CONTINUED PUBLIC HEARING

DISCUSSION:

This public hearing opened on July 6, 1993 and was continued until tonight. Staff is requesting the matter be further continued until August 16, 1993. Vacation and work load scheduling has led to this request. All property owners in the Activity Center have been informed of the change in hearing dates, however, they were also informed that they could provide testimony tonight if they desired.

RECOMMENDATION:

It is recommended the hearing be reopened and the Council receive any testimony. Then the hearing should be continued until August 16, 1993.



City of Keizer

930 Chemawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 5c

TO: MAYOR AND CITY COUNCIL

THROUGH: DOTTY TRYK *dottry*
CITY MANAGER

FROM: JOHN N. MORGAN, AICP *JN*
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: CONDITIONAL USE APPEAL - CHANDLER 91-9
(CONTINUED FROM 9/21/92)

DISCUSSION:

Conditional Use Case 91-9 involves the proposed placement of a church in the Special Policy Area surrounding the Willow Lake Treatment Plant. It was continued by the Council for one year so that the results of the Noise and Odor Study could be known and taken into account. However, it was recognized at the time that the study may not be completed by August 2, 1993 and that the hearing may need to be continued, again, for a short time.

The Noise and Odor study is being transmitted to Council this evening. However, no discussion or action is proposed to be taken. Detailed planning to implement the study is intended to be undertaken this coming Fall. Final recommendations may take until January to develop.

The applicant has, by letter (copy attached), requested a 90 day continuance of the hearing. The City of Salem has also requested an 90 day continuance. A copy of Salem's letter is attached. This delay will allow the Noise and Odor Study review to be initiated. It is possible that enough information will be available by November for Council action.

RECOMMENDATION

It is recommended the public hearing on Conditional Use Case 91-9 be continued until November 1, 1993.

"Pride, Spirit and Volunteerism"



MULTI
TECH
ENGINEERING SERVICES, INC.

CONSULTANTS
1155 13th Street, S.E.
Salem, Oregon 97302
(503) 363-9227

July 27, 1993

Mr. Skip Wendolowski
City of Keizer
Planning Department
P.O. Box 21030
Keizer, OR 97307-1030

RE: **Conditional Use 91-9**

Dear Skip:

This letter is intended to notify your office that Mr. Chandler is interested in continuing approval of Conditional Use 91-9.

We have made some attempts to obtain a copy of the Noise and Odor report prepared by the City of Salem that has caused the delay in the original decision.

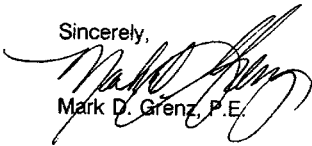
Today we are told that the report is not yet available for our review.

With out the report to review and discuss with the City of Salem Staff, it is not possible for our office your yours to make any logical decision on the matter at this time.

We therefore request that the hearing be continued for an additional 90 days to allow for our review of the report and discussions with the City of Salem on the matter.

If you have any questions, please contact our office.

Sincerely,



Mark D. Grenz, P.E.

B:\CHANDLER\ZCU-91-9.L1



CITY
OF SALEM,
OREGON

City Hall / 555 Liberty St. S.E.
Zip Code 97301-3503

PLANNING DIVISION
Room 305
Telephone (503) 588-6173
FAX (503) 588-6005

July 28, 1993

RECEIVED

'93 JUL 29 AM 11 13

Mayor and City Council
City of Keizer
930 Chemawa Road NE
P.O. Box 21000
Keizer, OR 97307-1000

CITY OF KEIZER
OREGON 97303

RE: Hearing on Proposed Church, 5400 Block Windsor Island Road

Dear Mayor and City Council:

Based on your schedule to continue the Public Hearing on August 2, 1993 for this proposal, Salem City Council has reviewed its position on this land use request. The Salem City Council adopted the recommendation described in the enclosed staff report, 9.2 g.

The City of Salem is interested in having the findings of the Willow Lake noise and odor study used in making the decision on the church proposal since the study will be available by August 2.

Thank you for your consideration in this matter.

Sincerely yours,

Roger J. Budke
Assistant Planning Administrator

Enclosure

cc: ~~John~~ Morgan, Director of Community Development, Keizer
Paul Eckley, Facilities Planning Engineer
Kenn Battaille, Planning Administrator
Jean Lay, City Recorder

FOR COUNCIL MEETING OF: July 26, 1993
AGENDA ITEM NO.: 9.2 g

TO: MAYOR AND CITY COUNCIL

THROUGH: LARRY WACKER, INTERIM CITY MANAGER *L. Wacker*

FROM: *Sal Selegard for*
RICHARD A. HAYDEN, ACTING DIRECTOR
COMMUNITY DEVELOPMENT

SUBJECT: PROPOSED CHURCH, WILLOW LAKE AREA OF INFLUENCE

ISSUE:

Should the City of Salem request the City of Keizer postpone, for 90 days, consideration of the conditional use application of a proposed church to be located at the 5400 block of Windsor Island Road. The postponement would allow both the City of Salem and the City of Keizer an opportunity to review the Willow Lake Treatment Plant Area of Influence odor and noise study (available to Council on August 2, 1993).

RECOMMENDATION:

The City Council request that the City of Keizer continue the hearing on the church's request for 90 days to allow consideration of the findings of the odor and noise study that will be available to both City Councils on August 2, 1993. If the City of Keizer chooses not to accommodate the 90-day postponement to review of this new environmental data, then the City of Keizer should deny the pending land use action.

POLICY DECISIONS:

Elements of the Salem Area Comprehensive Plan (Attachment 1) and the Willow Lake Treatment Plant dual interest area agreement (Attachment B to Attachment 2) establish City policy.

BACKGROUND:

In Spring 1992, a church applied for a conditional use necessary to locate in the 5400 Block of Windsor Island Road (located within the Willow Lake Treatment Plant Area of Influence). Council recommended that the City of Keizer deny the conditional use request

Proposed Church, Willow Lake Area of Influence

July 26, 1993

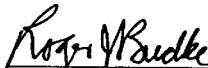
Page 2

in September of 1992, based on staff reports of August 24, 1992 and September 14, 1992 (Attachments 2 & 3).

Based on last Fall's expectation that an odor/noise study of the Willow Lake Treatment Plant Area of Influence would be completed in early June 1993, the Keizer City Council tabled the appeal of the conditional use denial until August 2, 1993.

FACTS AND FINDINGS:

1. The Willow Lake odor/noise study will be completed later than originally scheduled. It will be presented to Council on August 2, 1993.
2. The study will assist Council in determining whether to reaffirm the September 1992 action (denying the conditional use for the church's location on Windsor Island Road).
3. Two options exist at this point:
 - (a) Council can request that the City of Keizer postpone its decision regarding the church's variance for 90 days. This 90-day extension would allow both the City of Salem and the City of Keizer an opportunity to thoroughly review the Willow Lake odor and noise study, ascertaining if the findings contained therein have a bearing on the status of the church's conditional use request.
 - (b) Council has the option of reaffirming last September's decision on the conditional use denial.



Roger J. Budke
Assistant Planning Administrator

Attachments:

1. Salem Area Comprehensive Plan, page 23, Regional Policy I. Willow Lake Treatment Plant
2. Proposed Church, Willow Lake Area of Influence, August 24, 1992
3. Proposed Church, Willow Lake Area of Influence, September 14, 1992.

3. Changes to the Salem/Keizer urban growth boundary shall be based upon consideration of the following factors. This consideration does not include comparison of the proposed change with lands within the Salem/Keizer urban growth boundary.
 - a. Demonstrated need to accommodate long-range urban population growth requirements consistent with State land use goals.
 - b. Need for housing, employment opportunities and livability.
 - c. Orderly and economic provision for public facilities and services.
 - d. Environmental, energy, economic and social consequences.
 - e. Retention of agricultural land, as defined, with Class I being the highest priority for retention and Class VI the lowest priority.
 - f. Compatibility of the proposed urban uses with nearby agricultural activities.
 - g. Other criteria as required by the State Land Use Goals and Administrative rules.
4. If the Urban Growth Boundary for the Salem Urban Area is expanded to include additional land for residential development, first priority shall be given to lands that have been removed from the 1982 boundary.

H. TRANSPORTATION

1. The Salem/Keizer Area Transportation Study Cooperative Agreement shall provide the coordination mechanism for regional transportation issues within the Salem/Keizer urban growth boundary.

I. WILLOW LAKE TREATMENT PLANT

1. The Willow Lake Treatment Plant dual interest area is defined by an adopted legal description. Development requirements are established in the Willow Lake Treatment Plan dual interest area agreement.

J. SOLID WASTE

1. The disposal of solid wastes shall be accomplished with a minimal negative impact on the land, air and water resources of the region. A balanced program of waste reduction, recycling, resource recovery, landfill and other disposal methods shall be encouraged. The cities and counties shall participate cooperatively in the development of a solid Waste Management Plan for each county and participate in implementation of the plan to the extent it applies to each jurisdiction. The facilities developed to implement the Solid Waste Management Plans are not required to be located in the Salem/Keizer urban area.

FOR COUNCIL MEETING OF: August 24, 1992

AGENDA ITEM NO.: 7.2 F

TO: MAYOR AND CITY COUNCIL
THROUGH: GARY A. EIDE, CITY MANAGER *Gary Eide*
FROM: ROBERT BRISCOE, DIRECTOR *Robert Briscoe*
COMMUNITY DEVELOPMENT
SUBJECT: PROPOSED CHURCH, WILLOW LAKE AREA OF INFLUENCE

ISSUE

Considering the existing dual interest agreement, should the City of Salem concur in a City of Keizer Conditional Use (91-9) to permit a church within the Willow Lake Treatment Plant Area of Influence?

POLICY DECISIONS

Salem, Keizer, and Marion County have established a dual interest agreement regarding development in the vicinity of the Plant. Under the agreement:

Only those industrial, commercial, and agricultural and related uses that will not be adversely affected by the treatment plant noise and odor will be allowed.

This policy is in effect while the studies are being conducted to identify any noise and odor problems at the Plant. Such studies are to be completed by June 30, 1993, with the implementation of recommendations to follow, should they be required and subject to budget constraints.

The policy decision is, should the City of Keizer allow a church to locate inside the special policy area prior to completion of the study?

BACKGROUND

Salem, Keizer, and Marion County joined together in the dual interest agreement for the Area of Influence of the Willow Lake Treatment Plant based on a recognized need to identify any issues of odor and noise from the Plant and to subsequently define the level of mitigation effects.

The proposal is to establish a church in the 5400 Block of Windsor Island Road (Attachment A). The subject 6.22 acre property is within the Area of Influence and zoned Exclusive Farm Use (EFU) in Keizer.

Salem first received notice of this proposal in January 1992. Based on the dual interest agreement, Salem staff has recommended denial (Attachment B) at the two previous land use review levels (Administrative Review and review by

the Hearings Officer, and the proposal was denied at both of those levels. The proposal is currently under appeal to the Keizer City Council. Some members of the Keizer Council consider the matter an amendment to the dual interest agreement and request Salem's concurrence in making the amendment.

FACTS AND FINDINGS

Salem staff have made a general review of the conditions of approval proposed by the Keizer staff and referred by the Mayor of Keizer for consideration by Salem (Attachment C). The proposed conditions appear to be the type that are appropriate, however, there is no basis at present on which to determine if the conditions are sufficient to deal with the odor. The appropriate conditions may either be greater or lesser than the level of mitigation proposed.

DISCUSSION OF ALTERNATIVES

The Council's alternatives include the following:

Alternative 1. Advise Keizer that until the studies being conducted under the dual interest agreement are completed in June 30, 1993, there is insufficient information on which to make a decision.

This response is consistent with the intent of the dual interest agreement. When the studies are completed, conditions more in scale with the size of problems can be determined, with greater assurance of their appropriateness.

Alternative 2. Advise Keizer that the proposed Conditions of Approval (Attachment C) are sufficient for the church to proceed.

This alternative allows a development with sensitivity to noise and odor within the Area of Influence without taking time to gauge the proposal against the study results. The action sets a precedent that contradicts the intent of the dual interest agreement.

Alternative 3. Advise Keizer that the property may be partitioned, wherein the partitioning meets the code requirements of the Keizer codes, and such that the entire site for the church is outside the arc of the original one fourth mile radius from the plant and that the conditions cited in Attachment C are also applied to the parcel on which the church is to be located.

This alternative allows for the development of the church in an area that was initially excluded from the original definition of the area of influence.

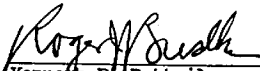
RECOMMENDATION

That Council adopt Alternative 3, which says:

that the property may be partitioned, wherein the partitioning meets the code requirements of the Keizer codes, and such that the entire site for the church is outside the arc of the original one fourth mile radius from the plant and that the conditions cited in Attachment C are also applied to the parcel on which the church is to be located,

however if Keizer is n willing to apply the conditions f Attachment C, then the Council should adopt Alternative 1, which says:

until the studies being conducted under the dual interest agreement are completed in June 30, 1993, there is insufficient information on which to make a decision.

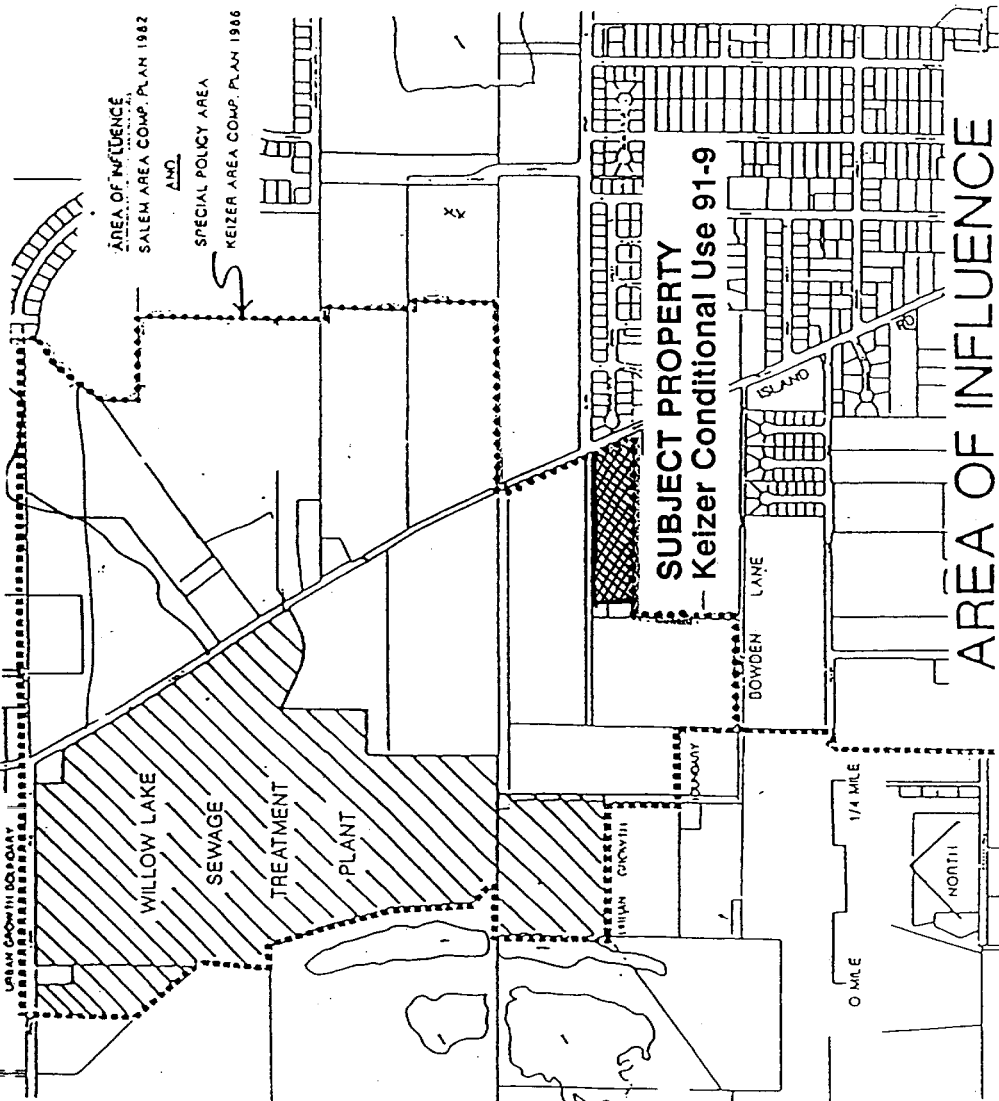

Kenneth P. Battaile
Planning Administrator

ATTACHMENTS:

- A. Location Map, Subject Property
- B. Salem Staff Response to City of Keizer, January 17, 1992
- C. Proposed Conditions of Approval, City of Keizer, August 17, 1992

10/2/92

7.2F



MEMORANDUM

TO: KEIZER COMMUNITY DEVELOPMENT DEPARTMENT
ATTENTION: JOHN MORGAN, DIRECTOR

FROM: ROGER J. BUDKE, ASSISTANT PLANNING DIRECTOR, CITY OF SALEM

DATE: JANUARY 17, 1992

SUBJECT: CONDITIONAL USE NO. 91-9, PROPOSED CHURCH IN EXCLUSIVE FARM USE (EFU) ZONE, 5400 BLOCK WINDSOR ROAD, KEIZER

We have reviewed the conditional use application No. 91-9 for a proposed church located in the Area of Influence of the Willow Lake Wastewater Treatment Plant. This being the same area referred to in the Keizer Comprehensive Plan as the "Special Policy Area (SPA)." Development in this area is a sensitive issue due to odor and noise impacts associated with the operation of the Willow Lake facility.

We conclude that the development of a church in the proposed location is inconsistent with adopted land use policy and therefore Conditional Use No. 91-9 should be denied. Our findings to support this conclusion are as follows:

1. A normal and frequent part of church use involves gatherings of large numbers of people within the church and on the church grounds. Concentrations of people are not compatible with odor and noise associated with the Willow Lake Wastewater Treatment Plant.
2. Church use is in the Area of Influence (i.e., SPA) is not consistent with the adopted land use policy of the Salem Area Comprehensive Plan (SACP), the Keizer Comprehensive Plan (an amendment to the SACP), and the Dual Interest Agreement for Willow Lake Treatment Plant Area (Attached). The pertinent policies regarding compatible land use are as follows:

a. Salem Area Comprehensive Plan, General Development Policy 19.

The Willow Lake Sewage Treatment Plant creates some conditions that are not compatible with all urban development and land uses. Only those land uses that will not be adversely affected by the conditions such as noise and odor shall be allowed in the affecting area. Agricultural uses, commercial-industrial warehousing, and other industrial and commercial uses, which are not labor intensive, are compatible with the treatment plant. Other uses may also be compatible if special provisions agreeable to the City are applied which adequately limit the City's liability.

b. Keizer Comprehensive Plan, West Keizer Special Policy Area Policy 1.a.

1. Establish an area, consistent with the Salem Area Comprehensive Plan Map, as a special policy area east of the Willow Lake Sewage Treatment Plant. The purpose of the special policy area is to:
 - a. Limit uses to those that will not be adversely affected by noise and odor originating at the Willow Lake Sewage Treatment Plant.

c. Dual Interest Area Agreement, Interim Control 3.a.

3. Until the above-noted studies are implemented, the following policies shall govern development within the area:
 - a. Only those industrial, commercial, and agricultural and related uses that will not be adversely affected by treatment plant noises and odor will be allowed.

d. Dual Interest Area Agreement, Regulation Procedure 4.

Quasi judicial procedural rights to notice and opportunity to comment shall be extended to the interested jurisdictions prior to any land use decisions in the area. Should disagreements arise, the SKAPAC conflict resolution process, or an agreed upon lesser process, shall be pursued prior to a final land use decision affecting the area.

ATTACHMENT: Dual Interest Area Agreement for Willow Lake Treatment Plant Area

DUAL INTEREST AREA AGREEMENT FOR WILLOW LAKE TREATMENT PLANT AREA

WHEREAS, the Salem/Keizer Area Comprehensive Plan provides for establishment of dual interest areas, land use decision making for which may be provided by agreement between affected jurisdictions; and

WHEREAS, Marion and Polk Counties and the Cities of Salem and Keizer have identified the area of the Willow Lake Treatment Plant as a dual interest area, and wish to establish the nature and scope of coordinated land use regulation in the area by dual interest area agreement.

NOW THEREFORE, Marion County and the Cities of Salem and Keizer, the parties having jurisdiction in the Willow Lake Treatment Plant Area, agree as follows;

1. Establishment of Willow Lake Sewage Treatment Plant Dual Interest Area

The Willow Lake Treatment Plant dual interest area is established and described by the legal description attached hereto and incorporated herein.

2. Study to Identify Allowed Uses and Land Use Controls

The three jurisdictions with an interest in the Willow Lake Treatment Plant Interest Area (hereinafter "Area") are the Cities of Keizer and Salem and Marion County. These jurisdictions shall participate jointly in studies to identify 1) those uses and improvements in the area that are compatible with treatment plant operation, 2) those land use policies that operate to minimize the adverse impact of allowed uses on the treatment plant, and 3) practical plant modifications that reasonably mitigate noise and odor. These studies shall be completed by June 30, 1993. Study recommendations should be implemented within a reasonable time thereafter.

3. Interim Controls

Until the above-noted studies are implemented, the following policies shall govern development within the area:

a. Only those industrial, commercial, and agricultural and related uses that will not be adversely affected by treatment plant noise and odor will be allowed.

b. Prior to the establishment of any use or issuance of any development/building permit, the affected property owner shall acknowledge the existence of nuisance impacts associated with the treatment plant and shall, in a signed and recorded document, hold the operator of the Willow Lake Treatment Plant harmless from any adverse impacts from noise or odor related to treatment plant operations.

c. Subdivision of parcels within the area shall not be allowed.

4. Regulation Procedure

Quasi judicial procedural rights to notice and opportunity to comment shall be extended to the interested jurisdictions prior to any land use decisions in the area. Should disagreements arise, the SKAPAC conflict resolution process, or an agreed upon lesser process, shall be pursued prior to a final land use decision affecting the area.

5. Amendments

Amendment to this dual interest agreement shall be in writing and approved by all parties to this agreement.

CITY OF KEIZER

By: [Signature]
Title: VMA402

Approved as to form:

[Signature]
City Attorney

MARION COUNTY

By: [Signature]
Title: Chairman

Approved as to form:

[Signature]
Marion County Counsel

CITY OF SALEM

[Signature]
Title: [Signature]

Approved as to form:

[Signature]
City Attorney

Tract No. 1
Inside UGB

Beginning at the section corner common to Sections 27, 28, 33, and 34, Township 6 South, Range 3 West, Willamette Meridian, City of Keizer, Marion County, Oregon, said point being on the now existing City Limits Line; thence North 89° 33' West along the South Line of said Section 28 a distance of 580 feet, more or less, to a point on the East Line of Windsor Island Road NE;
thence North 12° 34' West along the East Line of said Windsor Island Road NE 30 feet, more or less, to the point of intersection of the easterly extension of the North Line of County Road No. 605 (commonly known as Naples Street NE);
thence west along the easterly extension of the North Line and the North Line of said Naples Street NE 160 feet, more or less, to the point of intersection of the northerly extension of a tract of land conveyed to Clifford B., Jr., and Janice A. Bentson by instrument recorded in Reel 690, Page 138, Records, Marion County, Oregon;
thence South 0° 27' West along the northerly extension of the West Line and the West Line of said Bentson tract 238 feet, more or less, to the southwest corner thereof;
thence South 89° 33' East along the South Line of said Bentson tract 239 feet, more or less, to a point on the West Line of said Windsor Island Road NE, said point also being on the existing Keizer City Limits Line;
thence South 31° 28' East along the West Line of said Windsor Island Road NE 1,711.36 feet;
thence South 55° 48' West a distance of 97.03 feet;
thence along the arc of a 316.48-foot radius curve to the right (the chord of which bears South 86° 24' West 322.20 feet) 323.37 feet;
thence North 63° West 269.32 feet;
thence South 527.10 feet;
thence West 287 feet;
thence South 885 feet to a point on the South Line of a tract of land conveyed to PGE by instrument recorded in Reel 1, Page 721, Records, Marion County, Oregon;
thence west along the South Line of said PGE tract 250 feet, more or less, to the point of intersection of the northwest corner of a tract of land conveyed to Thomas W. and Inez Bowden by instrument recorded in Reel 742, Page 33, Records, Marion County, Oregon;
thence south along the West Line of said Bowden tract 1,048 feet, more or less, to the southwest corner thereof;
thence east along the South Line of said Bowden tract 445 feet, more or less, to the southeast corner thereof;
thence south along the southerly extension of the East Line of said Bowden tract 383 feet, more or less, to a point on the South Line of Bowden Lane NE;
thence east along the South Line of said Bowden Lane NE 709.03 feet to the southeast corner of a tract of land conveyed to David H. and Mary L. Wallace by instrument recorded in Reel 122, Page 1180, Records, Marion County, Oregon;
thence north along the East Line of said Wallace tract 662.56 feet to the northwest corner of a tract of land conveyed to Leonard E. and Lavelle Cook by

instrument recorded in Volume 671, Page 64, Deed Records, Marion County, Oregon;

thence east along the North Line of said Cook tract 1,220 feet, more or less, to a point on the West Line of said Windsor Island Road NE;

thence North 26° 45' West along the West Line of said Windsor Island Road NE a distance of 932 feet, more or less, to the point of intersection of the South Line of a tract of land conveyed to Arleen Olson, trustee by instrument recorded in No. 27606PCJ, Records, Marion County, Oregon;

thence east along the South Line of said Olson tract 1,245 feet, more or less, to the southwest corner of the Nimrod Ford Donation Land Claim No. 40, in Section 34, Township 6 South, Range 3 West, Willamette Meridian, Marion County, Oregon; also being the southeast corner of said Olson tract;

thence North 0° 9' 14" East 174.86 feet to the northeast corner of said Olson tract;
thence west along the North Line of said Olson tract 64.44 feet to the point of intersection of the East Line of a tract of land conveyed to Zillah Schooley, et al., by instrument recorded in Reel 697, Page 354, Records, Marion County, Oregon;

thence North 0° 7' East along the East Line of said Schooley tract 529.30 feet to the northeast corner thereof;

thence North 89° 30' West along the North Line of said Schooley tract 82.87 feet to the point of intersection of the East Line of a tract of land conveyed to Hayden Island, Inc., by instrument recorded in Reel 312, Page 1626, Records, Marion County, Oregon;

thence North 0° 38' East along the East Line of said Hayden Island, Inc., tract and the northerly extension of the East Line a distance of 1,158.01 feet to the northeast corner of a tract of land conveyed to John N. Olson, et al., by instrument recorded in Reel 133, Page 658, Records, Marion County, Oregon;

thence North 89° 22' West a distance of 543.87 feet to a re-entrant corner in the North Line of said Olson tract;

thence North 0° 35' East 235.83 feet to the point of intersection of the most easterly East Line of a tract of land conveyed to John W. and Barbara B. Weeks, et al., by instrument recorded in Reel 685, Page 462, Records, Marion County, Oregon;

thence North 38° 31' East 360.83 feet;

thence North 57° 27' East 203.10 feet;

thence North 0° 38' East 66 feet to the northeast corner of the James Smart Donation Land Claim No. 42 in Section 34, Township 6 South, Range 3 West, Willamette Meridian, Marion County, Oregon, said point being on the section line common to Sections 27 and 34 of Township 6 South, Range 3 West, Willamette Meridian, Marion County, Oregon;

thence west along the North Line of said Section 34 a distance of 1,676.64 feet to the southwest corner of the Alvis Smith Donation Land Claim No. 69 in Section 27, Township 6 South, Range 3 West, Willamette Meridian, Marion County, Oregon;

thence North 89° 37' 30" West 502.20 feet to the point of beginning.



City of Keizer

Administration

930 Chemawa Rd. N.E. • P.O. Box 21000

Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 390-8295

August 17, 1992

R.G. Anderson-Wyckoff, Mayor
City of Salem
555 Liberty Street SE
Salem, OR 97301

Dear Mayor Anderson-Wyckoff:

RE: Keizer Conditional Use Case 91-9 - Chandler

Kenn Battaile, your Planning Administrator, testified before us on this conditional use case on August 3, 1992. Mr. Battaile was in opposition, arguing that this proposed church was not appropriate in the Special Policy Area, and that it violated the Willow Lake Dual Interest Agreement.

Our Council believes conditions can be placed on the church so that it can meet the contested provision of the agreement. This provision reads: "Only those...uses that will not be adversely affected by treatment plant noise and odor will be allowed."

Our respective Staffs have met and created a proposed list of conditions. A copy of the list is attached. Our Council reviewed these at today's Council meeting and found that their implementation will allow the church to be established and still meet the provisions of the dual interest agreement.

I ask the Salem City Council to make the same finding so that we can allow the proposed church to proceed.

Your time and consideration is appreciated.

Sincerely,

Andrew J. Orcutt,
Mayor

cc: City Council
Don Otterman, City Manager
John Morgan, Community Development Director
Dan Chandler, Applicant

ATTACHMENT C

"Pride, Spirit and Volunteerism"

Proposed Conditions of Approval Conditional Use Case 91-9 (Chandler)

1. The applicant shall prepare an agreement between himself and the Cities of Keizer and Salem with the following provisions:
 - a. The agreement shall be entered into between Dan Chandler and Keizer Free Methodist Church; and any and all successors and assigns, (applicants) and the City of Keizer and the City of Salem (cities).
 - b. Applicants shall hold the operator of the Willow Lake Treatment Plant, and the cities, harmless from any adverse impacts from noise or odor related to treatment plant operations.
 - c. Applicants, including the property owner, the church as a corporate body, and any officer or representative of the church speaking on behalf of the church or its congregation, shall not raise any complaint about the Willow Lake Treatment Plant or its operations with the cities or any agency of the county, state, or federal government.
 - d. The agreement shall acknowledge that the operation and impacts of the Willow Lake Treatment Plant may change over time, and that such changes do not change the underlying conditions, provisions or requirements of the agreement.
 - e. Applicants shall require that any subsequent owner or operator of the property or the church enter into a new agreement with the cities.
 - f. The agreement shall be signed by all parties and recorded with Marion County.
 - g. The applicant shall prepare this agreement, subject to approval as to form by the City Attorney of each city.
2. The church building and accessory buildings, and all outdoor activities other than parking, shall be located within 300 feet of Windsor Island Road.
3. All buildings shall be equipped with a heating, ventilation, and air conditioning system that will filter odors from the outside air in particular hydrogen sulfide.
4. All buildings shall be fully insulated in the walls and ceilings and shall have fixed, non-operable double pane windows so that all outside noises are eliminated or muffled.

5. The number of parking spaces shall be limited to 100.
6. All buildings shall be limited to a maximum footage of 7,000 square feet.
7. No outside user, such as a club, organization, or business, shall be allowed to use the facilities. No day care facility or operation, regardless of the operator, shall be allowed on the site.

For Council Meeting Of: September 14, 1992

Agenda Item No.: 7.2.e

TO: MAYOR AND CITY COUNCIL
THROUGH: GARY A. EIDE, CITY MANAGER *Gary Eide*
THROUGH: STEPHANIE SMYTHE, CITY ATTORNEY *SPK For*
FROM: DAVID J. DE MARTINO, DEPUTY CITY ATTORNEY *DJM*
SUBJECT: PROPOSED CHURCH, WILLOW LAKE AREA OF INFLUENCE

BACKGROUND:

The Common Council has taken under advisement whether it should concur in a City of Keizer conditional use to permit a church within the Willow Lake Treatment Plant area of influence. In assisting the Council in reaching its decision the question has been raised whether an indemnity agreement between the church and the City required as an additional condition would provide a measure of protection to the City. The church would indemnify the City for any noise or odor at the treatment plant causing harm to the church or anyone using the church property.

The type of indemnity agreement needed by the City is harsh in terms and not particularly favored by the courts. The basic principle underlying indemnity agreements is that the party in control of conditions that cause the loss indemnifies the party with no control.

Here, the reverse occurs. The person with no control (church) must indemnify the person in control (City) against the negligence of the person in control (City). Such indemnifications are unusual and therefore any agreement must clearly state that the church has weighed the risks of indemnity arising from the City's negligence or failure to properly control the emission of odor or noise from the City's property.

Even if the court were to uphold the terms of indemnification, a court may set aside the agreement if the negligent activity is wanton or criminal in nature. Travelers Indemn. v. American Ins., 278 OR 193, 197 (1977).

"Wanton" conveys several meanings. In the area of negligence it means gross negligence. This is the equivalent of the reckless disregard of others. Fassett v. Santiam Loggers, Inc., 267 OR 505 (1973).

If the odor or noise reached a level amounting to a nuisance and there is available technology to remedy the situation, a court

might hold that the City is acting wantonly in not abating the odor and noise, and therefore refuse to enforce the indemnity provision.

Another issue is the charter limitation under section 24, which prohibits a contract for a longer period than five years. The City's sole obligation under the agreement is to support Keizer's approval of the conditional use. This obligation will be performed within five years. Therefore, no violation of the charter limitation occurs. As an additional precaution, any agreement should specifically provide that the indemnity agreement is a burden which runs with the land as a covenant. The indemnity provision would not be subject to the contract limitation imposed upon the City and would bind successor holders of the property. Any agreement would need to be carefully drafted to sustain any court challenge on whether the indemnity agreement is a covenant which binds the land.

Of course, any lawsuit for noise or odor nuisance is too important to leave to a church to defend in the first instance. The City would need to defend and seek to hold the church or its successor in interest for any judgment of the court including costs. However, there is no assurance that the church or its successor has the financial resource to respond to any judgments. An individual could seek money damages or injunctive relief for abatement of any odor or noise. Abatement costs could be more costly than any money judgment.

In conclusion, an indemnity agreement protecting the City from its own negligent action is probably enforceable except any noise or odor emission which is determined to be the result of wanton conduct by the City. However, it is doubtful in a practical sense that the church has the financial resources to give real meaning to any such indemnity agreement.

RECOMMENDATION:

Information Only.



City of Keizer

930 Chemawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

COUNCIL MEETING: August 2, 1993

AGENDA ITEM NO.: 5d & 6b

TO: MAYOR KOHO AND CITY COUNCIL

FROM: DOTTY TRYK *Dottry*
CITY MANAGER

THROUGH: TRACY L. DAVIS *Tracy*
CITY RECORDER

SUBJECT: PUBLIC HEARING - To consider remonstrances to an Ordinance spreading assessments to Max Court Street Lighting Local Improvement District

ISSUE

Scheduled is a public hearing to receive remonstrances to Max Court Street Lighting Local Improvement District and subsequent consideration of an Ordinance spreading assessments to the district.

BACKGROUND

In August of 1987, the Keizer City Council adopted Ordinance 87-094 relating to formation of street lighting districts within the City of Keizer.

In April of 1993, the developer of Max Court filed a petition for a local improvement district to form a street lighting district. In response to this petition, the City Council adopted Resolution R93-637 on May 17, 1993 to initiate a street lighting district and directing the City Engineer to make a survey and file a written report with the City Recorder. On June 21, 1993 the City Council approved the City Engineer's report and set a public hearing to consider remonstrances to the project. On July 9, 1993 notice of the public hearing and intention to assess for the lighting improvements, as required under Ordinance 87-094, were provided by mail to the property owners and to the Keizertimes newspaper for publication.

"Pride, Spirit and Volunteerism"

ANALYSIS

Included within the agenda packet is the Ordinance to spread assessments to the properties benefitted by the lighting district. The Ordinance provides for first annual estimated assessments and the method for determining second and future annual assessments. Following the City Council's adoption of the Ordinance spreading assessments, the City Manager authorizes the appropriate utility company to install the poles and lights. Depending on the type of poles requested by the City, it takes the utility company from two to six months to have the lights on site and operational.

FISCAL IMPACT

There will be no direct fiscal impact on the City of Keizer. The operating cost of the lights will be billed to the property owners on an annual basis, recovering the City's costs in paying the bills throughout the year. In addition, the bills include the cost of the Engineer's report in the first year, and a 10% administrative charge in the first and subsequent years to recover the City's cost for administering the lighting districts. All funds are budgeted through the Utility Fund.

RECOMMENDATION

1. Open the public hearing to consider oral and written remonstrances to formation of Max Court Street Lighting Local Improvement District.
2. If valid remonstrances of the owners of two-thirds of the land to be specially assessed for the lighting district are presented to the Council at the public hearing, close the hearing and suspend formation of the district for six months.
3. If valid remonstrances of the owners of two-thirds of the land to be specially assessed for the lighting district are not presented to the Council at the public hearing, close the hearing and consider adoption of the ordinance spreading assessments to the district.

1 BILL NO. _____
2
3

ORDINANCE NO. 93- _____

4 A BILL FOR
5

6 AN ORDINANCE SPREADING ASSESSMENTS TO
7 MAX COURT STREET LIGHTING LOCAL IMPROVEMENT DISTRICT
8
9

10 SECTION 1.

11 WHEREAS, the City Council did heretofore declare its intention to install street lights
12 to serve an area known as Max Court Street Lighting District which is described as follows:

13 Max Court (Lots 1, 2, 3, 4, 5, 8, 9, 10, 11 and 12), in Section 34, Township 7
14 South, Range 3 West, W.M., in the city of Keizer, Marion County, Oregon
15

16 which includes the installation of three (3) 100-watt high pressure sodium luminaries on four foot
17 long mast arms, and attached to 25 foot aluminum poles located within the subject local
18 improvement district, all in accordance with the City Engineer's report for Max Court Street
19 Lighting Local Improvement District and estimates heretofore duly and regularly adopted by the
20 City Council, which are hereby referred to and made a part hereof, and did fix the time and
21 place for hearing protests against the installation of said improvements, and the assessment and
22 the cost thereof, as aforesaid and

23 WHEREAS, notice was duly mailed and published as required by Ordinance; and

24 WHEREAS, a meeting of the City Council was held at the time and place fixed by public
25 notice for the purpose of considering any such protest and at that time heard and considered all
26 protests submitted relating to the proposed improvements and assessment thereof, and said
27 Council has considered the matter and deeming that construction of said improvements was and
28 is of material benefit to the City, and all the property to be assessed therefore will be benefited
29 by the improvements to the extent of a per parcel first annual assessment estimated at \$70.26

1 at the time of the City Engineer's report, did order the construction of said improvements; and

2 WHEREAS, the estimated first annual cost of said improvements has been preliminarily
3 determined to be the sum of \$702.57.

4 NOW, THEREFORE, the City Council of the City of Keizer ordains as follows:

5 **SECTION 2.**

6 (a) First Annual Assessment. It is hereby determined that the first annual estimated
7 proportionate share of the cost of said improvements, on each parcel and property benefited
8 thereby, is the amount set opposite the description of each piece or parcel of land as described
9 in Max Court Lighting District Assessment Roll as set forth in Exhibit "A" attached, and that
10 each piece or parcel of land benefited by the improvements, to the full extent of the amount so
11 set opposite such piece or parcel and that the respective amounts represent the proportionate
12 benefits of said improvements to said respective parcels of property, and the Council does
13 hereby declare that each of the parcels of property described in Max Court Street Lighting
14 District Roll as set forth in Exhibit "A" attached is hereby assessed the first annual estimated
15 amount set opposite each respective description.

16 (1) Summary of first annual costs assessed for formation of the lighting district to
17 serve the area known as "Max Court Street Lighting Local Improvement
18 District":

19 3 - 100 Watt Luminaries & Aluminum Poles	\$ 510.96
20 Annual Operations Costs (10%) **	127.74
21 Preparation of Engineer's Report	<u>\$63.87</u>
22 Total First Annual Costs	\$ 702.57

23 ** Includes tax roll preparation, audit, tax delinquencies, and

1 miscellaneous.

2 (2) The Recorder of the City of Keizer is hereby directed to send a notice of first
3 annual assessment to each owner of assessed property by Registered or Certified
4 mail within ten (10) days after the Ordinance levying the first annual installments
5 has been passed, and to publish notice of the first annual assessment twice in a
6 newspaper of general circulation in the city. The first publication of notice shall
7 be not later than 20 days after the date of the assessment ordinance pursuant to
8 City of Keizer Ordinance 87-094.

9 (b) Second and Subsequent Annual Assessments. After a municipal lighting district has been
10 formed in accordance with City of Keizer Ordinance 87-094, the second and subsequent annual
11 assessments shall be spread by Resolution which may include changes in the mode of collecting
12 the assessment. The method of assessment and notification for subsequent annual assessments
13 shall be determined in accordance with City of Keizer Ordinance 87-094.

14 (c) Mode of Collecting Assessments. Assessments for said lighting district shall be collected
15 pursuant to ORS 223.866.
16

17 PASSED this _____ day of _____, 1993

18 SIGNED this _____ day of _____, 1993
19

20 _____
21 Mayor
22

23 _____
24 City Recorder

EXHIBIT A

NOTICE OF ASSESSMENT

NOTICE IS HEREBY GIVEN that the City Council of the City of Keizer, Oregon, on August 2, 1993 adopted Ordinance No. 93-_____, entitled, AN ORDINANCE SPREADING ASSESSMENTS TO MAX COURT STREET LIGHTING LOCAL IMPROVEMENT DISTRICT.

In accordance with that ordinance, you are hereby given NOTICE of an ASSESSMENT on your property.

The record owners, description of the assessed properties and assessments are:

ASSESSMENT NO. 1

Robert and Cynde Alt
3505 Jack Street N.
Keizer, Oregon 97303

Lot 1
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 2

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 2
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 3

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 3
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 4

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 4
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 5

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 5
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 6

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 8
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 7

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 9
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 8

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 10
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 9

Print-Tek West Inc.
2746 Front Street NE
Salem, Oregon 97303

Lot 11
Max Court
First Annual Assessment: \$70.26

ASSESSMENT NO. 10

Robert and Cynde Alt.
3505 Jack Street N
Keizer, Oregon 97303

Lot 12
Max Court
First Annual Assessment: \$70.26

In accordance with City of Keizer Ordinance 87-094, said assessment will be placed on the Assessment Rolls of the Marion County Assessor and collected pursuant to ORS 223.866 by the Marion County Tax Collector at the same time and in the same manner as your annual property taxes. Failure to pay said assessment when due may subject your property to foreclosure proceedings.

Second and subsequent annual assessment amounts against the above described property will be determined annually, based upon electrical consumption and operating costs within Max Court Street Lighting Local Improvement District.

If you have any questions regarding this Notice of Assessment, please contact the City of Keizer, 390-3700.

Senior citizens age 62 or older, under certain conditions, may file for a property tax deferral on payment of the assessment. If you have questions on the property tax deferral program, please call the Oregon Department of Revenue, 371-2244.



City of Keizer

930 Chernawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

COUNCIL MEETING: August 2, 1993

AGENDA ITEM NO.: 5e & 6c

TO: MAYOR KOHO AND CITY COUNCIL

FROM: DOTTY TRYK *Dottry*
CITY MANAGER

THROUGH: TRACY L. DAVIS *Tracy*
CITY RECORDER

SUBJECT: PUBLIC HEARING - To consider remonstrances to an Ordinance spreading assessments to The Meadows Phase 6 Street Lighting Local Improvement District

ISSUE

Scheduled is a public hearing to receive remonstrances to The Meadows Phase 6 Street Lighting Local Improvement District and subsequent consideration of an Ordinance spreading assessments to the district.

BACKGROUND

In August of 1987, the Keizer City Council adopted Ordinance 87-094 relating to formation of street lighting districts within the City of Keizer.

In April of 1993, the developer of The Meadows Phase 6 filed a petition for a local improvement district to form a street lighting district. In response to this petition, the City Council adopted Resolution R93-638 on May 17, 1993 to initiate a street lighting district and directing the City Engineer to make a survey and file a written report with the City Recorder. On June 21, 1993 the City Council approved the City Engineer's report and set a public hearing to consider remonstrances to the project. On July 9, 1993 notice of the public hearing and intention to assess for the lighting improvements, as required under Ordinance 87-094, were provided by mail to the property owners and to the Keizertimes newspaper for publication.

"Pride, Spirit and Volunteerism"

ANALYSIS

Included within the agenda packet is the Ordinance to spread assessments to the properties benefitted by the lighting district. The Ordinance provides for first annual estimated assessments and the method for determining second and future annual assessments. Following the City Council's adoption of the Ordinance spreading assessments, the City Manager authorizes the appropriate utility company to install the poles and lights. Depending on the type of poles requested by the City, it takes the utility company from two to six months to have the lights on site and operational.

FISCAL IMPACT

There will be no direct fiscal impact on the City of Keizer. The operating cost of the lights will be billed to the property owners on an annual basis, recovering the City's costs in paying the bills throughout the year. In addition, the bills include the cost of the Engineer's report in the first year, and a 10% administrative charge in the first and subsequent years to recover the City's cost for administering the lighting districts. All funds are budgeted through the Utility Fund.

RECOMMENDATION

1. Open the public hearing to consider oral and written remonstrances to formation of The Meadows Phase 6 Street Lighting Local Improvement District.
2. If valid remonstrances of the owners of two-thirds of the land to be specially assessed for the lighting district are presented to the Council at the public hearing, close the hearing and suspend formation of the district for six months.
3. If valid remonstrances of the owners of two-thirds of the land to be specially assessed for the lighting district are not presented to the Council at the public hearing, close the hearing and consider adoption of the ordinance spreading assessments to the district.

1 BILL NO. _____
2
3

ORDINANCE NO. 93- _____

4 A BILL FOR
5

6 AN ORDINANCE SPREADING ASSESSMENTS TO
7 THE MEADOWS PHASE 6 STREET LIGHTING LOCAL IMPROVEMENT DISTRICT
8
9

10 SECTION 1.

11 WHEREAS, the City Council did heretofore declare its intention to install street lights
12 to serve an area known as The Meadows Phase 6 Street Lighting District which is described as
13 follows:

14 The Meadows Phase 6 (Lots 1 through 31), in Section 34, Township 7 South,
15 Range 3 West, W.M., in the city of Keizer, Marion County, Oregon
16
17 which includes the installation of nine (9) 100-watt high pressure sodium luminaries on four foot
18 long mast arms, and attached to 25 foot aluminum poles located within the subject local
19 improvement district, all in accordance with the City Engineer's report for The Meadows Phase
20 6 Street Lighting Local Improvement District and estimates heretofore duly and regularly
21 adopted by the City Council, which are hereby referred to and made a part hereof, and did fix
22 the time and place for hearing protests against the installation of said improvements, and the
23 assessment and the cost thereof, as aforesaid and

24 WHEREAS, notice was duly mailed and published as required by Ordinance; and

25 WHEREAS, a meeting of the City Council was held at the time and place fixed by public
26 notice for the purpose of considering any such protest and at that time heard and considered all
27 protests submitted relating to the proposed improvements and assessment thereof, and said
28 Council has considered the matter and deeming that construction of said improvements was and
29 is of material benefit to the City, and all the property to be assessed therefore will be benefited

1 by the improvements to the extent of a per parcel first annual assessment estimated at \$85.36
2 at the time of the City Engineer's report, did order the construction of said improvements; and

3 WHEREAS, the estimated first annual cost of said improvements has been preliminarily
4 determined to be the sum of \$2,646.27.

5 NOW, THEREFORE, the City Council of the City of Keizer ordains as follows:

6 **SECTION 2.**

7 (a) First Annual Assessment. It is hereby determined that the first annual estimated
8 proportionate share of the cost of said improvements, on each parcel and property benefited
9 thereby, is the amount set opposite the description of each piece or parcel of land as described
10 in The Meadows Phase 6 Lighting District Assessment Roll as set forth in Exhibit "A" attached,
11 and that each piece or parcel of land benefited by the improvements, to the full extent of the
12 amount so set opposite such piece or parcel and that the respective amounts represent the
13 proportionate benefits of said improvements to said respective parcels of property, and the
14 Council does hereby declare that each of the parcels of property described in The Meadows
15 Phase 6 Street Lighting District Roll as set forth in Exhibit "A" attached is hereby assessed the
16 first annual estimated amount set opposite each respective description.

17 (1) Summary of first annual costs assessed for formation of the lighting district to
18 serve the area known as "The Meadows Phase 6 Street Lighting Local
19 Improvement District":

20 9 - 100 Watt Luminaries & Aluminum Poles	\$ 1,924.56
21 Annual Operations Costs (10%) **	481.14
22 Preparation of Engineer's Report	<u>\$240.57</u>
23 Total First Annual Costs	\$ 2,646.27

** Includes tax roll preparation, audit, tax delinquencies, and miscellaneous.

(2) The Recorder of the City of Keizer is hereby directed to send a notice of first annual assessment to each owner of assessed property by Registered or Certified mail within ten (10) days after the Ordinance levying the first annual installments has been passed, and to publish notice of the first annual assessment twice in a newspaper of general circulation in the city. The first publication of notice shall be not later than 20 days after the date of the assessment ordinance pursuant to City of Keizer Ordinance 87-094.

(b) Second and Subsequent Annual Assessments. After a municipal lighting district has been formed in accordance with City of Keizer Ordinance 87-094, the second and subsequent annual assessments shall be spread by Resolution which may include changes in the mode of collecting the assessment. The method of assessment and notification for subsequent annual assessments shall be determined in accordance with City of Keizer Ordinance 87-094.

(c) Mode of Collecting Assessments. Assessments for said lighting district shall be collected pursuant to ORS 223.866.

PASSED this _____ day of _____, 1993

SIGNED this _____ day of _____, 1993

Mayor

City Recorder

EXHIBIT A

NOTICE OF ASSESSMENT

NOTICE IS HEREBY GIVEN that the City Council of the City of Keizer, Oregon, on August 2, 1993 adopted Ordinance No. 93-_____, entitled, AN ORDINANCE SPREADING ASSESSMENTS TO THE MEADOWS PHASE 6 STREET LIGHTING LOCAL IMPROVEMENT DISTRICT.

In accordance with that ordinance, you are hereby given NOTICE of an ASSESSMENT on your property.

The record owners, description of the assessed properties and assessments are:

ASSESSMENTS NO. 1 through 31

The Meadows Group DBA
P.O. Box 21209
Keizer, Oregon 97307

Phase 6 Lots 1 - 31
The Meadows Phase 6
First Annual Assessment: \$85.36

In accordance with City of Keizer Ordinance 87-094, said assessment will be placed on the Assessment Rolls of the Marion County Assessor and collected pursuant to ORS 223.866 by the Marion County Tax Collector at the same time and in the same manner as your annual property taxes. Failure to pay said assessment when due may subject your property to foreclosure proceedings.

Second and subsequent annual assessment amounts against the above described property will be determined annually, based upon electrical consumption and operating costs within The Meadows Phase 6 Street Lighting Local Improvement District.

If you have any questions regarding this Notice of Assessment, please contact the City of Keizer, 390-3700.

Senior citizens age 62 or older, under certain conditions, may file for a property tax deferral on payment of the assessment. If you have questions on the property tax deferral program, please call the Oregon Department of Revenue, 371-2244.



City of Keizer

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Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 7 a

TO: MAYOR AND CITY COUNCIL

THROUGH: DOTTY TRYK *dottryk*
CITY MANAGER

FROM: JOHN N. MORGAN, AICP
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: HOUSING ISSUES

DISCUSSION:

Housing Workshop Follow-Up

At a special workshop on July 12, 1993, the Council received presentations on a broad variety of housing issues and related programs. The time limit for the meeting was reached before consensus could be gained on what directions the City should be taking.

Councilor Jerry Watson presented to Council on July 14 a memorandum outlining his proposed housing strategy. The memorandum asks Council to concur in the direction of the strategy and direct Staff to analyze each component.

Staff concurs in the direction Councilor Watson presented and will be prepared in September to present an analysis of each component including project details and options, resource needs, and time frames for implementation.

Comprehensive Housing Affordability Strategy (CHAS)

The CHAS process is underway. A community-wide meeting will be held in early September for the project consultant to receive input on housing needs and priorities. This meeting will be open to the public, but certain target groups (realtors, bankers, seniors,

"Pride, Spirit and Volunteerism"

City Council
August 2, 1993

neighborhoods, housing advocates, etc.) will receive specific invitations. Keizer and Salem's Council, Planning Commissions, and other relevant boards and commissions will also be invited.

A workshop with the Keizer City Council will be held after the draft CHAS is completed in mid-October. A public hearing and decision on the final draft is anticipated in early December.

RECOMMENDATION:

It is recommended Council concur in the general direction of Councilor Watson's proposed housing strategy and direct Staff to return to the Council in September with a more detailed report on the proposal.

Memorandum

DATE: 7/14/93
TO: Keizer City Council
FROM: Gerry Watson 
RE: Housing Issues

I would like to suggest a proposed housing strategy as an outgrowth of the housing workshop we held on July 12th. I recommend the Council concur in the direction of this proposed strategy and direct staff to analyze each of these components. A report on what is involved, what the options are, what the resource needs are, and a time frame for implementation should be returned to the Council in September.

DRAFT HOUSING STRATEGY FOR KEIZER

- (1) Adopt CHAS and priorities
 - a) Creates usable Data Base
 - b) helps access funding
- (2) Implement low cost/low staff housing options in the following priority order
 - a) rehabilitate economically viable owner occupied housing w/repayment to city on sale or encumbrance.
 - b) First time home ownership subsidy w/repayment on sale or encumbrance.
 - c) Public facilities such as parks, street and sidewalk improvements.
 - d) Subsidies for development of small multi unit (2-4) in fill complexes in targeted areas - where targets are based on school populations impact and income levels.
- (3) Adopt housing code with multi-unit licensing fee to be self-sustaining. Enforcement limited to enforcement of building codes and state landlord-tenant statutory requirements. Have city take assignment of tenant rights.
- (4) Abandoned and Derelict Building Ordinance with capacity to obtain personal judgment as well as lien on property.

Personally I would see a lien on other property of the person, at least in this county.
- (5) Adopt a Nuisance Abatement Law coupled with provisions to allow landlord to evict tenant upon receipt of a formal warning from the city to insulate landlord from tenant wrongful eviction.



City of Keizer

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CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 8a

TO: MAYOR KOHO AND CITY COUNCIL MEMBERS

THROUGH: DOTTY TRYK *Doty*
CITY MANAGER

FROM: TRACY L. DAVIS *Tracy*
CITY RECORDER

SUBJECT: PURCHASE OF RECORDS MANAGEMENT SYSTEM

BACKGROUND:

In the 1992-93 budget process, funds were dedicated in the state revenue sharing portion of the budget to purchase a records management system for the City. This electronic system would manage the enormous amount of paper documents generated and received by staff plus allow efficient retrieval of these documents in a timely fashion. In November 1992 a committee was formed with representatives from the Police Department, Community Development Department, Administration and Public Works to research this project. A request for information was drafted, published in the Oregonian and distributed to vendors in the northwest. Based upon the responses received to this request the committee viewed several solutions and also visited work areas actually using these types of records management systems.

ISSUE:

The 92-93 Budget includes a budget note requiring Staff to return to Council for final authorization to proceed with this purchase.

Based upon the following specifications the committee requested written proposals from the vendors:

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Identify an electronic records management system or methodology which:

- as a stand-alone device, can be integrated into the City's Novell network; and
- has the capability to index each document into a common data base, but the flexibility to arrange information for a variety of reports; and
- can be accessed by any workstation on the Network, but protected through access classifications (to be determined/configured by the network administrator); and
- has the capability to thoroughly search the index data base using minimum work queuing; and
- has established and proven its integrity and reliability with respect to repair record and customer satisfaction; and
- has the capability of assigning individual retention dates to each document and a "tickler" for disposition, as a part of on-going records management.

Based upon these specifications, proposals were received from the following firms. With each proposal was included a price, as well as extensive documentation on how each firm's product would meet the standards.

Metropolitan Electronics	\$12,270.00
OrCom Systems	\$14,995.00
Oregon Micro Imaging	\$15,000.00
Linco Micro Imaging	\$17,900.00

By far the best value proposed was by Metropolitan Electronics of Keizer. Their product offers the greatest power and flexibility, and their proposal quoted the lowest price. The proposal from Metropolitan Electronics includes the necessary hardware, Filemagic Plus software program, installation, and training. Metropolitan Electronics has also included a 90-day guarantee if the City is not completely satisfied with the software program.

RECOMMENDATION:

The committee recommends adoption of the Resolution approving the purchase a records management system from Metropolitan Electronics for \$12,270.00.

RECORDS MANAGEMENT SYSTEM

Introduction

The Keizer staff is constantly examining ways to improve the value of service provided to the citizens of the community. Value is measured in three ways; cost savings, improved customer service, and efficiency of the staff.

The application of technology to city government functions has proven to be an area where tremendous value, as defined above, can be found. Examples in Keizer include the recent upgrade of the city hall computer network and the electronic codification of city ordinances. In each case, the relatively small initial investment will be repaid many times over in value to the community.

A particular factor the staff has paid attention to is the young age of the City. Since a great amount of the staff time goes to managing information, implementing the most efficient ways to do so while there is a relatively small amount of information to manage can provide the best long term value. For example, the codification of city ordinances now, when there are only approximately 185 ordinances to be included, makes much more sense than doing it 10 years from now when there will be many fold more.

Proposed Records Management System

In looking for places to create value, the staff has targeted the city records. Included in the draft 92-93 budget is a Records Management System. It is budgeted for \$15,000 with the funds coming from State Revenue Sharing.

The Records Management System will be a dedicated work station where all city records are placed on optical disk. Access to those records is then through the work station where the documents can be viewed on a monitor and can be printed out if necessary.

There are two forms of such systems. They both consist of a computer, optical disk drives, high resolution monochrome monitor, page scanner, and laser printer. In one type of system, of which Canon is the leading vendor, the system is integrated into basically one physical unit with the computer fully dedicated to the records management task. Marion County Building Division uses this system.

The second system is based on free-standing components including using a conventional PC for the computer. The Oregon State School Boards Association uses such a system, with Opti-Com being the vendor.

Keizer staff prefers the second system for two reasons: it is cheaper, and it provides the flexibility to use the computer for other tasks.

These systems work by scanning the original paper record and storing it on an optical disk. When each record is stored it is given a title, cross references, and key words. Most originals are then discarded in compliance with State Records Retention regulations. It is anticipated that

storage of newly created records will begin as soon as the system is installed, with storage of existing records done as time allows. The use of volunteers has been targeted for this work.

When a person wants to review a particular record or all records on a given subject, they can be retrieved instantly by using the title, cross reference, or key words. The records can be viewed on the screen or printed out. The print quality rivals the original document. According to the vendors, these copies are generally acceptable as official public records.

Attached to this report are two articles describing these types of systems and analyzing their value.

Analysis of Value

Current Records Management System - The records management system is a conventional filing system, consisting of paper file folders in filing cabinets. These filing cabinets are in several different locations in the office. There is a loose general filing system, but there are many redundancies and inefficiencies in the system.

City Hall generates a great deal of paper records each year. An inventory of this paper, termed in the number of file drawers per year, follows:

Public Works	6
Community Development	5
Administration	4
Finance	4
Personnel	2
Court	<u>1</u>
TOTAL	22

This does not include other files used for permanent records such as original ordinances or traffic citations. Additional file cabinets are purchased annually for many of these records while others are placed in boxes and stored in the city hall's attic.

When retrieving a record, a staff member must find the proper file cabinet and file. This can be a time consuming task especially for more generalized topics. Certain topics, such as planning cases, are numerically indexed when filed so manual retrieval is faster. With the current manual filing system, there are no provisions for cross referencing or key words so there is no guarantee all items on a given topic can be found. Records generally older than two or three years are stored in the attic. Therefore in order to find a record, one must go up and search through stacks of boxes.

Cost Savings - The \$15,000 investment in this records management system will be recaptured quickly. Not only are there hard savings in filing cabinets and files, there is a substantial savings in staff time. While it is hard to estimate an average time for manually retrieving a record, staff concludes that many hours will be saved through greatly improved efficiency. Finding all records on a topic instantly puts the staff person back to productive work as quickly as possible.

A second part of Cost Savings comes from taking a long range view of the city budget. Staff believes it is inevitable that Keizer will have a computerized records management system at some point. It will become the standard for offices recognizing the efficiency of such a system. The highest level of savings can probably be achieved today when there are only nine years of records.

Third, an optical disk based system is substantially cheaper than the alternatives. With the growth of the City, adding clerical positions to manage the files will cost approximately \$25,000 per year. Microfilming, which has been the traditional method of non-paper records management, costs approximately \$20,000 for a "starter" system. This would not include the sophisticated indexing system.

Improved Customer Service - One of the greatest strengths of a municipal staff is the capability to quickly provide good data. Councils, commissions, citizens, and other staff need thorough information in a timely manner so that well considered decisions can be made.

The proposed records management system will allow the staff to access all city records in a fast, thorough, and comprehensive manner. Accurate, complete, and timely information will be readily available.

Efficiency of the Staff - An inordinate amount of time is spent by professional and semi-professional staff adding and retrieving materials from the filing system. These are tasks that should be handled by lower-wage staff or by an electronic system. As the electronic system is substantially less expensive, especially in the long run, it provides the best short and long term value for the City of Keizer.

Conclusion

The proposed optical-disk based records management system is an excellent value for the City of Keizer. It involves applying the efficiency of a high technology system to the operations of City Hall so that costs are saved, staff is more efficient, and the customer is better served. The proposed system provides a better value than other alternatives and is best applied now while the amount of existing records is relatively small.

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City Recorder



City of Keizer

930 Chemawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

CITY COUNCIL MEETING: August 3, 1993

AGENDA ITEM NUMBER: 8b

TO: MAYOR KOHO AND COUNCIL MEMBERS

FROM: DOTTY TRYK *Dotty*
CITY MANAGER

SUBJECT: RESOLUTION REGARDING MEMBERSHIP IN CCIS INSURANCE POOL

BACKGROUND:

The City's agent of record recommended a an insurance package based on service provide and competitive quote. The property insurance portion of the City's insurance coverage is being provided by City County Insurance Services (CCIS). CCIS is a pooled self insurance program sponsored by the League of Oregon Cities and Association of Oregon Counties. This is slightly different than traditional insurance companies in that they require membership for three years to be approved. Members are all municipalities, they pool their risks and self insure up to a limit of \$50,000 which is then insured. The Pool has been in business for at least 10 years and has established good reserves.

FISCAL IMPACT:

Membership in the pool for property insurance results in a savings of \$1655 over the higher bid. It also provides up to \$5,000,000 in earthquake and flood coverage.

RECOMMENDATION:

It is recommended that the resolution be adopted.

"Pride, Spirit and Volunteerism"

1 CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

2 Resolution R93-_____

3 RESOLUTION REGARDING MEMBERSHIP CITY/COUNTY INSURANCE

4 SERVICES TRUST PROPERTY SELF-INSURANCE POOL

5 FOR THE CITY OF KEIZER, OREGON

6 WHEREAS, the City/County Insurance Services Trust (CIS) offers pooled self-insurance
7 offering cost stability and the potential for long-term savings and;

8 WHEREAS, CIS is sponsored by the League of Oregon Cities and the Association of
9 Oregon Counties as a service to Oregon cities and counties; and

10 WHEREAS, the City of Keizer finds that membership in CIS is of benefit in managing the
11 risks involved in providing services to its citizens; and

12 WHEREAS, the City of Keizer has been provided an opportunity to review the Trust
13 Agreement, Bylaws and Rules of CIS; and

14 WHEREAS, the City of Keizer has reviewed the Trust Agreement, Bylaws and Rules of CIS
15 for compliance with the Charter and Ordinances of the City of Keizer;

16 NOW, THEREFORE, the City of Keizer does hereby enter into a contract with CIS and
17 becomes a member of the CIS Trust for Property for a three-year period commencing July 1, 1993
18 and agrees to abide by the terms of the Trust Agreement, Bylaws and Rules of CIS which, along
19 with this Resolution, constitutes the contract between the City of Keizer and CIS. The City
20 Manager is hereby authorized to execute such documents as are necessary pursuant to this
21 Resolution.

22 PASSED this ____ day of _____, 1993

23 SIGNED this ____ day of _____, 1993.

24 _____
25 Mayor

26 _____
27 City Recorder
28



City of Keizer

930 Chemawa Rd. N.E. • P.O. Box 21000
Keizer, Oregon 97307-1000 • (503) 390-3700 • Fax # 393-9437

CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 8c

TO: MAYOR KOHO AND CITY COUNCIL MEMBERS

FROM: DOTTY TRYK *Dotty*
CITY MANAGER

SUBJECT: UNIMPROVED STREETS

Discussion:

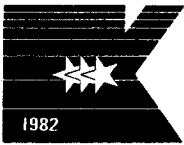
At the July 19, 1993 City Council Meeting, Councilor McGee moved to improve Orchard, Sieberg and both portions of Fillmore Street with a combination of street fund money and the formation of a Local Improvement District. Mayor Koho seconded this Motion.

After a discussion, Councilor McGee moved to table the Motion until the August 2, 1993 City Council Meeting. Councilor Patterson seconded this Motion with unanimous approval by the Council.

Recommendation:

In his July 23, 1993 memo to the Council, the Public Works Director recommended the Council move to amend this Motion by altering the date of continuance from August 2, 1993 to August 16, 1993.

"Pride, Spirit and Volunteerism" _____



City of Keizer

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CITY COUNCIL MEETING: August 2, 1993

AGENDA ITEM NUMBER: 8d

TO: MAYOR AND CITY COUNCIL

THROUGH: DOTTY TRYK *Dottry*
CITY MANAGER

FROM: JOHN N. MORGAN, AICP
COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: RECEIPT OF WILLOW LAKE TREATMENT PLANT NOISE AND ODOR
STUDY

DISCUSSION:

The study of noise and odor around the Willow Lake Treatment Plant has been completed.

The Keizer, Salem, and Marion County Planning Directors have met and developed the following strategy for reviewing the study and developing the implementing programs:

August 2	Study received by Keizer and Salem City Councils
Mid-September	Joint workshop meeting of the Keizer and Salem City Councils and Planning Commissions, and the Marion County Board of Commissioners and Planning Commissions to hear a presentation by the project consultant and to set direction for developing implementing strategies. The issue is referred to the Mid-Valley Planning Forum for detailed review and development of recommendations. The Mid-Valley Planning Forum is the combined Planning Commissions of the Urban Area jurisdictions.

"Pride, Spirit and Volunteerism"

Early-October	The Mid-Valley Planning Forum starts meeting on the issue.
Late-November	The Mid-Valley Planning Forum finalizes its recommendations.
December-January	Recommendations before the decision-making bodies for hearing and decision.

RECOMMENDATION:

It is recommended Council receive the Noise and Odor Study for consideration.

MINUTES

KEIZER CITY COUNCIL

Monday, July 19, 1993

Robert L. Simon Council Chambers
Keizer City Hall

CALL TO ORDER

Mayor Koho called the regular meeting to order at 7:30 p.m.
Roll call was taken as follows:

Present

Dennis Koho, Mayor
Jim Keller, Councilor
Jerry McGee, Councilor
Al Miller, Councilor
Chet Patterson, Councilor
Jerry Watson, Councilor
Marlene Wellin, Councilor

Staff

Dotty Tryk, City Manager
John Morgan, Community Development Director
Wally Mull, Director of Public Works
Charles Stull, Chief of Police
John Lien, City Attorney
Tracy L. Davis, City Recorder

PUBLIC TESTIMONY

Gary Thompson, 5412 Newberg Drive, Keizer voiced his concern for lack of notification the residents in his area received regarding the new access street to McNary High School. Mr. Parson also cited increased bus traffic as a safety concern for his children. He also stated by constructing the new access to McNary, he will loose accessibility to his back yard. Mr. Thompson stated this single solution will not solve the traffic problems. He asked the Council to wait to close Sandy and MacArthur until additional access points are established.

Mayor Koho apologized for the lack of notification. Councilor

Watson also thanked Mr. Thompson for his input and would like to share a copy of the traffic report with him.

Bruce Dover, 5432 Newberg Drive, Keizer also relayed his concerns for the new access road to McNary High School. By removing his accessibility to his backyard, his property value will be reduced. He would like to work with the City and the School District to allow him to retain access to his backyard. He also asked the City to allow all access streets to the High School to remain open so traffic is distributed evenly among the neighborhoods.

Roy Morgan, 5452 Newberg Drive, Keizer also was concerned with the proposed access road. He inquired if the new access road to Lockhaven would line up with the proposed Staats Lake development.

Mr. Morgan also voiced his concern for the posting of commercial signs/posters on the utility poles and other public areas.

Shirley Olson, 4498 Harcourt, Keizer wanted to bring to the Council's attention the need for a four-way stop at Lawless and Greenwood. Previously the traffic engineer had studied this intersection and said the signs were not warranted. She stated people use this as a speedway to avoid all the stops along River Road.

Mayor Koho asked staff to research this matter and report back to Council.

Marion Drake, Cummings Lane, Keizer stated in response to Mr. Morgan's concern for the posting of signs/posters on public property, if community bulletin boards were installed along River Road this would alleviate the problem.

There was no other testimony to come before the Council.

COMMITTEE REPORTS

Mission Statement Report

Councilor Patterson distributed a copy of the report from the subcommittee charged to review the City mission statement. He presented the history of the Mission statement since the City's incorporation in 1982, stating only one change had been initiated during this period. There have been many discussions of what the definition of "basic" services are.

Councilor Patterson moved to alter the mission statement by deleting the word "basic" from the Mission statement.
Councilor Keller seconded the Motion.

In response to a question from Councilor McGee, Councilor Patterson stated "basic city services" has not been as much a guiding force but a philosophy surrounding the rest of the Mission statement. He stated Keizer has moved beyond basic city services.

Councilor Keller stated by removing the word "basic", the statement will clearly and accurately define what the City is doing. Councilor Watson, concurring with Councilor Keller's statement, stated there is not a clear definition of "basic city services."

Councilor Miller reminded the Council this is only a Mission statement and is intended only as a guide. The definition is conceptual in nature only. He recommended leaving the word in since this was the original intent when the voters incorporated the City in 1982.

The Motion passed with the following vote:

AYES: Keller, Koho, Patterson, Watson and Wellin (5)

NAYS: McGee and Miller (2)

ABSTENTIONS: None (0)

ABSENT: None (0)

DISCUSSION

Unimproved Streets

Wally Mull, Public Works Director reviewed the staff report with the Council. Mr. Mull stated that upon incorporation of the City in 1982, a policy was adopted to not maintain the streets that were not up to City standards at that time. This

policy has been maintained to this date. Upon direction from Council, Mr. Mull has reviewed the unimproved streets within Keizer and prioritized these streets for improvements. He outlined several options for the Council to consider; to grade and gravel each road, form a Local Improvement District (LID), pay for improvements from the street fund (gas taxes), combination of LID and street fund money, developer contributions, urban renewal funds or the City could simply do nothing.

Mr. Mull discussed the following advantages and disadvantages of each of the options. He stated grading and graveling will eliminate the potholes and level the road but continued maintenance will be costly in the long run. If an LID was formed, the property owners would have a period of time to pay for these improvements to the streets. Disadvantages listed for an LID include administration costs and possible remonstrances of 2/3 of the property owners. Funding of these projects with street funds would allow the projects to be grouped together for bid purposes and to be done in a time frame that suits the City. If Urban Renewal Funds are used it would allow the street funds to be used for other necessary projects. If the City does nothing, the problem will continue to grow with increased complaints from citizens.

Mr. Mull showed slides that displayed the condition of each listed streets. Mr. Mull prioritized the streets with Orchard Street, Sieberg Street and both portions of Fillmore Street topping the list.

Councilor Watson stated his major concern are the fiscal impact to the City and the fairness to the residents. He discussed options allowing the City to initiate a Local Improvement District without the consent of the property owners. Councilor Watson stated we should invest in these streets as we have in other streets within the City.

Councilor McGee moved to make improvements to Orchard, Sieberg and both portions of Fillmore Street with a combination of street fund money and the formation of a Local Improvement District. Mayor Koho seconded the Motion.

Councilor McGee stated it is fundamentally wrong for the City to pay for the total improvements to these streets. He said the City should contribute at least the minimum of what it would cost to grade and gravel these streets. It is not fair for all the citizens of Keizer to pay for the total improvements to these streets.

Councilor Miller said the City should consider improving all the streets listed in the staff report rather than only these three. They should be given a choice to form a LID to pave the streets or accept the City's offer to improve by grading and graveling.

Councilor Watson voiced his concern the overall cost of grading and graveling the streets in the future will exceed the initial costs of paving. He asked staff to research the possibility of requiring the property owners to contribute to the costs of the improvements.

Mayor Koho suggested the prioritized list be divided to include Orchard, Sieberg and both portions of Fillmore this year, Ring Street and 15th Avenue for next year and Cade and Rowan for the year after that. The City can investigate possibilities of forming LID's in each of these areas with the City contributing 50% of the costs.

Councilor Miller suggested this matter be continued to the next meeting and direct staff to gather further information. Councilor Patterson agreed with this continuation since work will not be started until Spring 1994.

Councilor McGee moved to table the Motion until the August 2, 1993 meeting. Councilor Patterson seconded the Motion.

The Motion passed unanimously as follows:

AYES: Keller, Koho, McGee, Miller, Patterson, Watson and Wellin (7)

NAYS: None (0)

ABSTENTIONS: None

ABSENT: None

Noise Ordinance Report

Chief of Police, Charles Stull reported a Noise Ordinance was first discussed by the City Council in 1986. The results of these discussions resulted in tabling the matter and enforcing the violations under the state statutes. Then in 1990 the matter was again brought to Council and was finalized with the adoption of the existing general Ordinance. Chief Stull stated the general nature of the Ordinance has worked well over the years by allowing the Police Department the discretion of issuing a citation. He stated out of the 939 complaints received since 1990, only 16 have resulted in citations for violation of the noise ordinance.

In conclusion, Chief Stull recommended the Council develop a comprehensive noise ordinance which would address special events.

Councilor Keller thanked the Chief for his work on this matter although he recommended the City amend the current ordinance to allow exemptions or variances for special events. He stated these exemptions could be listed individually in the Ordinance and add language to incorporate new events.

Councilor Watson voiced his concern what events would be allowed and which ones would not. He suggested a permit process. Councilor Miller concurred with Councilor Watson but hoped it would contain exemptions for school athletic events and Keizer Little League events. He also suggested these events should benefit the whole community.

Councilor McGee inquired how animal noise/barking dogs are handled under the current ordinance.

Erik Larson, Municipal Court Judge, advised the Council the general nature of the Ordinance allows the Police Department the discretion to cite or not to cite in each instance. He stated the Court takes all noise cases seriously and the barking dog violations are viewed the same as a loud stereo. Judge Larson commented since the Court portrays an informal setting, he does encourage neighbors to work out their differences to resolve the barking dog or noise problems.

Councilor Miller stated, according to the staff report 98% of all disturbances have been adequately handled without issuance of a citation. He supported Mayor Koho's creation of a subcommittee to study this issue.

Mayor Koho appointed Councilor Keller to chair a subcommittee to review the Noise Ordinance. Councilor Keller shall choose two additional Councilors to serve on this committee.

Sergeant Mark Miranda gave a brief demonstration of how a decibel meter works. The City of Salem uses this instrument to measure noise levels for violations of their city ordinance.

Marion Drake, Cummings Lane, Keizer addressed the Council and asked that the Noise Ordinance be taken seriously. She hoped the Council would consider the packet of information she gathered from Arthur Nixon, Acoustical Engineer from Eugene.

CONSENT CALENDAR

The Consent Calendar consisted of the following:

- a. RESOLUTION - McNary Traffic Solution
- b. Approval of July 6, 1993 Regular Session Minutes

Councilor Keller asked to remove item "a" and from the consent calendar. Councilor Miller asked to remove item "b" from the consent calendar.

Item a

Councilor Keller moved to amend the resolution modifying the access points to McNary High School by excluding lines 23-26. Mayor Koho seconded the Motion.

Councilor Keller expressed his concern these lines would bind the City in future decisions for Claggett Street. Councilor Miller disagreed by stating this information would form a record for future possibilities.

Councilor Watson stated information provided during public testimony listed additional concerns for the City.

The Motion passed with the following votes:

AYES: Keller, Koho, Patterson and Wellin (4)

NAYS: McGee, Miller and Watson (3)

ABSTENTIONS: None (0)

ABSENT: None (0)

City Manager Tryk updated the Council on the progress the City and School District are making towards conclusion of the access road. She stated this matter will come back to Council for authorization of the bid award.

Item b

Mayor Koho moved for approval of the July 6, 1993 Regular Session Minutes. Councilor Watson seconded the Motion.

The Motion passed with the following votes:

AYES: Keller, Koho, McGee, Patterson, Watson and Wellin (6)

NAYS: None (0)

ABSTENTIONS: Miller (1)

ABSENT: None (0)

**WRITTEN
COMMUNICATION**

There was no written communication to come before the Council.

OTHER BUSINESS

Councilor Miller asked the status of the Marion County Building and Planning Agreement and the Marion County Street Maintenance Agreement. City Manager Tryk advised these matters should be back to the Council by August 16, 1993.

Councilor Watson distributed a memo regarding the Housing Issues. Councilor Keller asked for additional time to review this memo and hold discussion at the August 2, 1993 Council Meeting.

AGENDA INPUT

Mayor Koho scheduled a Audit Committee meeting for Monday, August 2, 1993 at 6:30 p.m.

Mayor Koho also scheduled an organizational meeting for the Budget Committee on Monday August 23, 1993 at 7:00 p.m.

Mayor Koho also scheduled a worksession for the Council on Monday, August 30 at 7:00 p.m.

ADJOURNMENT

The meeting was adjourned at 10:07 p.m.

TRACY L. DAVIS
City Recorder

APPROVED:

MAYOR:

CITY OF KEIZER MISSION STATEMENT
**KEEP CITY GOVERNMENT COSTS AND SERVICES TO A MINIMUM BY
PROVIDING CITY SERVICES TO THE COMMUNITY IN A
COORDINATED, EFFICIENT AND LEAST COST FASHION**

SUPPLEMENTAL AGENDA

KEIZER CITY COUNCIL

Monday, August 2, 1993

7:30 p.m.

Robert L. Simon Council Chambers

Keizer City Hall

Keizer, Oregon 97303

7. DISCUSSION

- b. Receipt of the OCA Initiative Petition**

BALLOT TITLE

CAPTION: **CITY CHARTER AMENDMENT TO PROHIBIT MINORITY STATUS FOR HOMOSEXUALITY**

QUESTION: Shall Charter prohibit City adopting or enforcing laws extending minority status based on homosexuality, or expending funds to promote homosexuality?

SUMMARY: Amends City Charter. Prohibits City from adopting or extending minority status or other like benefit based on homosexuality and from establishing any categorical provision which includes homosexuality. Prohibits City from making expenditures to promote or approve homosexuality. States legislative intent that amendment shall not limit library materials for adults; infringe upon civil or constitutional rights; deny any City service, license or approval on basis of private lawful sexual practices; or prevent enactment of City ordinances which prohibit employment decisions based on private lawful sexual behavior.

CITY OF KEIZER
OFFICE 97303

RECEIVED
93 APR 30 PM 3 17

PETITION FOR LOCAL ☒ INITIATIVE ☐ REFERENDUM MEASURE
SIGNATURE SHEET

PETITION I.D. _____

THIS IS A COUNTY/
CITY/DISTRICT
PETITION. SIGNERS OF
THIS PAGE MUST BE
REGISTERED VOTERS IN

TO THE COUNTY CLERK/CITY RECORDER (AUDITOR), COUNTY/CITY/DISTRICT OF KEIZER

We, the undersigned voters, request the attached measure be submitted to the residents of the county/city/district for their approval or rejection. We have not previously signed a petition sheet for this measure.

(Insert caption of ballot title OR number of ordinance/resolution and date adopted) CITY CHARTER AMENDMENT TO PROHIBIT MINORITY STATUS FOR HOMOSEXUALITY

SIGNATURE	DAYS BEFORE ELECTION	PRINT NAME	RESIDENCE ADDRESS STREET AND NUMBER	CITY OR PORT OFFICE	ZIP CODE	PRIORITY OF SIGNING
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						

CIRCULATOR'S VERIFICATION



THIS VERIFICATION MUST BE
SIGNED BY THE CIRCULATOR.

SHEET NUMBER _____

LOCAL INITIATIVE/REFERENDUM MEASURE PETITION

I, (print circulator's name) _____, hereby verify every person who signed this
sheet did so in my presence and I believe each person is a qualified voter in the county/city/district (ORS
250.165, 250.265, 255.135).

SIGNATURE OF CIRCULATOR _____

CIRCULATOR'S ADDRESS (street, city and zip code) _____

I hereby certify _____
signatures on this petition are those of registered voters in _____

County/City/District, Oregon. SIGNATURE OF COUNTY CLERK OR DEPUTY _____

DATE CERTIFIED _____

COUNTY ONLY.
MARION

INSTRUCTIONS

For Circulators

- Only registered voters of the county, city, or district may sign a petition.
- All signers on any one signature sheet must be registered voters of the same county.
- It is advisable to use a pen or indelible pencil for signing petitions.
- Do not use ditto marks.
- A petition circulator must be a registered voter of the State, however does not have to be a registered voter of the county, city, or district.
- Only one circulator may collect signatures on any one sheet of a petition.
- It is unlawful for a petition circulator to knowingly make any false statement to any person who signs it or requests information about it.
- It is unlawful to circulate or file a petition knowing it to contain a false signature.

For Signers

- Only registered voters of the county, city or district may sign a petition.
- Sign your full name, as you did when you registered to vote, and fill in the date on which you signed the petition, your residence address and your precinct in the spaces provided.
- A woman should sign her own name, not her husband's or her husband's initials (for example: not "Mrs. John A. Jones" or "Mrs. J. A. Jones").
- Be sure to print your name clearly in the space provided.
- It is unlawful to sign any person's name other than your own. Do not sign another person's name under any circumstances.
- It is advisable to use a pen or indelible pencil for signing petitions.
- Do not use ditto marks.
- It is unlawful to sign a petition more than once.
- It is unlawful for a person to knowingly sign a petition when the person is not qualified to sign it.

MAIL COMPLETED PETITIONS TO:

Stop Minority Status - PAC
P.O. Box 407
Wilsonville, OR 97070

CHIEF PETITIONER:

INITIATIVE PETITION

David Graham
4877 13th Ave NE
Keizer, OR 97303

BALLOT TITLE: CAPTION: CITY CHARTER AMENDMENT TO PROHIBIT MINORITY STATUS FOR HOMOSEXUALITY

QUESTION: Shall Charter prohibit City adopting or enforcing laws extending minority status based on homosexuality, or expending funds to promote homosexuality?

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AN ACT:

Be it enacted by the People of the City of Keizer:

Paragraph 1. The Charter of the City of Keizer is amended by adding a new Section _____ as follows:

Section _____ (a) The City of Keizer, including its Council and elected or appointed officers, shall not make, pass, adopt, or enforce any ordinance, rule, regulation, policy or resolution that extends minority status, affirmative action, quotas, special class status, or any similar concepts, based on homosexuality or which establishes any categorical provision such as "sexual orientation," "sexual preference," or any similar provision which includes homosexuality.

(b) City funds shall not be expended to promote homosexuality or express approval of homosexual behavior.

(c) This Section shall not be construed to deny any Citizen, based on perceived or actual private lawful sexual practices, any City services, licenses, or approvals otherwise due or available.

(d) This Section shall not be construed to limit public libraries from providing materials for adults which address homosexuality.

(e) Subsection (a) of this Section shall not nullify or be construed to nullify any city, state, or federal civil rights protections based on race, religion, color, sex, marital status, familial status, national origin, age or disability. Neither shall Subsection (a) be construed to abrogate, abridge, impede, or otherwise diminish the holding, enjoyment, or exercise of any rights guaranteed to Citizens by the Constitution of the State of Oregon or the Constitution of the United States.

(f) Subsection (a) of this Section shall not be construed to forbid the adoption of provisions prohibiting employment decisions based on factors not directly related to employment. If such a provision is adopted, it is the intent of the People that lawful private sexual behavior, or rumor, perception, or knowledge of a person's lawful private sexual behavior, are factors not directly related to employment. If such a provision is adopted, it is the intent of the People that personal expression, conversation or any other free expression concerning private lawful sexual behavior shall also be considered factors not directly related to employment, unless such actions disrupt the workplace.

(g) This Section shall be an explicit and necessary restriction and limitation upon the authority of the Council.

(h) It shall be considered that it is the intent of the People in enacting this Section that if any part thereof is held unconstitutional by a court of competent jurisdiction, the remaining parts shall be held in full force and effect. This Section shall be in all parts self-executing.

rcd
8-2-93
C10:58am

July 26, 1993

Keizer Community Development Department
Skip Wendolowski, City Planner
930 Chemawa Road N.E.
Keizer, Oregon 97303

Dear Keizer City Council:

I am writing to make known my concerns and opposition to the installation of lights at the Keizer Little League Fields. My opposition is based on the following reasons:

1. We have inquired several times about lights being placed in the Little League Fields, and have been assured there were no such plans. Based on that information we purchased our home here. How will this affect property values adjoining the fields? Have real estate appraisers been consulted and a disposition available regarding property values?
2. As recent as the spring of 1993 we receive assurance from Kevin at the Keizer City Parks office that there were no plans to add lights to the fields. Why is there now a change in the plans? What benefits do these lights bring for the City of Keizer?
3. By the time it gets dark and the children get home it is pushing curfew time. Is there a need to extend playing time past dark? Is there a curfew time in Keizer? Would the addition of lights be enabling the violation of the city's curfew law?
4. Recently the citizens of Keizer were asked to vote on a tax change due to the city not being able to continue existing services without increased funding. Police, fire, administration and other services we were told will be reduced. Are there projects that will benefit the citizens of the City of Keizer far more than these lights: Police, fire, schools, street lights, sidewalks, bike paths, etc.? Given a choice I would advocate for police, fire and then schools in that order if public funds are being used.

5. In the past I have lived in a city where the school wanted to put lights on the tennis courts. The city assured the residents in the adjoining neighborhood that there would be no use of the courts and lights after 10:00 p.m. After the lights were installed there were no official tennis meets held after 10:00 p.m., but the lights were on for individual use any time of the night. Residents complained, but there was no way to stop the bright lights that illuminated their yard. In addition to the tennis, this area of town became a hang out for children, teens and other. Noise, vandalism, cars tearing up and down the street became a nuisance not only for the residents but also for the police who tried to curtail these activities. Has the city and Keizer Little League thought through the possible problems that may be associated with the addition of these lights? How does the city and park officials intend to limit the use of the lights? How will this be enforced? What recourse is there for residents if policies are violated?

6. At times work crews are busy after dark and sometimes utilize the headlights of equipment to continue working after dark. Will the lights increase the hours that maintenance will be done on the park? If so, what about the noise level for these projects to the residents near the park?

7. This year I have observed quite a number of campers and recreation vehicles parked on the Little League Fields. These campers sometimes are there related to tournaments it seems, but others are apparent the homes for transients. Will lights increase this problem? If police have not stopped this problem, if the presence of lights increases the problem how will it be dealt with?

8. Next is the problem of vandalism at the Little League Fields. The park has a lot of vandalism, drinking, and other activities taking place there during the night. This is especially true during the fall and winter months. Trash, alcoholic bottles, used condoms and other items are found littering the grounds. Increased hours of park use and lighting may not help alleviate this problem, but may add to the problem. How will this be handled by the city and the Little League?

9. Lighting does not seem to be the biggest need for the park. Parking is terrible. Ridge Drive has cars all up and down it. This poses a congestion problem as well as a safety problem with children and adults crossing traffic. Has priority been considered to look at ways of increasing parking, buying additional land for parking or buying property elsewhere in Keizer to expand the Little League?

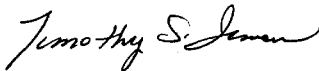
Having property adjoining the Little League Fields, I do not see how the addition of lights will improve my quality of living. In addition, dealing with the added noise and other associated problems mentioned above, having the yard illuminated at night and other factors I believe will adversely affect the resale value of my property.

For these reasons and others I may not be aware of I find myself to be in strong opposition to the installation of said lights. I realize that there are not very many homes that will be affected in the same way that I will. Therefore, I ask that this letter be considered very strongly.

I am very pleased and proud of the great job that Keizer has done in providing this opportunity for the youth of the community. It is a very positive outlet for the children. I support the continued operation of this program.

Thank you for your willingness to address these concerns. I look forward to hearing how the Keizer Little League and Keizer Parks Department may address these issues. Hopefully there will be clear forethought and planning to avoid problems in the future that the City does not now face.

Sincerely,



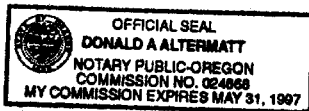
Timothy S. Irmen, resident

State of Oregon
County of Marion

Signed or attested to me on July 30, 1993 by Timothy Irmen

Donald a. Altermatt

My Commission expires: MAY 31, 1997



KEICKER LITTLE LEAGUE PARK
CAUDDTOWN VASE (LIGHTS)

DATE: 8-2-93

PLACE: COUNCIL CHAMBERS

TIME: **7:30 PM**

[illegible]

BEFORE: City Council

PLACE: Council Chambers

TIME: **7:30 PM**

[illegible]

8293

Vital Council

Council Chamber

7:30 PM

[illegible]

MAY CULT STREET LIGHT DIST.

8-2-93

PLACE: Council Chambers

7:30 pm

[illegible]

PUBLIC HEARING REGARDING: THE MEADOWS PHASE 6 STREET LIGHTS DATE: 8-2-93
BEFORE: City Council PLACE: Council Chambers TIME: 7:30 pm

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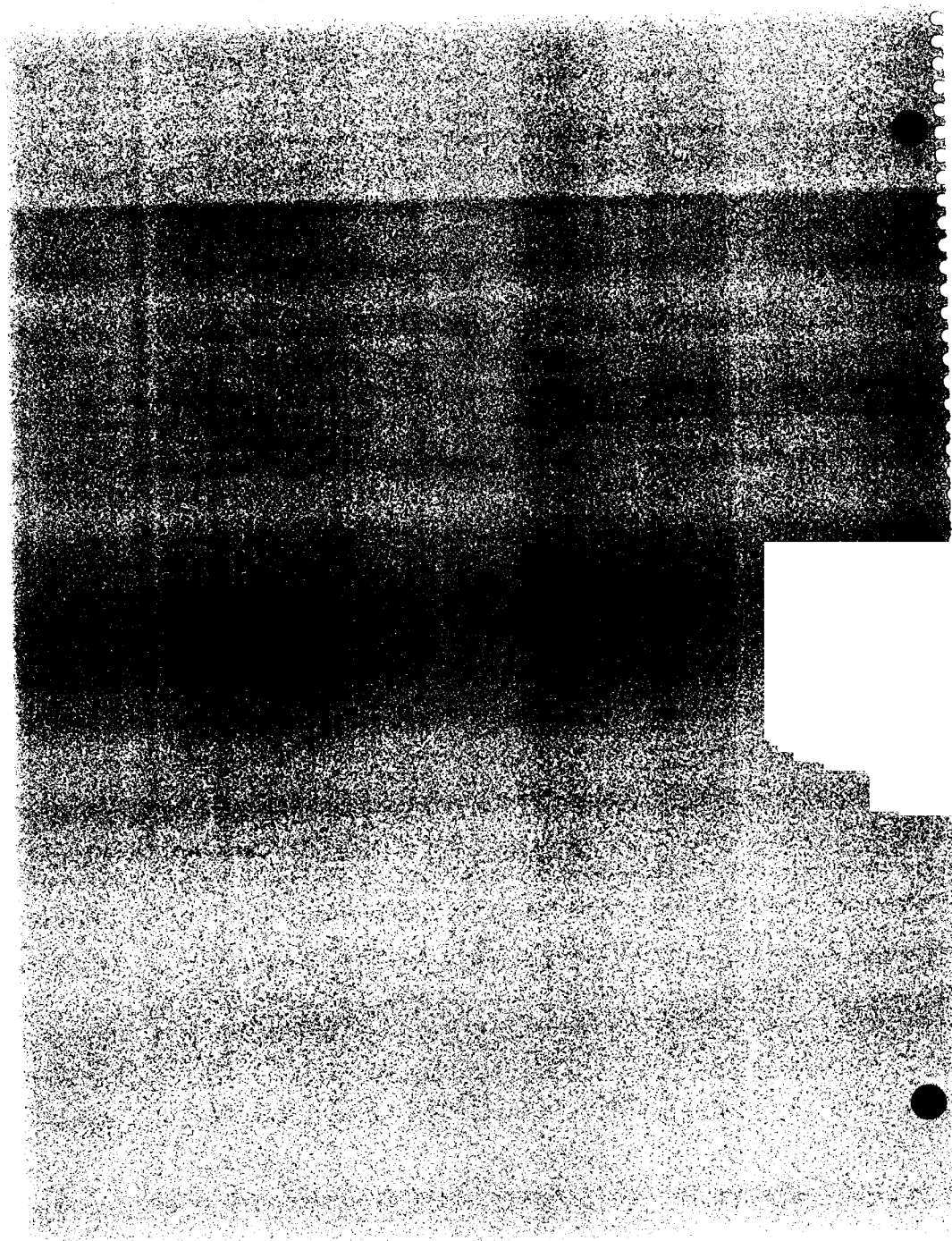
PUBLIC HEARING REGARDING: THE MEADOWS PHASE 6 STREET LIGHTS DATE: 8-2-93
BEFORE: City Council PLACE: Council Chambers TIME: 7:30 pm

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PUBLIC HEARING REGARDING: THE MEADOWS PHASE 6 STREET LIGHTS DATE: 8-2-93
BEFORE: City Council PLACE: Council Chambers TIME: 7:30 pm

Section 6
Alternative Comparisons



Section 6 Alternative Comparisons

Introduction

This section develops capital and annual operation and maintenance (O&M) costs for the three alternatives described in Section 5. The costs for these alternatives are compared using equivalent present worth. Conclusions are then drawn considering the economic comparison, the need for additional study, and from information presented in earlier sections. The reader is referred to Section 5 for a detailed description of each alternative.

Assumptions

The following assumptions have been made in developing capital costs, O&M cost estimates, and alternative present worth:

- Building addition costs of \$75 per square foot
- U.S. 20-city average ENR construction cost index of 5,483
- Correction to Salem, Oregon, of 97.1 percent from the U.S. 20-city average
- Labor cost of \$22 per hour
- Interest rate of 7 percent
- Project life of 15 years
- Power cost of 3.9 cents per kilowatt hour
- Annual equipment maintenance costs of 5 percent per year of equipment capital cost
- Chemical cost for odor scrubbing incurred only during canning season
- Labor, maintenance, and power costs incurred for entire year

Chemical costs for implementation of the alternatives are listed in Table 6-1.

Table 6-1 Chemical Costs			
Chemical	Unit	Cost	Notes
Caustic	gal	\$0.565	50%
Chlorine	ton	\$262	Bulk delivery
Sodium hypochlorite	pound	\$0.50	

Allowances for noncomponent construction costs were developed based on actual construction cost data from similar projects. Because of the preliminary nature of this analysis, cost opinions are considered "order of magnitude" as defined by the American Association of Cost Engineers and the American National Standards Institute. Accuracy for this level of cost opinion is within minus 30 to plus 50 percent. It is our opinion that these costs are not suitable for budgeting purposes.

The nature of these cost estimates are very general. The more complicated alternatives will require substantially more development to identify the unforeseen costs involved in retrofitting existing structures and equipment with odor control devices. The costs provide a good overall basis for comparison and show the relative impacts of various levels for odor mitigation. Prior to implementing capital alternatives for odor control at Willow Lake WWTP, planning efforts should be conducted to determine the best and most economical methods for odor control that will meet both the community's current and future needs.

Alternative 1-Plant Encapsulation

Capital and annual O&M costs for Alternative 1 are shown in Tables 6-2 and 6-3. The costs for this alternative are presented on the basis of providing complete encapsulation for odor sources identified in previous sections. If this alternative is implemented, significantly more development should be performed to refine the actual cover and scrubber philosophy and evaluate other innovative methods to reduce construction costs.

Table 6-2
Alternative 1-Plant Encapsulation Capital Costs

Equipment Costs	Action	Air Flow	Structures	Scrubbers	Total
Bar Screen	Enclose & Scrub	\$ 12,000	\$ 51,600	\$ 166,500	\$ 218,100
Headworks	Enclose & Scrub	15,000	67,850	205,000	272,850
Primary Clarifiers	Enclose & Scrub	62,400	1,870,000	442,000	2,312,000
Trickling Filters	Enclose & Scrub	320,000	5,567,000	1,800,000	7,367,000
Sludge Lagoons	Thickeners & Tanks	10,000	3,121,000	100,000	3,221,000
Gravity Thickeners	Enclose & Scrub	1,420	237,000	90,000	327,000
Channels	Enclose	0	100,000	0	100,000
		\$420,820	\$11,014,450	\$2,803,500	\$13,817,950
Noncomponent Costs				Allowance	Cost
Ductwork				16%	\$2,210,872
Mechanical				7%	967,257
Electrical				8%	1,105,436
Instrumentation				8%	1,105,436
Site/Civil				3%	414,539
Mobilization				12%	1,658,154
Subtotal					7,461,693
Contingency				30%	\$6,383,893
Nonconstruction Costs					
Engineering Design				8%	\$ 2,213,083
Services During Construction				8%	2,213,083
City Legal & Administration				5%	1,383,177
					5,809,343
Total Capital Cost					\$33,472,878

Table 6-3
Alternative 1-Plant Encapsulation Annual O&M Costs

Unit Process	Labor	Power	Chemicals	Maintenance	Total
Bar Screen	\$ 2,086	\$ 1,000	\$ 8,200	\$ 5,040	\$ 16,326
Headworks	2,609	1,600	10,400	6,150	20,759
Primary Clarifiers	22,111	6,300	41,700	13,260	83,371
Trickling Filters	70,455	44,850	22,800	52,800	190,905
Sludge Lagoons	30,805	4,000	70,000	46,800	151,605
Gravity Thickeners	3,127	150	1,200	2,700	7,177
Channels	956	0	0	300	1,256
Totals	\$132,150	\$57,900	\$154,300	\$127,050	\$471,400

Alternative 2—Priority Source Control

Capital and annual O&M costs for Alternative 2 are shown in Tables 6-4 and 6-5. The actual costs for this alternative are presented on the basis of providing odor control only for the largest emission sources as discussed in Section 5. If this alternative is implemented, significantly more development should be performed to refine the actual cover and scrubber philosophy and evaluate other innovative methods to reduce construction costs.

Table 6-4 Alternative 2—Priority Source Control Capital Costs					
Equipment Costs	Action	Air Flow	Structures	Scrubbers	Total
Chlorine Addition	Piping & Misc.	\$ 0	\$ 25,000	\$ 0	\$ 25,000
Bar Screen	Enclose & Scrub	12,000	51,600	166,500	218,100
Headworks	Enclose & Scrub	15,000	67,850	205,000	272,850
Primary Clarifiers	Enclose & Scrub Launders	4,900	265,000	121,000	386,000
Trickling Filters	Force Ventilate & Scrub	67,000	335,000	455,000	790,000
Sludge Lagoons	Change Operation	0	0	0	0
Gravity Thickeners	Enclose & Scrub	0	0	0	0
Channels	Enclose	0	100,000	0	100,000
		\$98,900	\$844,450	\$947,500	\$1,791,950
Noncomponent Costs				Allowance	Cost
Ductwork				16%	\$ 286,712
Mechanical				7%	125,437
Electrical				8%	143,356
Instrumentation				8%	143,356
Site/Civil				3%	53,759
Mobilization				12%	215,034
Subtotal					967,653
Contingency				30%	827,881
Nonconstruction Costs					
Engineering Design				8%	286,999
Services During Construction				8%	286,999
City Legal & Administration				5%	179,374
					753,372
Total Capital Cost					\$4,340,856

Table 6-5 Alternative 2-Priority Source Control O&M Costs					
Unit Process	Labor	Power	Chemicals	Maintenance	Total
Chlorine Addition	\$ 615	\$ 200	\$39,300	\$ 750	\$ 40,865
Bar Screen	5,361	1,000	8,200	5,040	19,601
Headworks	6,707	1,600	10,400	6,150	24,857
Primary Clarifiers	9,489	390	3,400	3,600	16,879
Trickling Filters	19,420	7,250	4,900	13,700	45,270
Sludge Lagoons	0	0	0	0	0
Gravity Thickeners	0	0	0	0	0
Channels	2,458	0	0	300	2,758
Totals	\$44,050	\$10,440	\$66,200	\$29,540	\$150,230

Alternative 3-Chlorine Addition

Capital and annual O&M costs for Alternative 3 are substantially less than for the two previous alternatives. It is anticipated that improvements to the chlorine delivery system would be on the order of \$25,000 if performed by outside contractors. This may be reduced substantially if the improvements are performed by plant staff. Annual chlorine addition costs are estimated to be approximately \$41,000 per year for chlorine and small allowances in maintenance and power.

Economic Comparison

A present worth comparison for the alternatives is presented in Table 6-6. As can be seen, each alternative represents about one order of magnitude increase in present worth costs. This compares to a corresponding reduction in emission rates of 98 percent for Alternative 1, 59 percent for Alternative 2, and 8 percent for Alternative 3.

Table 6-6 Alternative Present Worth Comparison			
	Alternative 1 Plant Encapsulation	Alternative 2 Priority Source Control	Alternative 3 Chlorine Addition
Emissions Reduction	98%	59%	8%
Capital Cost	\$33,472,878	\$4,340,856	\$25,000
Annual O&M	471,400	150,230	40,865
O&M Present Worth*	4,293,471	1,368,282	372,191
Total Present Worth	\$37,766,349	\$5,709,137	\$397,191
*Assumes 15-year project life, 7 percent interest rate, no replacement costs, and no salvage value.			

Conclusions

The information presented in Sections 2 through 6 has quantified, to the extent possible, odor emissions from the Willow Lake WWTP and their impact on the surrounding community. Noise emissions are discussed in Section 8 (Volume II). Three alternatives to reduce emissions from the plant have been developed, and order of magnitude cost opinions have been developed. Based on this information, the following conclusions can be drawn.

- The odor emissions from the plant impact the surrounding area a significant distance outside the currently defined special interest area during canning season.
- Non-canning season emissions from the plant cause negligible impact on the community.
- Eliminating canning season impacts will require between \$23 and \$50 million on a present worth basis.

Before implementing large-scale capital projects, detailed planning efforts should take place to evaluate the compatibility of future expansion with odor control requirements. This should include identification and quantification of offsite odor sources that impact the community. Additional investigation of economical odor control alternatives should also be conducted.

Section 7
List of References

Section 7

List of References

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- (2) *Final Emissions Inventory Report* for Sacramento Regional County Sanitation District. CH2M HILL. November 1990.
- (3) *Guideline on Air Quality Models*, EPA-450/2-78-027R. USEPA, Research Triangle Park, North Carolina. 1985.
- (4) *Manual of Practice No. 8, Design of Municipal Wastewater Treatment Plants*, Vols. II and III. Water Environment Federation. 1992.
- (5) *Quality Assurance Handbook for Air Pollution Measurement System*, Vol. IV, EPA 600/4-82-060. USEPA. April 1982.
- (6) *Supplement B to the Guideline on Air Quality Models (Revised)*. (Draft). USEPA, Research Triangle Park, North Carolina. 1990.
- (7) *Unified Sewerage Agency Sludge Storage Facility Noise and Odor Emissions Study*. August 1992.
- (8) *User's Guide for the Industrial Source Complex (ISC2) Dispersion Model*, EPA-450/4-92-008a. USEPA, Research Triangle Park, North Carolina. March 1992.
- (9) *Willow Lake WWTP Noise and Odor Control Study-Work Plan*, Vol. I. CH2M HILL. July 1991.
- (10) *Willow Lake WWTP Noise and Odor Control Study-Sampling and Analysis Plan*, Vol. II. CH2M HILL. July 1991.
- (11) *Willow Lake WWTP Noise and Odor Control Study-Quality Assurance Plan*, Vol. III. CH2M HILL. July 1991.
- (12) *Willow Lake WWTP Comprehensive Noise and Odor Study-Planning Document Addenda and Data Report*. CH2M HILL. July 1992.
- (13) *Willow Lake WWTP Comprehensive Noise and Odor Study-Interim Report*. CH2M HILL. January 1992.
- (14) "Odor Threshold Determinations of 53 Odorant Chemicals." *Journal of the Air Pollution Control Association*, Vol. 19, No. 2. February 1969.



**Table 5-4
Alternative 3-Chemical Addition
Emission Rates**

Source	Emission Rates		Percent Reduction (%)
	Canning (g/hr)	w/Controls (g/hr)	
Trickling Filters	436.48	436.48	0
Bar Screen Channel Stack	27.46	20.60	25
Raw Sewage Pump Station	23.73	17.80	25
Headworks			
Grit Storage Truck	0.13	0.13	0
Headworks Effluent Channels	6.19	4.64	25
Screenings Box	0.02	0.02	0
Grit Classifiers	0.00	0.00	0
South Primary Clarifiers			
Surface	17.16	12.87	25
Weirs	43.99	32.99	25
North Primary Clarifiers			
Surface	12.81	9.61	25
Weirs	26.97	20.23	25
Sludge Storage Lagoons	8.76	2.92	67
Gravity Thickeners	0.11	0.11	0
Wet Wells	5.20	3.92	25
Channels	2.90	2.61	10
Miscellaneous	3.08	3.08	0
Total	615.01	568.03	8

description of the odor contour generation process. The 300-ppb contour is exceeded 1 percent of the time approximately 1.2 miles east of the plant. The 100-ppb contour is exceeded 1 percent of the time over 2 miles from the plant toward the east. The 10 percent exceedance contours occurrence or 350 hours (about 14 days total) during canning season occur very near the plant and generally fall within the Dual Interest Area. At 300 ppb, the 10 percent contour is approximately 0.25 miles east of the plant. At 100 ppb, the 10 percent contour is roughly 0.6 miles from the center of the plant. The 300 ppb, 1 percent exceedance contour covers approximately 720 acres or 65 percent of the area covered under baseline conditions.

Alternative 3—Chemical Addition

This alternative represents the least intensive investment of capital for odor control. This alternative is intended to reduce the size of the odor impact footprint to the extent possible using only operating changes and chemical addition.

Description

During the Phase 2 Event 2 sampling episode, three different chemicals were tested to evaluate their effectiveness on odor control (caustic, ferric chloride, and chlorine). This is described in detail in Section 3. Based on the results of this sampling, chlorine addition was selected as the most effective, which is very consistent with existing plant practices. The plant currently has capacity to supply chlorine in excess of the normal chlorine demand. This alternative would provide a larger chlorine solution line than currently is in place, and move the injection point upstream of the bar screen facility. The new line would be equipped with a larger rotameter to allow measurement of solution flow. This alternative also includes limiting operation to one sludge lagoon during the canning season.

Emission Rates and Odor Contours

The emission rate reduction for this alternative is shown in Table 5-4. Based on sampling, no reduction in the trickling filter emissions was expected. While the sampling showed slightly more than 25 percent reduction of odor in processes upstream of the trickling filters, this number represented a conservative value with a small factor of safety for unforeseen loading and meteorological conditions.

The odor contour for this alternative is shown in Figure 5-3. The 300 ppb contours show that this concentration is exceeded approximately 1 mile north and south of the plant 1 percent of the canning season, and a distance of several miles to the east. The 300 ppb, 1 percent contour encompasses approximately 1,860 acres or about 90 percent of the baseline canning season condition.

Option 2b-Transfer Load to HPO System

Another option to reduce the load on the trickling filters would be to route more flow to the HPO activated sludge system. As mentioned above the load on the trickling filters must be reduced to 10 pounds of BOD per 1,000 cubic feet of media to sufficiently reduce H_2S emissions and maintain a completely aerobic filter.

Table 5-2 summarizes both the 1975 design criteria and required process loadings under this operating configuration at the design flow of 35 mgd peak month canning load. As shown in the table, the original HPO system design had approximately 24,000 pounds of BOD treated by the trickling filters. This would need to be reduced to around 12,000 pounds of BOD per day to sufficiently reduce the load on the trickling filters. All the remaining flow would then be treated as required by the south plant. Using the original design criteria of 15 percent BOD removal in the south primary clarifiers, the load to the HPO system is 108,800 or approximately 19 percent over the listed design capacity.

This operating configuration would reduce remaining design life. An option to raise the plant capacity back to its original level would be to add chemical flocculants to the primary clarifiers to improve BOD removal. This was briefly evaluated during the last sampling event using ferric chloride as a coagulant, which did not appreciably increase primary BOD removal but did generate additional secondary solids. This is probably due to the complex nature of the cannery waste treated at the plant. The metal ion chelates with nonflocculating organic species and does not initially produce a floc. As the organic compounds are oxidized in the secondary system, the ferric ion is released and complexes with phosphate and hydroxide to form flocculent particles that settle in the secondary clarifiers. This results in the observed increase in secondary sludge. More evaluation should be done with other flocculants, including alum and polymers, if this option is pursued.

The plant's primary mission is to protect water quality. Under the loadings and process configuration currently run during canning season, the plant produces effluent BODs in the 5 to 7 mg/l range. It is unlikely that the plant will produce as good an effluent under the proposed reduced load configuration. This conflicts with the plant's primary mission. The current configuration also produces benefits in terms of pH control that would need to be compensated for by using chemicals under this option. Because of the reduced capacity of the plant, potential degradation in effluent quality, and the resulting increase in pH control chemicals and oxygen generation requirements, this option does not appear feasible. As with Option 2a, this option may provide benefits if combined with other measures in a scaled back manner.

**Table 5-2
Alternative 2 Option B
Reduced Load on Trickling Filters**

Description	Design	Option 2b
Plant Influent (Peak Month)		
Flow, mgd	35	35
TSS #/day	76,000	76,000
BOD, #/day	142,500	142,500
North Primary Clarifiers		
Flow, mgd	8.5	4.25
TSS #/day	18,457	9,229
BOD, #/day	34,607	17,304
Overflow Rate, gpd/sf	376	188
South Primary Clarifiers		
Flow, mgd	26.5	30.75
TSS #/day	57,543	66,771
BOD, #/day	107,893	125,196
Overflow Rate, gpd/sf	860	999
Trickling Filter Influent		
Flow, mgd	8.5	4.25
TSS #/day	6,460	3,230
BOD, #/day	24,225	12,113
Loading Rate #BOD/1,000 cf	19	10
Trickling Filter Effluent		
Flow, mgd	8.5	4.25
BOD, #/day	4,845	2,423
HPO Influent		
Flow, mgd	35	35
BOD, #/day	91,700	108,839
Loading Rate #BOD/1,000 cf	161	191

Option 2c-Force Ventilate Trickling Filters

The recommended option for reducing odor emissions from the trickling filters involves equipping each filter with forced air ventilation and scrubbers. As described in Section 4, the primary phenomenon responsible for odor generation by the trickling filters is the plume that is released as the air temperature drops below the wastewater temperature. Forced ventilation will reduce the odor emissions in two ways. First, by ensuring adequate air is supplied to the media, the filters will stay more aerobic. This will tend to reduce the amount of H₂S actually generated in the filter. Second, forced ventilation will delay the release of the plume. It would not be economical to provide sufficient ventilation air to prevent the plume from being released under any circumstances. However, increasing the temperature differential at which the release occurs will tend to delay the release until much later in the evening. The combined result of this measure will be to decrease emissions from the trickling filters by approximately 30 to 70 percent depending on the applied loading and meteorological conditions. A reduction of 50 percent is assumed for this analysis.

For the purposes of developing alternative comparison costs, the ventilation system is sized to provide approximately 17,000 scfm of air in a down draft mode for each filter. This value was calculated using the procedures described in the WEF Manual of Practice No. 8 (Reference 4). It is recommended that full-scale tests be run during canning season to verify the actual ventilation rate necessary to reduce odors.

Emission Rates and Odor Contours

The emission rates for Alternative 2 are shown in Table 5-3. Emissions rates for the trickling filters are reduced by 50 percent, while other reductions resulting from chemical additions, covering wet wells and hatches, primary clarifier launder covers, and operational changes result in an overall reduction in emissions of about 59 percent.

Table 5-3 Alternative 2—Priority Source Control Emission Rates			
Source	Emission Rates		Percent Reduction (%)
	Canning (g/hr)	w/Controls (g/hr)	
Trickling Filters	436.48	218.24	50
Bar Screen Channel Stack	27.46	0.27	99
Raw Sewage Pump Station	23.73	0.24	99
Headworks			
Grit Storage Truck	0.13	0.13	0
Headworks Effluent Channels	6.19	0.06	99
Screenings Box	0.02	0.00	99
Grit Classifiers	0.00	0.00	99
South Primary Clarifiers			
Surface	17.16	12.87	25
Weirs	43.99	0.44	99
North Primary Clarifiers			
Surface	12.81	9.61	25
Weirs	26.97	0.27	99
Sludge Storage Lagoons	8.76	2.92	67
Gravity Thickeners	0.11	0.11	0
Wet Wells	5.20	3.92	25
Channels	2.90	2.45	15
Miscellaneous	3.08	3.08	0
Total	615.01	254.63	59

The odor contour generated using these emission rates is shown in Figure 5-2. Contours have been drawn for 100-ppb and 300-ppb concentrations that will be exceeded 0.1, 1, and 10 percent of the time, respectively, during canning season. See Section 4 for a detailed

Section 5 Onsite Odor Mitigation Alternatives

Introduction

The previous sections discuss the characterization and quantification of odor emissions from Willow Lake WWTP during canning and non-canning conditions. Based on the odor contour generated using peak canning season emission rates, it is apparent that there are significant odor impacts both within and beyond the special interest area designated in the dual interest agreement during canning season. Our opinion is that the 300 ppb, 10 percent exceedance contour is incompatible with residential land use. The 300 ppb, 1 percent exceedance contour may be marginally compatible with residential development. Significant capital and operational expense may be incurred depending on the level of odor reduction required.

The approach taken here is to develop odor mitigation strategies for the plant and to quantify the resulting reduction in odor footprint. Three basic alternatives for odor mitigation have been developed:

- Alternative 1—Total Plant Encapsulation
- Alternative 2—Priority Source Control
- Alternative 3—Chemical Addition

These alternatives represent three levels of odor mitigation for the surrounding community with Alternative 1 being the greatest level of mitigation, Alternative 3 being the least. This ranking also represents the level of capital and annual investment the plant would make in implementing some form of the above alternatives. The fourth alternative available is to take no action to mitigate odor impacts from the plant. This option is represented by the baseline contours presented in Section 4 and has no associated cost.

This set of alternatives does not represent all potential options for reducing the odor emissions from Willow Lake WWTP. They provide a representative basis for comparison for various levels of odor mitigation. Prior to implementing the more costly alternatives, significantly more evaluation should be performed to validate all assumptions and identify unknowns.

Alternative 1—Plant Encapsulation

This alternative represents the highest reasonable level of odor mitigation possible at Willow Lake WWTP. It also represents the most costly approach. This alternative is structured to produce zero impact outside the plant boundary. Theoretically, this alternative would allow residential development to occur very near the plant and, if implemented, could provide a basis for changing the zoning restrictions in the special interest area.

Description

This alternative would encapsulate all significant odor sources at the plant with buildings or covers in the most economical fashion possible. While options to change technologies or replace old equipment may be available and more logical from a long-term standpoint, eliminating odor sources makes the alternatives directly comparable. Process air used to ventilate the areas will be treated using chemical odor scrubbers. Specific elements for this alternative include:

- Enclosing the bar screen within a larger enclosed building to contain and scrub odors
- Expanding the headworks/raw sewage pump station building to enclose the grit removal and classification area, grit truck loading area, and pump station effluent channel
- Providing covers for the primary clarifiers
- Providing covers for the trickling filters
- Providing covers for the gravity thickeners and splitter box
- Providing a cover for the mixed liquor splitter box
- Eliminating the sludge storage lagoons and replacing them with a digested sludge thickening facility and approximately 2 million gallons of liquid storage tanks
- Replacing all process channel grated access hatches with solid aluminum hatch covers

Because very little odor is produced by processes downstream of the trickling filters, no mitigation is recommended for these processes. All scrubbers will be sized to provide a minimum of six air changes per hour in infrequently occupied process areas and 15 air changes per hour in occupied areas. Chemical consumption for the scrubbers is based on the H_2S concentrations measured in the field during the sampling events. No allowances have been included to mitigate any visual impact of the covered facilities.

Emission Rates and Odor Contour

The emission rates for Alternative 1 are shown in Table 5-1. As described above, all significant odor sources are covered and scrubbed with an assumed odor reduction of 99 percent. The sludge lagoons have been replaced with a digested sludge thickening facility and tank storage which eliminates this source. The overall reduction in emissions for this alternative is 98 percent.

Table 5-1 Alternative 1-Plant Encapsulation Emission Rates			
Source	Emission Rates		Percent Reduction (%)
	Canning (g/hr)	w/Controls (g/hr)	
Trickling Filters (Average)	436.48	4.36	99
Bar Screen Channel Stack	27.46	0.27	99
Raw Sewage Pump Station	23.73	0.24	99
Headworks			
Grit Storage Truck	0.13	0.00	99
Headworks Effluent Channels	6.19	0.06	99
Screenings Box	0.02	0.00	99
Grit Classifiers	0.00	0.00	99
South Primary Clarifiers			
Surface	17.16	0.17	99
Weirs	43.99	0.44	99
North Primary Clarifiers			
Surface	12.81	0.13	99
Weirs	26.97	0.27	99
Sludge Storage Lagoons	8.76	0.00	100
Gravity Thickeners	0.11	0.00	99
Wet Wells	5.20	0.05	99
Channels	2.90	0.35	88
Miscellaneous	3.08	3.08	0
Total	615.01	9.43	98

The results generated using these emission rates is shown in Figure 5-1. All contours were produced using the same modeling methodology described in Section 4. The contour was calculated for the 100-ppb complaint threshold for H₂S. The 0.1 percent, 100 ppb contour was the only observed exceedance under this alternative. This contour falls either within the Dual Interest Area or on agricultural land indicating that odor complaint-causing concentrations do not occur a significant distance away from the plant.

Alternative 2-Priority Source Control

This alternative represents a less intensive investment of capital for odor control of only the largest sources at the plant. This alternative is intended to significantly reduce the size of the odor impact footprint while minimizing capital outlay for odor control. The focus is to reduce the impact on residences outside the existing special interest area.

Description

Several configurations were screened for this option. Since the trickling filters are the largest odor source, control measures should find the most economical method to reduce these emissions. The intent was to evaluate the most feasible option for priority source control and consider other configurations at a later date if necessary. These options are discussed in detail below. Secondary source control not related to the trickling filters is identical for all options. It includes:

- Enclosing the bar screen identical to Alternative 1
- Covering and scrubbing the launders of all primary clarifiers
- Replacing all process channel grating with solid aluminum hatch covers
- Modifying the operation of the sludge lagoons to allow no more than one lagoon to be full during the canning season
- Adding chlorine to the wastewater ahead of the bar screen

Option 2a-Additional Trickling Filters

The first option was to add additional trickling filters to bring the canning season loading down to 10 pounds of BOD per 1,000 cubic feet of media. At this loading rate, the trickling filters will remain entirely aerobic through natural ventilation and very limited stripping will occur. This alternative includes the addition of 8 more 225-foot-diameter trickling filters, recycle pump stations, and associated flow splitting structures. The plant would continue to operate as a trickling filter/activated sludge system during canning season.

This alternative has several drawbacks. First, the addition of 8 more filters would cost between \$15 and \$30 million. This is nearly as expensive as Alternative 1 (see Section 6) for less effective odor control. Second, the addition of treatment units may be viewed by DEQ as a plant expansion, which would trigger tighter effluent discharge standards than are currently in force. Third, loading the filters at such a low rate will allow them to remove BOD to a very high level. This may make it difficult to supply enough food to the high purity oxygen activated sludge system to keep it alive and vital.

Because of these drawbacks, this option is not considered feasible as an economical method to achieve priority source control. Should the City wish to increase treatment capacity, this may be more viable. A scaled down version of this alternative or addition of roughing filters with plastic media might also be considered in conjunction with other alternatives as discussed next.

Non-Canning Season Impacts

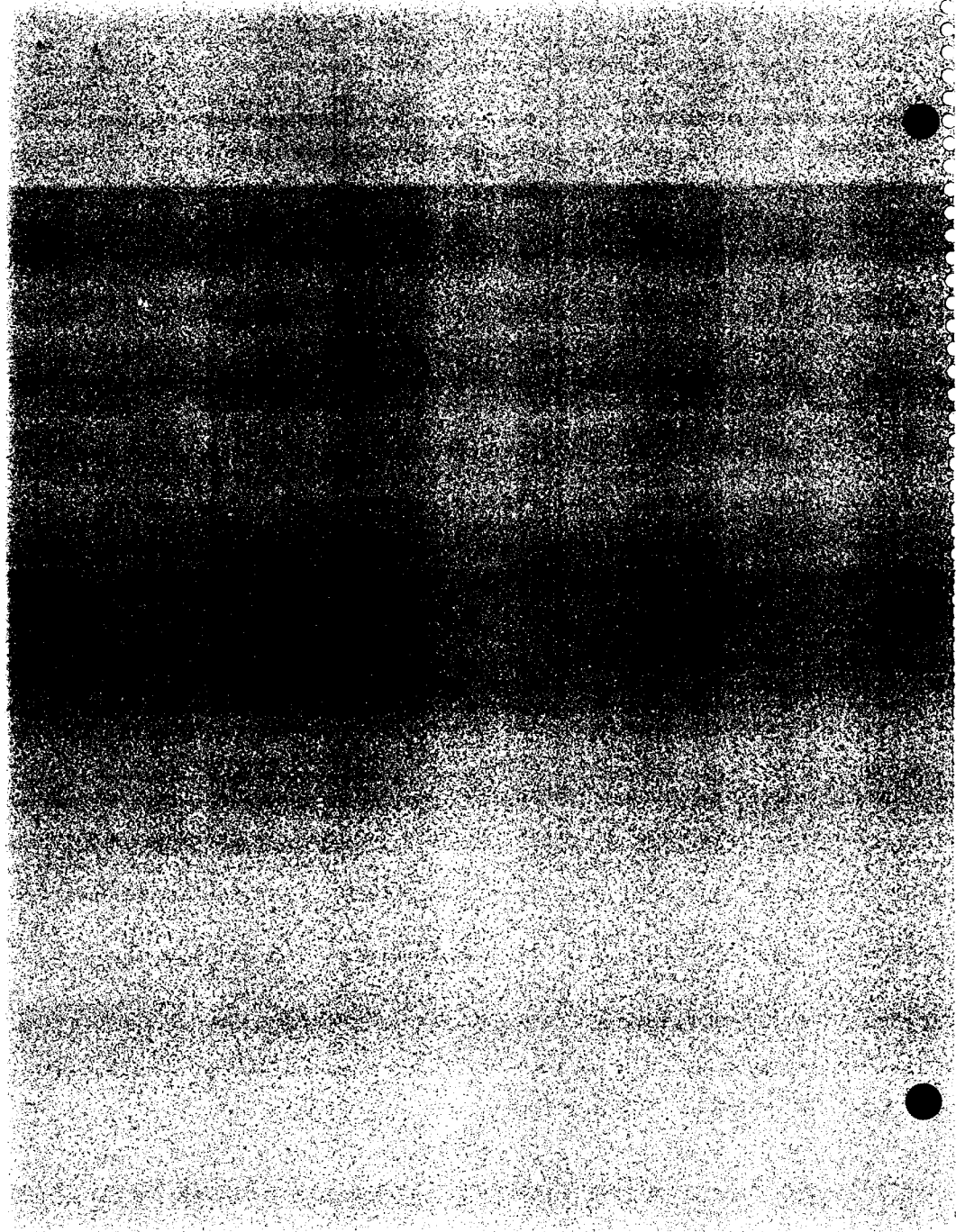
The odor impact footprint for Willow Lake WWTP during non-canning season is shown in Figure 4-4. Impacts from H_2S emissions are negligible at any point beyond the site boundary. Contours were also run for exceedance of 1 and 3 ppb to determine if H_2S exceeded even detectable limits with any regularity. These contours are not presented but revealed that H_2S may be detectable in the immediate vicinity of the plant. It is highly unlikely that the receptors could distinguish the odor source at these low concentrations. The results are primarily due to the substantially lower emission rates from the trickling filters. During this period, the filters are also less likely to emit slugs of H_2S because of the lower loadings being applied and the cooler temperatures during the winter.

Potential Offsite Odor Sources

The odor contours shown in Figures 4-3 and 4-4 represent the impact only from Willow Lake WWTP. Other sources of odor are not represented by these contours. Other potential sources of odor include the collection system, dairy farms, and other miscellaneous sources. These sources can have a substantial effect on the perceived impact of Willow Lake. Because the plant does produce odors and is a readily identifiable source, it may receive complaints for odors that are produced by offsite sources.

The collection system that delivers wastewater to Willow Lake WWTP has two large gravity mains that run through Keizer on their way to the plant. Odors can be emitted from manhole covers and lift stations. These sources can produce strong localized odor contours that are subsequently blamed on the treatment plant. No work has been performed to date to identify and quantify collection system sources.

Other odor sources outside the plant boundary include a dairy operation in West Salem south of the plant. The dairy spray irrigates the contents of their treatment lagoons. This practice is accepted in the agricultural community but can produce extremely intense odors. Because the prevailing winds are from the south and west, Keizer may be impacted by these activities. Additional sources of offsite odor may also be present but to date are not identified.



Section 4 Baseline Odor Contour Modeling

Introduction

This section presents the results of emissions rate calculations, the methodology used to produce odor contours, and the results of the baseline canning and baseline non-canning season odor contour modeling. The information presented in this section relies heavily on the calculation procedures and input parameters presented in Appendixes A and B in Volume III.

Plant Emissions Rate Estimation

During Phase 1, comprehensive screening was conducted to characterize the species causing the odorous emissions for each process and then to rank each process on the basis of its emission rate. During Phase 2, sampling was conducted first to identify the baseline for odor emissions for each process during non-canning season and then to measure the effectiveness of chemical addition to reduce odors during the canning season. The characteristics of the odor and the relative ranking of the process emissions were then used to support recommendations for the most cost-effective control options.

Odor Indicator Compounds

Of all of the compounds analyzed, hydrogen sulfide was the most prevalent odorous compound, and it was used as a common unit of measure for ranking the processes by their emission rate. H_2S and odor showed excellent correlation according to D/T odor values for H_2S published in the literature (Reference 14). The results of odor bag or hydrogen sulfide analyses were calculated to give an emission rate on the basis of hydrogen sulfide. Example calculations for the point source and area mass emission rates are presented in Appendix A to this report.

Emission Route Calculation for Measured Sources

For point sources, such as the bar screen stack, the gas velocity, the stack or vent diameter, and the concentration of the compound were measured in order to calculate a mass emission rate. For area sources, such as the primary clarifiers and open channels, the flux chamber was used to collect emission rate data. An emission rate for the flux chamber is calculated by measuring the sample concentration, the sweep air flow rate, and by recording the flux chamber surface area. The flux chamber emission rate is then scaled up from the known chamber surface area to the surface area of the open area source for a total mass emission rate.

Assumptions for Sources Not Measured

Hydrogen sulfide emission rates for sources that were not measured were estimated based on the emission rate for known sources. For example, the channels between the headworks and the primary clarifiers were not sampled. It was assumed that the unit emission rate from the channels was the same as for the headworks. A total emission rate was then calculated using the channel area. For the sludge storage lagoons, the measured odor values for the anaerobically digested sludge at Unified Sewerage Agency (Reference 7) were used. This material is very similar to that stored in Willow Lake's lagoons. Because USA's sludge has been mechanically dewatered, resulting in a more concentrated sludge, the emission rate from this material is conservative for Willow Lake.

For other processes where measurements were not collected, measured values at adjacent processes and channels were used. In the case of similar process units, such as the north and south primary clarifier, a measured value for one process was assumed for the other process units. In all cases, conservative emission rates were assumed so that true worst-case odor contours would be generated.

Canning Season vs. Non-Canning Season Baseline Contours

Table 4-1 shows the calculated emission rates for all sources used to generate odor contours. The most notable contrasts that can be drawn from the table are the difference in emission rates of the trickling filters between canning and non-canning season. During non-canning season, the odor emission rate is 0.26 grams per hour assuming three filters on line. This represents a very small percentage of the total plant emissions. The largest sources during this period are the north primary clarifier weirs, the bar screen stack, and the raw sewage pump station stack.

During canning season, the trickling filter emission rates increase to 436.48 grams per hour and dominate all other sources from the plant. The primary clarifiers, bar screens, raw sewage pump station headworks, and sludge lagoons are the other significant sources at the plant. These secondary sources have a combined emission rate of 167 grams per hour or 27 percent of the total plant emissions. This leads to the conclusion that, in order to reduce odor emissions from the plant, the trickling filter emission rates must be reduced. It should be pointed out that the odor emissions from the trickling filters are up to 100 times higher ("burp" events) under certain meteorological conditions than the values shown in Table 4-1. This is discussed in Section 3.

Table 4-1
Baseline Canning and Non-Canning Season
Calculated H₂S Emission Rates

Source	Emission Rates	
	Canning (g/hr)	Non-Canning (g/hr)
Trickling Filters (Average)*	436.48	0.26
Bar Screen Channel Stack	27.46	13.00
Raw Sewage Pump Station	23.73	13.00
Headworks		
Grit Storage Truck	0.13	0.16
Headworks Effluent Channels	6.19	4.98
Screenings Box	0.02	0.02
Grit Classifiers	0.001	0.001
South Primary Clarifiers		
Surface	17.16	n/a ^b
Weirs	43.99	n/a ^b
North Primary Clarifiers		
Surface	12.81	0.32
Weirs	26.97	0.67 ^c
Sludge Storage Lagoons	8.76	5.84
Gravity Thickeners	0.11	1.33
Wet Wells		
RAS Pump Station Wetwell	0.09	0.09
SPE Pump Station Wetwell	3.63	n/a
TF Recycle Wetwell	1.48	1.48
Subtotal	609.01	64.76
Channels		
N. Primary Clarifier Scum Box	0.03	0.03
Chlorine Contact Channels	0.32	0.32
TFE/RAS Mixing Flume	1.40	1.40
WAS Flow Splitter	0.01	0.01
Channel from N.P.C. to T.F.P.S.	0.11	0.11
Channel from SPC to SPE P.S.	0.11	n/a ^b
Channel to N. primary clarifiers*	0.46	0.46
Channel to S. primary clarifiers	0.46	n/a ^b
Subtotal	2.90	2.33
Miscellaneous		
S. Secondary Clarifier weirs	0.176	0.176
Chlorine contact effluent weirs	0.006	0.006
Digester feed box	0.011	0.011
Digester effluent box	0.011	0.011
Digester pressure relief	0.011	0.011
Digester roof seal	0.029	0.029
DAFT units	1.12	0.00
S. Secondary Clarifiers	1.72	1.72
Mixed liquor flow splitter	0.003	0.00
Subtotal	3.09	1.97
Total	615.00	69.06
*Canning season trickling filter rates increase 100 times during "burp" events. ^bSouth primary clarifiers are not operated during non-canning season. ^cWeirs were not measured. This value was calculated based on canning season surface to weir ratio.		

Odor Contour Modeling Methodology

Air Quality Dispersion Model

The Industrial Source Complex-Short Term (ISCST2) (Reference 3, 6, 8) air quality dispersion model was used to predict odor levels outside the site. ISCST2 is a U.S. Environmental Protection Agency (EPA)-approved air quality dispersion model used to predict downwind pollutant concentrations from a variety of sources. Version 92062, the latest version of ISCST2 contained in the Users Network for Applied Modeling of Air Pollutants (UNAMAP), was used. The model was run using the rural- and simple-terrain modes. Model input parameters for all scenarios are presented in Appendix B in Volume III.

Based on the emission rates presented previously for the baseline canning and non-canning seasons, emission rates were determined for three odor control alternatives. The alternative contours are based on various levels of control of the canning season emission levels. Odor contours for these control alternatives are presented in Section 5. For purposes of modeling, the source emission rates were assumed constant for all hours of the day. Canning season exceedance concentrations have been reduced 100 times to compensate for the "burping" phenomenon of the trickling filters.

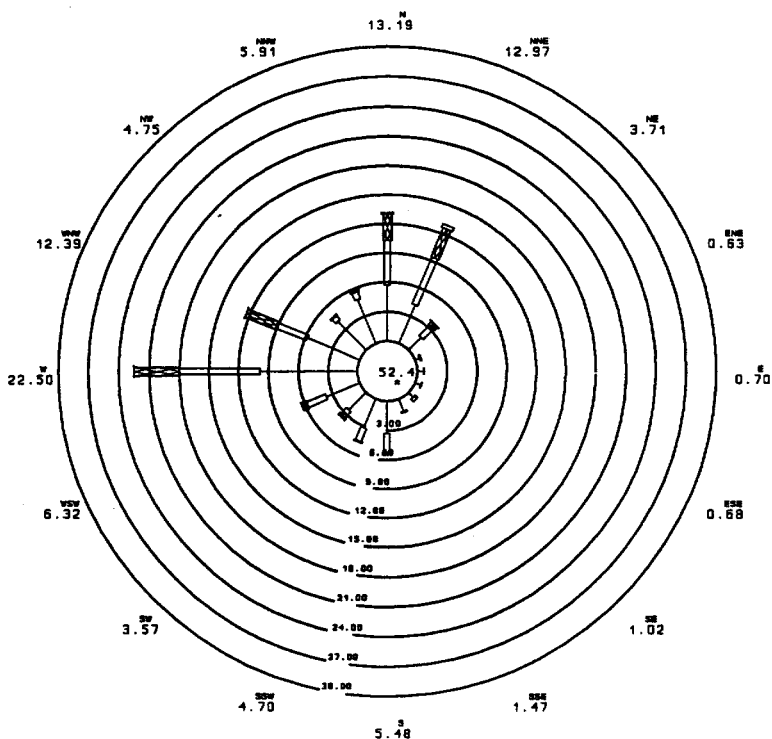
Meteorological Data

The model was run using meteorological data collected onsite. The data were collected from May 1991 to September 1992. Measurements of wind speed, wind direction, temperature, relative humidity, and barometric pressure were recorded every 15 minutes. These data values were reduced to produce the modeling input file. In order to simulate airport data and their use in EPA-type models, wind speeds less than or equal to 1 m/sec (2 knots) were set equal to 1 m/sec and the previous valid hour's wind direction substituted for the hourly wind direction value. In this way, calm winds, defined as winds less than or equal to 1 m/sec, were removed by the calm processing routine in the model.

For modeling the non-canning scenario, meteorological data from January 1 through May 31 and October 16 through December 31 were used in the model. For all other scenarios, meteorological data from June 1 through October 15 were used in the model. Figures 4-1 and 4-2 illustrate the prevailing winds during both of these periods.

During canning season, the primary wind pattern is from the west and north (Figure 4-1). In contour modeling, this has the tendency to push the plume east and south (i.e., over the most developed areas of Keizer). During the period of measurable winds, about 72 percent of the wind is coming from the directions west to north by northeast. Winds are calm or less than 1 meter per second 52.4 percent of the time.

During non-canning season, substantially more wind comes from the south (Figure 4-2). North and west winds are also prevalent. During the more unstable conditions observed



HOURLY AVERAGE SURFACE WINDS
PERCENTAGE FREQUENCY OF OCCURRENCE

STABILITY CLASS: ALL

STATION LOCATION: WILLOWLAKE - SALEM

• CALM PLUS LOWEST VELOCITY CLASS

INCLUSIVE DATES: JUN 1 - OCT 15

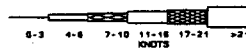
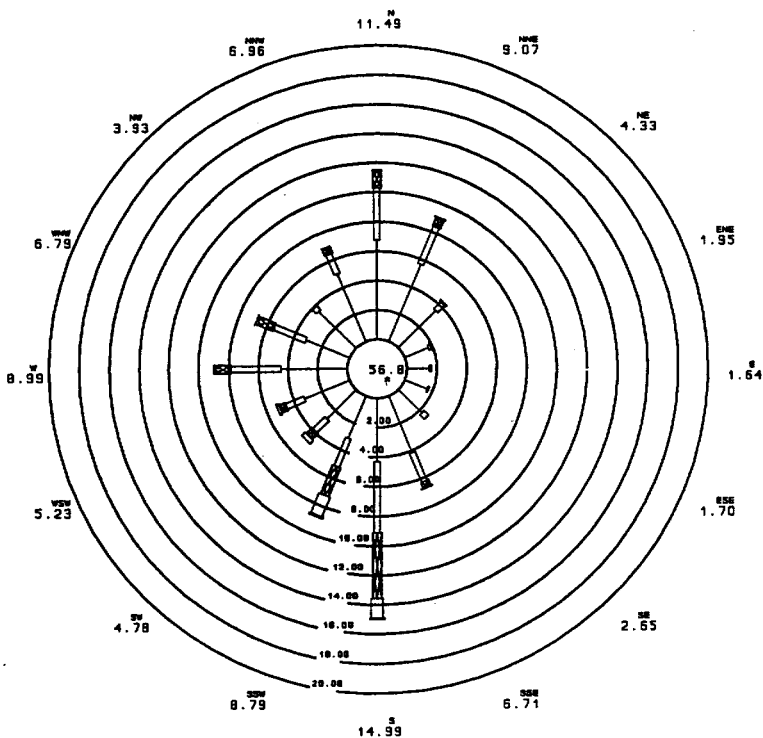


Figure 4-1
Canning Season Wind Rose



HOURLY AVERAGE SURFACE WINDS
PERCENTAGE FREQUENCY OF OCCURRENCE

STABILITY CLASS: ALL

STATION LOCATION: WILLOWLAKE - SALEM

• CALMS PLUS LOWEST VELOCITY CLASS

INCLUSIVE DATES: OCT 16 - MAY 31

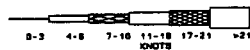


Figure 4-2
Non-Canning Season Wind Rose

during the winter due to storms, etc., the plume will be shifted more to the east and elongated in a north and south direction. Winds are calm or less than 1 meter per second 56.3 percent of the time.

Receptor Grid

In the canning season scenario, ISCST2 was used to evaluate odors at discrete receptors located along a 10- by 10-km rectangular grid centered on the facility. Receptors were spaced every 200 meters out to 1,000 meters in each direction, then spaced every 1,000 meters out to 5 kilometers. In all other scenarios, discrete receptors were located along a 6- by 6-km rectangular grid centered on the facility. Receptors were spaced every 500 meters out to 3,000 meters in each direction. All receptors were evaluated at ground level and assumed to be the same elevation as the site. This is a reasonable assumption based on the geography around the plant.

Baseline Odor Contours

The emission rates and modeling methodology discussed above were used to develop an estimated odor impact footprint resulting from operations at the Willow Lake WWTP. Two basic contours have been generated: one for canning season, and one for non-canning season. The contours represent the frequency with which two concentrations of H_2S are exceeded. The concentrations selected for this modeling effort have been selected at 100 and 300 ppb as H_2S .

The actual odor threshold for H_2S has been reported in the literature (Reference 14) between 0.1 and 1 ppb; however, experience has shown that the large majority of the population do not find this level of H_2S offensive. The character of odor below 100 ppb can be generally described as "musty" and is similar to the smell of an old basement. At 100 ppb, the "rotten egg" character begins to become more noticeable and will generate a small number of complaints. At 300 ppb, even insensitive receptors find the odor obnoxious and will begin to complain. For this reason, we have selected 100 and 300 ppb have been selected as the odor complaint window for modeling purposes.

We have chosen to represent the contours in terms of frequency of exceedance rather than concentrations under worst case meteorological conditions. This was done to relate the seasonal and diurnal component of the impact footprint. The frequencies of exceedance chosen to generate the contours were 10, 1, and, for some alternatives, 0.1 percent of the period modeled. Canning season emissions were modeled from June 1 through October 15 (147 days). Non-canning emissions were modeled for the remainder of the year (218 days).

During canning season, 1 percent exceedance would represent a total period of about 35 hours. This is the frequency of occurrence that typically generates complaints by the public. Exceedance of 10 percent represents about 350 hours. This exceedance is spread out over the most unfavorable meteorological conditions. These conditions typically occur late in the evening as the temperature begins to drop. Unfortunately, this period of the day coincides with the highest emissions rate from the trickling filter and the time when most people are wrapping up summertime outside activities and going to bed. Conceivably, this

1 percent exceedance (35 hours) could be spread out 1 hour per day for 35 of the 147 days modeled. Because of this, the 1 percent contour may generate complaints up to 25 percent of the days during the season. A similar, more drastic impact is associated with the 10 percent exceedance contour.

During non-canning season, 1 percent exceedance would represent a total period of about 52 hours during the period modeled. A large portion of the non-canning season coincides with winter. This is significant because most people are not involved in outside activities to the extent they are during the summer. It is also more common for people to retire to their homes earlier during the winter because it gets dark earlier. This phenomenon tends to counteract the situation described above for the canning season. Even if the outside concentration of H_2S is noticeable, those inside may not notice. The significantly lower emissions rates in combination with more favorable meteorological conditions and less outdoor social activities explain why Willow Lake does not receive a significant number of odor complaints during the non-canning season.

Canning Season Impacts

The estimated odor contour generated for canning season is presented in Figure 4-3. The 1 percent exceedance contour for both the 100 and 300 ppb H_2S concentrations extends a significant distance from the plant. In fact, the 6-mile-square receptor grid used to compute model results did not cover the entire 1 percent exceedance contour for the 100 ppb concentration; however, the general trend is quite apparent. The odor plume extends primarily east, directly over the more developed areas in Keizer. The plume also extends north and south but to a much lesser degree. This coincides with canning season windrose presented earlier.

The 10 percent exceedance contour (350 hours during canning season) for the 300-ppm H_2S concentration extends approximately 0.5 miles east of the plant and 0.25 miles north and south. The 10 percent at 100 ppb H_2S contour extends 0.7 miles east and slightly over 0.5 miles south.

A large portion of the area between the 10 percent contour and the 1 percent contour exceeding 300 ppb falls outside the designated special interest area. The area to the south of the plant covers a newly developed residential area. The area to the east covers residentially zoned property that is currently undergoing development. Significant additional area between the 100 and 300 ppb contour falls over developed portions of Keizer. As described earlier, this area represents the transition from high numbers of complaints to infrequent complaints due to odor.

Based on the information shown in Figure 4-3, Willow Lake WWTP impacts a substantial portion of incorporated Keizer 35 hours each year during canning season. This impact footprint is consistent with the increasing number of odor complaints received by Willow Lake staff as development occurs closer and closer to the plant. Potential impact is observed a significant distance from the plant, but less frequently.

Table 3-2
Analytical Methods and Target Compounds

Water Phase		
Primary Constituents		
Volatile organic compounds		
(1) GC/MS, full-scan		
(2) GC/MD, 33 component target list		
Volatile organic acids		
(1) Titration, total organic acids		
(2) LC/MS, speciated volatile acids		
Speciated sulfur compounds		
(1) GC/FPD		
Secondary Constituents		
Biochemical oxygen demand, BOD ₅		
Chemical oxygen demand, COD		
pH/temperature		
Sulfide, S ₂		
Ammonia, NH ₃		
Vapor Phase		
Volatile organic compounds		
(1) EPA TO-14 (GC/MS scan) full-scan		
(2) EPA TO-14 (GC/MD 42-component target list)		
(3) EPA TO-12 (total VOC)		
Volatile organic acids		
(1) U.S. Army Method (speciated volatile acids)		
Acetic	Propionic	Isovaleric
Isobutyric	Caproic	Butyric
Heptanoic	Valeric	Octanoic
Isocaproic	Octadecanoic	Decanoic
Dodecanoic	Tetradecanoic	Hexadecanoic
Hydrogen Sulfide, H ₂ S—source and ambient		
(1) Hand-held instrument (Jerome Instruments)		
(2) Sulfide impinger		
(3) Speciated sulfur compounds, GC/FPD		
Ammonia		
(1) Impinger		
Odor Analysis		
(1) ED50 odor panel tests		
Meteorological Measurements		
WS = wind speed.		
WD = wind direction.		
T = temperature.		
BP = barometric pressure.		
RH = relative humidity.		

Table 3-3
Sample Collection and Analysis Matrix—Air Samples*

Sample Location	Unit Process	Hydrogen Sulfide	Odor	Sulfur Species	Volatile Organic Compounds	Volatile Organic Acids	Ammonia
Air Samples							
A-1	Plant influent/bar screen	▲ *	▲ *		□ ○ ▲	□ ○	
A-2	Solids storage	□			□	□	
A-2b	RS Pump station wet well				□	□	
A-3	Headworks effluent channel	□ ▲	○ ▲	○	□ ○ ▲	□ ○	○
A-4	Grit classifier bay	□			□	□	
A-5	Grit storage	□ ▲	▲		□	□	
A-6a	North primary clarifier surface	▲ *	○ ▲	○	○ ▲	○	○
A-6b	North primary clarifier weir		○	○	○	○	○
A-7a	Scum collection box	□			□	□	
A-8s	Trickling filter surface	□ ▲ *	○ ▲	○ ▲	□ ○ ▲	□ ○	○
A-8v	Trickling filter breather vent	▲ *	○ ▲	○	○ ▲	○	○
A-8i	Idling trickling filter surface	▲	▲				
A-9	Activated sludge				▲		
A-10a,b	Mixed liquor splitter box	□			□	□	
A-12a,b	RAS WWPS vent	□			□	□	
A-13a,b	WAS flow splitter box	□			□	□	
A-14a,b	Gravity thickener surface + weirs/channel	▲	○ ▲	○	○	○	○
A-15a	Digester influent box	□			□		
A-15c	Digester pressure relief stack				□	□	
A-17	Sludge storage basin	□			□	□	
A-19	DAFT		○	○	○	○	○
*See Table 3-2 for the complete list of analytical parameters.							
□ = Phase 1, Event 1, 8/28 to 8/29/91							
○ = Phase 1, Event 2, 9/25 to 9/26/92							
▲ = Phase 2, Event 1, 5/13/92							
* = Phase 2, Event 2, 8/25 to 8/27/92, 9/2 to 9/3/92, 9/8 to 9/10/92							

Table 3-4
Sample Collection and Analysis Matrix-Liquid and Solid Samples*

Sample Location	Unit Process	Sulfide	Volatile Organic Compounds	Volatile Organic Acids	Secondary ^b	Ammonia
Liquid Samples						
W-1	Plant influent/bar screen	▲▲	□○▲	□○	□○	
W-2	Headworks pump station	▲	□○▲	○	□○	
W-3(N)	Pump station effluent	□▲	□▲	□		
W-4(N)	Primary clarifier effluent	□○▲▲	□○▲	□○		○
W-5	Trickling filter effluent	□○▲▲	□○▲	□○		○
W-6	Aeration basin influent	□	□	□		
W-7	Aeration basin effluent	□○	□○	□○		○
W-8	ML splitter box effluent	□○	□○	□○		○
W-9	South secondary clarifier effluent	□▲	□▲	□		
W-10	Chlorine contact tank effluent	□▲	□▲	□		
W-11	South primary effluent	○	○	○		○
Solids Samples						
S-2	Grit cyclone effluent	□	□	□		
S-3	Grit classifier effluent	□	□	□		
S-4	RAS WWPS effluent	□▲	□▲	□		
S-5	WAS flow splitter effluent	□▲	□▲	□		
S-6	Gravity thickener effluent	□○▲	□○▲	○		○
*See Table 3-2 for the complete list of analytical parameters. ^bSecondary constituents gathered from plant process data for Phase 2 events. □ = Phase 1, Event 1, 8/28 to 8/29/91 ○ = Phase 1, Event 2, 9/25 to 9/26/92 ▲ = Phase 2, Event 1, 9/13/92 ★ = Phase 2, Event 2, 8/25 to 8/27/92, 9/2 to 9/3/92, 9/8 to 9/10/92						

**Table 3-5
Non-Canning Season Plant Flow and Loading**

Process Parameter	Value
Plant Flow	25.6 mgd
Influent BOD	215 mg/l
Influent TSS	164 mg/l
Influent VSS	124 mg/l
North Primary Clarifier Flow	25.6 mgd
South Primary Clarifier Flow	0 mgd

During the test event, the plant was operating using the trickling filters followed by air-activated sludge. No air flow was observed venting from the trickling filter breather vents. A grab sample was collected in the headspace of the breather vent for a baseline measurement. While no flow was measured, a very low flow of 0.1 liters per minute was assumed for calculating a baseline emission rate for the vents.

Between each sampling location, the flux chamber was rinsed with deionized water and wiped dry. In the middle of the event and after fluxing of the headworks, a method blank was collected from the flux chamber. The chamber was placed on a clean Teflon pad, and clean zero grade air was swept through it. Samples for odor, volatile organic compounds, and hydrogen sulfide were collected. The method blank result was <3 ppbC for volatile organic compound, <6 D/T for odor, and 0.014 ppmv for hydrogen sulfide. These very low to nondetectable levels indicate the absence of contamination in the sampling and analysis procedures.

On the day of sampling, the weather conditions were sunny, with the daytime temperature ranging from 55 to 74°F. Concentration results measured during the event are reported in Table 3-6 for hydrogen sulfide and Table 3-7 for odor. Volatile organic compound sampling results are presented in the appendixes in Volume III.

Table 3-6
Non-Canning Hydrogen Sulfide Concentration Results

Location	Concentration (ppbv) ^a	Emission Rate (µg/min-m ²)
Trickling Filter Surface	< 7.2	< 0.396
Idling Trickling Filter Surface	135	7.30
Headworks Effluent	20,000	1,062
N. Primary Clarifier Surface	47	2.56
Gravity Thickener Channel	1,600	87.26
Breather Vent Headspace	1,280	0.030
Grit Storage Truck	5,900	312
Barscreen Stack	580	740,000 ^b

^appbv = parts per billion by volume.
^bEquivalent emission rate based on stack velocity of 3,000 feet per minute.

Table 3-7
Non-Canning Odor Concentration Results

Location	Concentration (D/T)	Emission Rate ^a (µg/min-m ²)
Trickling Filter Surface	34	1.32
Idling Trickling Filter Surface	34	1.30
Headworks Effluent	707	26.5
N. Primary Clarifier Surface	17.0	0.653
Gravity Thickener Channel	424	16.3
Breather Vent Headspace	211	0.004
Grit Storage Tank	781	29.1
Barscreen Stack	296	268,500 ^b

^a1 D/T assumed to be 1 µg/m³.
^bEquivalent emission rate based on stack velocity of 3,000 feet per minute.

Throughout the test period, ambient hydrogen sulfide measurements were collected with the Jerome hydrogen sulfide monitor. Table 3-8 shows the average of three readings collected at each location. A concerted hydrogen sulfide study was collected near the trickling filters to establish a grid for hydrogen sulfide dispersion. For this event, the source strength of hydrogen sulfide was too low for a grid to be conclusively mapped. The results were at very low levels. Table 3-9 shows hydrogen sulfide measurements collected every 2 hours over the trickling filter surface and trickling filter breather vent.

Table 3-8 Hydrogen Sulfide Ambient Results from Monitoring Near Processes	
Process	Result (ppmv)^a
A-2 Rag Bin	0.036
A-3 Headworks Effluent	2.22
A-5 Grit Storage	0.19
A-6 N. Primary Clarifier	0.059
A-7 N. Scum Collection Box	0.13
A-10 MLSS Splitter Box	0.005
A-12b RAS Vent	0.021
A-13b WAS Flow Splitter Box	25
A-14b Gravity Thickener Effluent	1.5
A-15a Digester Influent Box	0.27
A-15b Digester Overflow Box	3.1
A-16 Sludge Storage Tank	0.49
Lagoons (Between 1 & 2)	0.017
Lagoons Along Street on North Side	0.019
#4 Trickling Filter Vent Stack	0.13
#3 Train Stage #4 Vent Screen	0.004
#3 Train Stage #3 Vent Screen	0.006
#3 Train Stage #2 Vent Screen	0.007
#3 Train Stage #1 Vent Screen	0.008
RAS Flume	0.012
^a ppmv = parts per million by volume.	

Table 3-9
Hydrogen Sulfide Results Collected Over the
Trickling Filter Surface and Trickling Filter Breather Vents

	Time	Surface Results (ppmv)*	Trickling Filter Breather Vent Results (ppmv)*
May 13, 1992	0630	0.012	0.001
	0830	0.010	0.006
	1030	0.016	0.006
	1230	0.012	0.077
	1435	0.141	0.017
	1700	0.24	1.69
	1910	0.18	0.149
	2100	0.065	0.045
	2315	0.105	0.042
May 14, 1992	0115	0.044	0.031
	0315	0.076	0.012
	0515	0.002	0.002
	0715	0.002	0.001
*ppmv = parts per million by volume.			

Phase 2 Event 2 Sampling

Phase 2 Event 2 sampling of the Willow Lake Comprehensive Noise and Odor Study was conducted at the Willow Lake WWTP during 3 consecutive weeks starting August 25, 1992 and concluding on September 10, 1992. The objective of the tests was to measure the effectiveness of chemical addition to reduce odors during the peak canning season. Three different chemicals were independently tested: chlorine, sodium hydroxide, and ferric chloride. Table 3-10 shows the chemical doses that were added immediately downstream of the barscreen.

Table 3-10
Chemical Addition Study Doses—Phase 2 Event 2

Chemical	Dose	Measured Parameter	
		Target	Actual ^a
Chlorine Solution	8 mg/l	>0.1 mg/l Chlorine Residual ^a	0.1 to 0.15 mg/l Chlorine Residual
Sodium Hydroxide (15 Normal)	1,800 to 2,400 gpd (70 to 90 mg/l)	pH = 8.0 ^b	pH range 6.6 to 7.3
Ferric Chloride (39% in solution)	15 mg/l	--	--
Ferric Chloride (39% in solution)	50 mg/l	--	--
^a Measured at the Primary Clarifier Effluent.			
^b Measured at the Headworks Channel.			

Hydrogen sulfide was measured as an indicator of odor emissions from the surface of the north primary clarifier, and for some periods, the trickling filter surface and breather vents. Measurements collected from the north primary clarifier were consistently steady and relatively independent of minor daily temperature variations compared to the trickling filter flows and emissions. Therefore, the data collected from the north primary clarifier most clearly represent the effectiveness of the chemicals added.

During testing, the plant influent flow averaged 27 million gallons per day, typical of the canning season. Table 3-11 shows the plant influent flow and process loading during the tests. During the testing, the influent flow was split between the north and south primary clarifiers. Only the flow from the north primary clarifier was routed to the trickling filters.

The weather conditions were typical for Salem in August and September. Most days were sunny, and only a few days were cloudy, with slight drizzle. The temperatures ranged from the 50s (°F) in the morning to the upper 80s in the afternoon. The meteorological data collected during the test period appear in the appendixes in Volume III.

At the beginning of the test, a method blank was collected from the cleaned flux chamber while it was resting on a clean Teflon pad. The hydrogen sulfide measurement was 8 ppb. During the second week of testing, the chamber was placed on a pile of wood chips, and the hydrogen sulfide measured was 11 ppb. These very low levels indicate that contamination was not a problem during the sampling effort.

**Table 3-11
Noise and Odor Testing-Phase 2 Event 2
Plant Influent Flow and Loading**

	Influent Flow (mgd)	COD (mg/l)	BOD (mg/l)	TSS (mg/l)
Site W-1 Plant Influent				
08/25/92	26.94	889	460	252
08/26/92	26.57	820	428	253
08/27/92	27.22	832	474	277
09/02/92	28.28	992	634	262
09/03/92	26.63	780	467	242
09/08/92	27.32	651	315	220
09/09/92	26.72	924	508	248
09/10/92	26.05	949	512	280
Site W-4 Primary Clarifier Effluent*				
08/25/92	26.94	486	369	80
08/26/92	26.57	451	304	82
08/27/92	27.22	515	339	76
09/02/92	28.28	467	345	79
09/03/92	26.63	398	277	65
09/08/92	27.32	334	186	92
09/09/92	26.72	500	322	94
09/10/92	26.05	571	350	104
Site W-5 Trickling Filter Effluent*				
08/25/92	26.94	212	91	105
08/26/92	26.57	215	79	103
08/27/92	27.22	222	110	99
09/02/92	28.28	227	77	90
09/03/92	26.63	203	71	94
09/08/92	27.32	159	63	110
09/09/92	26.72	176	71	92
09/10/92	26.05	210	80	95
*See Table 3-4 for site locations.				

Trickling Filter Analysis

Ventilation of the trickling filter occurs by natural convection currents that are driven by the temperature difference between the wastewater and the ambient air. At any given time, the air flow is either directed downward through the surface and exiting through the breather vents or directed downward through the breather vents and exiting out through the surface. When the ambient air temperature is less than the wastewater temperature, which commonly occurs during evenings and mornings, the air flow moves down through the breather vents and exits through the trickling filter surface. When the ambient air temperature is greater than the wastewater temperature, the air flow moves downward through the trickling filter surface and exits out the breather vents. The flow cannot simultaneously exit from both the trickling filter surface and the breather vents, since it moves only in one direction at a time. For this reason, the mass emission rate measured for the trickling filter surface is the same as the mass emission rate for the breather vents, and the entire system can be considered as only one emission source for modeling purposes.

Measurements on the trickling filter breather vents showed that the air flow is highly variable. One of the two vents for the trickling filter was covered and flow was measured from the other vent. Measured values ranged from 0 feet per minute (indicating stagnant or negative reverse flow) to over 300 feet per minute with an average flow rate of approximately 160 feet per minute. For the two vents the volumetric flow averaged 3,500 cubic feet per minute.

H₂S measurements at the trickling filter were generally low ppb readings, agreeing with previous testing. Trickling filter emissions are affected by many variables:

- The changing directional flow throughout the day
- The activity of the facultative organisms that can generate hydrogen sulfide
- The degree of aerobic versus anaerobic conditions within the filter media depending on the ventilation
- The BOD loading to the filters
- The ambient temperature

After preliminary testing was conducted at the filters, it became clear that these variables, coupled with the typically low concentrations, make it difficult to conclusively determine the effectiveness of chemical addition. For this reason, the sampling location was moved to the north primary clarifier surface. The north primary clarifier surface measurements were much more stable and repeatable, since emissions were not dependent on changing air flows, biological activity, or anaerobic conditions.

A phenomenon that was discovered during the trickling filter testing during chlorine addition was four periodic 1- to 2-minute intervals when readings from the trickling filter surface were a factor of 100 times higher than the normal ppb level readings. Reproducibly high readings for replicate samples with the Jerome analyzer verified these values. These very high readings occur when the air flow is either in transition or at a stagnant condition, and pockets of air are trapped within the filter media for an extended period of time. When this air pocket finally gets pushed out through the filter, the concentrations are much higher due to the prolonged contact time with the source. These events are termed "burp events" and represent worst case emissions from the trickling filters even though their occurrences are for limited, brief time intervals over a day.

Sampling Results

Figure 3-3 shows the percentage reduction in H_2S mass emission rates from the baseline sampling for each chemical tested. This graph shows that of the three chemicals, chlorine was the only chemical to effectively reduce the odor emissions from the primary clarifiers. Small and inconsistent odor reduction was observed for sodium hydroxide and ferric chloride addition.

It is speculated that ferric chloride was not effective in reducing H_2S in the waste stream because of the competitive reactions with organic compounds and ferric ions. This hypothesis is supported by an observed buildup in solids in the secondary treatment system shortly after the ferric testing. As the organics were oxidized in the secondary treatment process, ferric ions became available for reaction with phosphate and hydroxide ions and formed the precipitants normally associated with ferric addition. No increase in primary clarifier sludge production was observed, lending further support to this hypothesis.

It may also be speculated that sodium hydroxide (caustic) addition was ineffective due to the complex mix of organic compounds in the wastewater. In order to achieve effective H_2S control, the pH should be raised to between 8 and 9. Because the wastewater is well buffered with several organic acid systems, it was difficult to raise the pH to this value given the delivery capacity of the caustic pumps.

The dose of caustic required to attain pH 8 was between 66 and 100 mg/l as NaOH based on titration curves conducted on the wastewater. This relates to an addition rate of 1.4 to 2.1 gallons per minute (gpm) to the waste stream. The capacity of the caustic delivery system is 1.7 gpm and the pH during testing ranged from 6.8 to 7.3, well short of the 8.0 required for effective H_2S reduction. At 2.1 gpm, the cost of caustic addition is about \$1,700 per day compared to \$234 per day for chlorine.

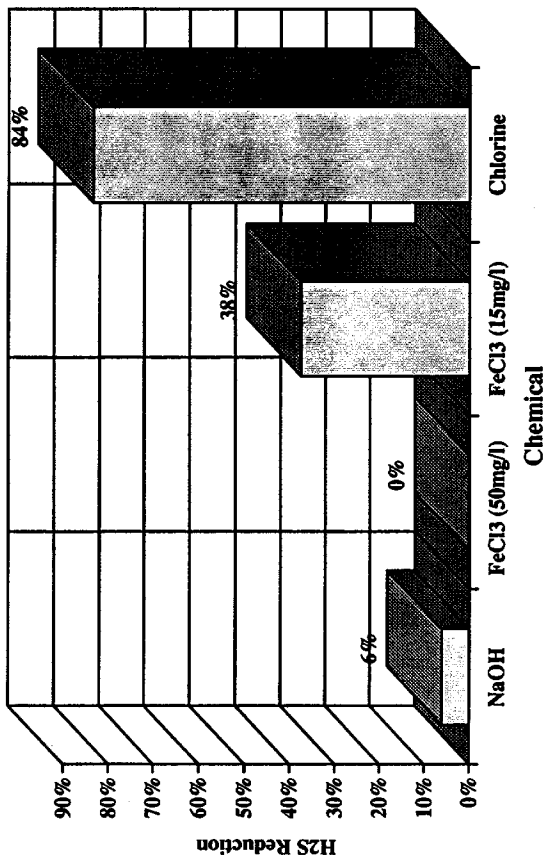


Figure 3-3
Full-Scale Chemical Addition Test Results
Willow Lake WWTP
Comprehensive Noise & Odor Study

Summary of Results for Odor and Total Hydrocarbons

During the Phase 1 peak canning season and the Phase 2 non-canning season, samples were collected to measure hydrogen sulfide, odor, and volatile organic compound concentrations. The hydrogen sulfide values were computed into emission rates and are discussed in Section 4 of this report. The odor and total hydrocarbon emission rate results are compared next.

Odor Results

Table 3-12 shows the odor emission rates for canning and non-canning seasons. The results show odor emissions are approximately one order of magnitude higher during canning season compared to the non-canning season.

Table 3-12 Comparison of Odor Results for Canning and Non-Canning Seasons		
Location	Odor Emission Rate (D/T) ^a (m ³ /hr)	
	Canning	Non-Canning
Grit Storage	NM ^b	1.55 x 10 ⁵
Headworks Effluent	1.34 x 10 ⁶	1.24 x 10 ⁵
Gravity Thickener Channel	NM ^b	3.74 x 10 ⁵
Bar Screen Stack	NM ^b	4.70 x 10 ⁶
Trickling Filter Breather Vent ^c	NM ^b	3.09 x 10 ⁶
Trickling Filter Surface	4.09 x 10 ⁷	1.17 x 10 ⁶
North Primary Clarifier	1.29 x 10 ⁶	8.23 x 10 ⁴
^a D/T = Dilution to threshold. ^b NM = not measured. ^c Based on volumetric flow, 244 m ³ /min, corresponding to a velocity of 100 fpm measured during Phase 2 Event 2.		

During Phase 2 Event 2, three odor bags were collected from bar screen stack. The odor results, 121 D/T, 106 D/T, and 123 D/T, were compared to the hydrogen sulfide result, 2,380 µg/m³. The ratio of the average odor (117 D/T) to the measured H₂S concentration (2,380 µg/m³) is 0.05. As discussed in the interim report (Reference 13), the expected ratio based on commonly reported H₂S threshold concentration is 0.07. This indicates that odor is primarily due to H₂S.



Section 4
Baseline Odor Contour Modeling

Phase 2—Sampling and Analysis

Activities conducted during Phase 2 were structured to acquire information that was not gathered during Phase 1 and focus efforts on the largest contributors to odor emissions. Phase 2 noise sampling was performed for equipment typically operated during the non-canning season.

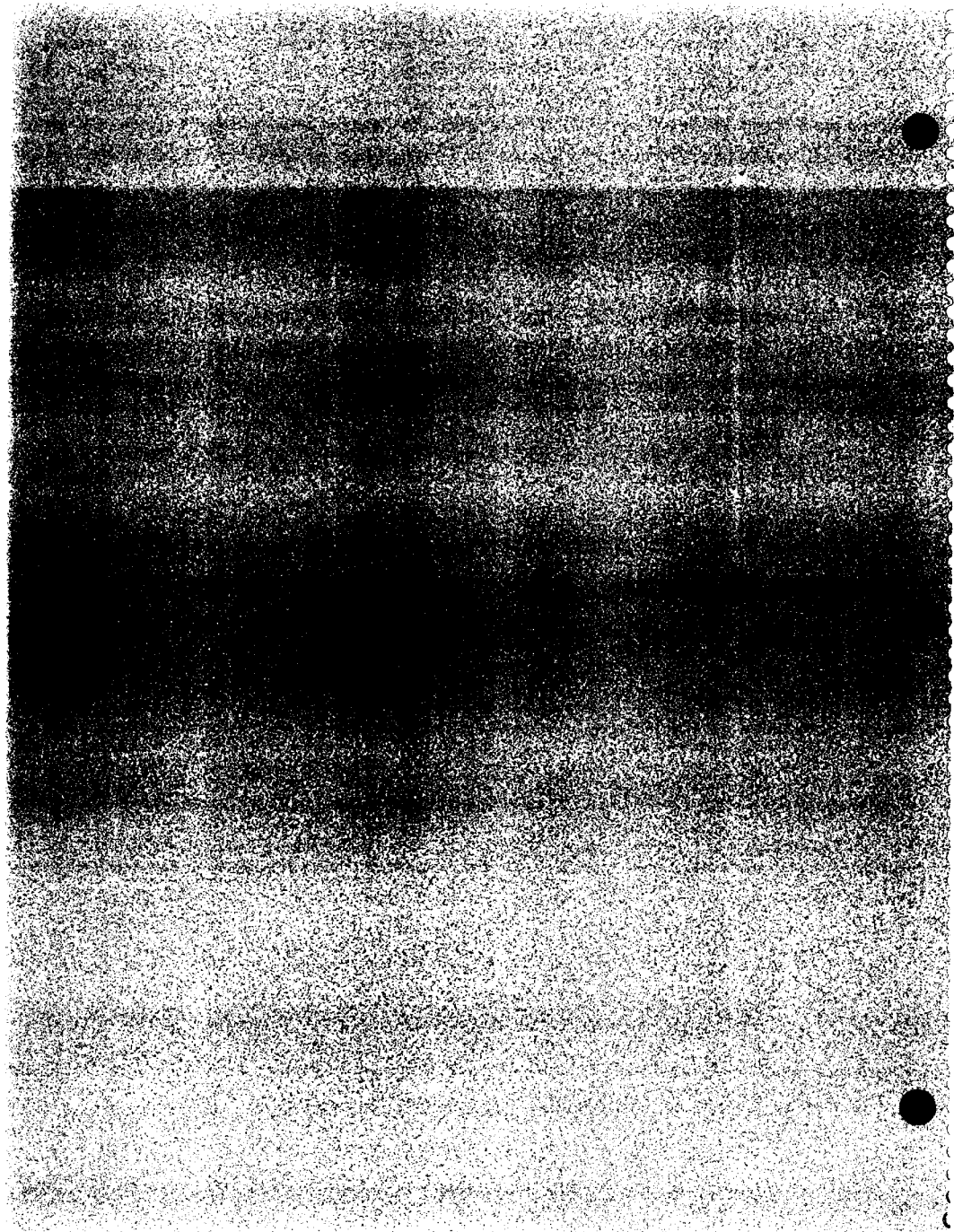
Sampling. Two sampling events were conducted during Phase 2. The first event was designed to gather emissions information under normal operating conditions without the influence of the cannery loads. Noise sampling was completed during this period as well to characterize noise emissions from equipment that was not operating during Phase 1. The second odor sampling event was structured to evaluate the effectiveness of full-scale chemical addition for odor control and to learn more about how major odor sources behaved. Chlorine, caustic, and ferric chloride were added, and emissions from key sources were measured to compare the effectiveness of the chemicals in reducing hydrogen sulfide emissions (the primary odorous compound emitted from the plant). Additional study was also devoted to learning more about the ventilation patterns for the trickling filters.

Emission Rate Estimation. Based on the sampling performed in Phases 1 and 2, odor and noise emissions were generated for the plant under canning and non-canning season conditions. Based on these emission rates, sources were prioritized and odor mitigation strategies were developed to achieve various levels of emission reduction. Emissions for the alternatives were developed by applying control efficiencies to the emitting unit processes.

Noise and Odor Contour Modeling. Noise and odor contours were generated for the baseline canning and non-canning seasons with no mitigation. Using the control strategies described above, odor contours were generated for three alternatives to reduce odor emissions from the plant. One contour for an alternative to reduce canning season noise emissions was also developed.

Final Report. This final report compiles the activities conducted during Phase 1 and 2 of the study. For detailed descriptions of Phase 1 sampling, the reader is referred to the Interim Report (Volume IV). It is the intent of this final report to present a comprehensive characterization of current odor and noise emissions from the plant, and estimate the level of impact on the area surrounding the plant. This report also develops potential odor and noise mitigation measures that would reduce the emissions footprint from the facility, and presents order of magnitude cost opinions for these measures. Recommendations are also made relating to needs for additional information.

Section 3
Sampling and Data Analysis



Section 3

Sampling and Data Analysis

This section presents the test schedule, engineering data, sampling methods, odor and total hydrocarbon air results, meteorological data, and odor complaints. Detailed results for the comprehensive characterization performed in Phase 1 are presented in the interim report (Reference 13). These results are not repeated in this text except for the purposes of comparisons of results during canning versus non-canning seasons.

Schedule

Testing was conducted during four different time periods during the 2-year study. Table 3-1 shows the dates and objective for each of the tests. The schedule was originally developed to encompass the various operating modes of the plant. Four sampling events were scheduled, as shown in the table. The first event was intended to cover early to midseason canning load emissions. The second and fourth events were scheduled to coincide with the projected peak season canning load. The third event was conducted to determine emission rates without the influence of canning loads on the plant. After the first two events were conducted, it became clear that a majority of the odors were due to H₂S emissions from the trickling filters. Because of this, the next peak canning event was restructured to provide full-scale information on potential control measures.

Table 3-1 Sampling Schedule			
Test	Date	Season	Objective
Phase 1 Event 1	8/28 to 8/29/91	Canning	Rank processes by emission rates
Phase 1 Event 2	9/25 to 9/26/91	Canning	Rank processes by emission rates
Phase 2 Event 1	5/13/92	Non-canning	Test baseline operations
Phase 2 Event 2			
Baseline	8/25/92	Canning	Odor control evaluation
Chlorine	8/26 to 8/27/92, 9/10/92	Canning	Odor control evaluation
Sodium Hydroxide	9/2 to 9/3/92	Canning	Odor control evaluation
Ferric Chloride	9/8 to 9/9/92	Canning	Odor control evaluation

Sampling Methods

For each test event, air and liquid samples were collected, and during Phase 1, samples from the solids processing train were also collected. Sample locations for non-canning and canning season are shown on the process flow diagrams in Figures 3-1 and 3-2. Meteorological data was collected beginning in May 1991 and continued throughout the study. The methods and procedures used to collect meteorological data are described in Section 3.5 of the Sampling and Analysis Plan (SAP) (Reference 10). Table 3-2 shows the analytical methods and target compounds. Tables 3-3 and 3-4 show the air, liquid, and solids train samples that were collected and analyzed for each of the four events. The reader is referred to the SAP (Reference 10) and the addenda (Reference 12) for detailed descriptions of sampling and analysis methods.

Phase 2 Event 1 Sampling

Phase 2 Event 1 sampling of the Willow Lake Comprehensive Noise and Odor Study was conducted at the Willow Lake WWTP on May 13, 1992. The objective of the test was to collect data representative of baseline plant operation without canning wastes. Air grab samples were collected to measure volatile organic compounds, reduced sulfur species, odor, and hydrogen sulfide (H_2S) emissions from the surface of the process units. A 24-hour integrated air sample was collected from the headworks influent stack gases from the morning of May 13 through the morning of May 14.

During the testing, the plant influent flow was 25.6 million gallons per day. Plant operations were normal and the plant influent was typical of baseline non-canning conditions. Table 3-5 shows the plant influent flow and mass loading during the test event. Once, during sampling setup at the headworks, the plant influent appeared milky white in color from 1500 to 1600 hours on May 13. Sampling was delayed until the influent flow at the headworks resumed its normal muddy brown color. It was believed that this phenomenon was the result of a paint spill somewhere in the collection system. Sampling was delayed because this event was structured to determine baseline air emissions from the plant. Paint or other materials such as solvents would have skewed the sampling results and not given representative emissions rates for volatile compounds and odors. The only sites tested after this occurrence were the headworks and the grit storage truck. The grit sampled was loaded into the truck bed at approximately 1430 hours before the spill event occurred.

The results of this effort are summarized below.

- Odors released at the plant are seasonal and result from a combination of 1) hydrogen sulfide generated during transmission of the wastewater to the plant, 2) increased organic loading to the plant, and 3) unfavorable meteorological conditions (prevailing winds from the north and northwest) during the summer periods.
- The canning season odor impact footprint extends beyond the currently designated Dual Interest Area (Figure 1-1).
- Odor emissions from the plant during non-canning season (winter) are negligible.
- The trickling filters are the largest emission source at the plant.
- Chlorine was the most effective chemical to reduce emissions.

The odor mitigation alternatives represent various levels of control measures at the plant to reduce emissions. Alternative 1 - Complete plant covering or encapsulation reduces odor emissions to the greatest extent possible. Alternative 2 - Priority Source Control focuses on reducing odors from the largest odor sources in the most cost effective manner. Alternative 3 - Chlorine Addition represents the lowest cost alternative and addresses minor operational control strategies.

Implementing the level of mitigation represented by Alternative 1 would result in an extremely small odor footprint at a very high cost. Because it is not feasible to eliminate 100 percent of the odors at a wastewater treatment plant, there is still a small impact near the plant within the Dual Interest Area. Alternative 2 reduces the canning season odor emissions by approximately 60 percent; however, the odor impact footprint still extends well beyond the Dual Interest Area. Alternative 3 reduces the odor emissions from the plant by approximately 8 percent and only marginally shrinks the odor impact footprint. The costs and relative odor emissions reductions for the alternatives are summarized in Table 1-1.

Table 1-1 Comparison of Odor Control Alternatives					
Alternative	Capital Cost	Annual Cost	Present Worth Cost*	Impact Reduction ^b , Acres	Relative Cost, \$/Acre
Alternative 1 - Plant Encapsulation	\$33,500,000	\$470,000	\$37,800,000	2,080	\$18,200
Alternative 2 - Priority Source Control	4,300,000	150,000	5,700,000	1,360	4,200
Alternative 3 - Chemical Addition	25,000	41,000	397,000	220	1,008
*Cost accurate to within minus 30 to plus 50 percent. Not to be used for budgeting purposes.					
^b Odor foot print reduction based on the alternative's 35 hours per year at 300 ppb contours compared to baseline canning season.					

Recommendations

Control of odor emissions from wastewater treatment facilities is a complex and often expensive task. Recommendations relating to odor control must consider the frequency of odor complaints, the reduction of the odor impact on the community, and the associated financial impacts. Because of the potentially large financial impacts associated with the alternatives above, it is recommended that a phased approach be implemented to address the odor emissions from Willow Lake WWTP. Given the findings presented in this report, reduction in the size of the Dual Interest Area is not recommended.

Phase I-Immediate Action (1993-1994)

The baseline canning season odor impact footprint shows a definite impact on the community outside the Dual Interest Area. It is recommended that the following actions be taken immediately to reduce the odor impact footprint and move toward further understanding of noise and odor emissions from Willow Lake WWTP.

- Implement chlorine addition immediately upstream of the plant to reduce odor emissions (Alternative 3).
- Investigate odor releases from the collection system and potential control measures including chemical addition.
- Identify and investigate odor sources not related to the wastewater treatment plant or collection system (sometimes called "fugitive" sources).

- Proceed with full-scale investigations of process modifications that show potential to reduce odor releases during canning season. Process modifications should be developed that will insure no degradation in Willow Lake WWTP's treated effluent quality.
- Continue collection of weather data with the plant's meteorological station.
- Implement noise control recommendations for the secondary system mixers.
- Develop and pursue a public awareness and outreach program to better educate the community about Willow Lake WWTP's mission and the service they provide to the community.

These measures are economical and will incrementally reduce the strength and daily duration of odor episodes on the surrounding community. They will also help build a body of information to incorporate into future planning efforts and help the community understand the short term, seasonal, impacts of odor at the plant.

Phase II--Mid-Term Measures (1995-1996)

The mid-term measures described below are designed to build on the immediate action items. They are somewhat more costly and should be carefully developed in light of the findings of the study and public outreach efforts described in Phase I.

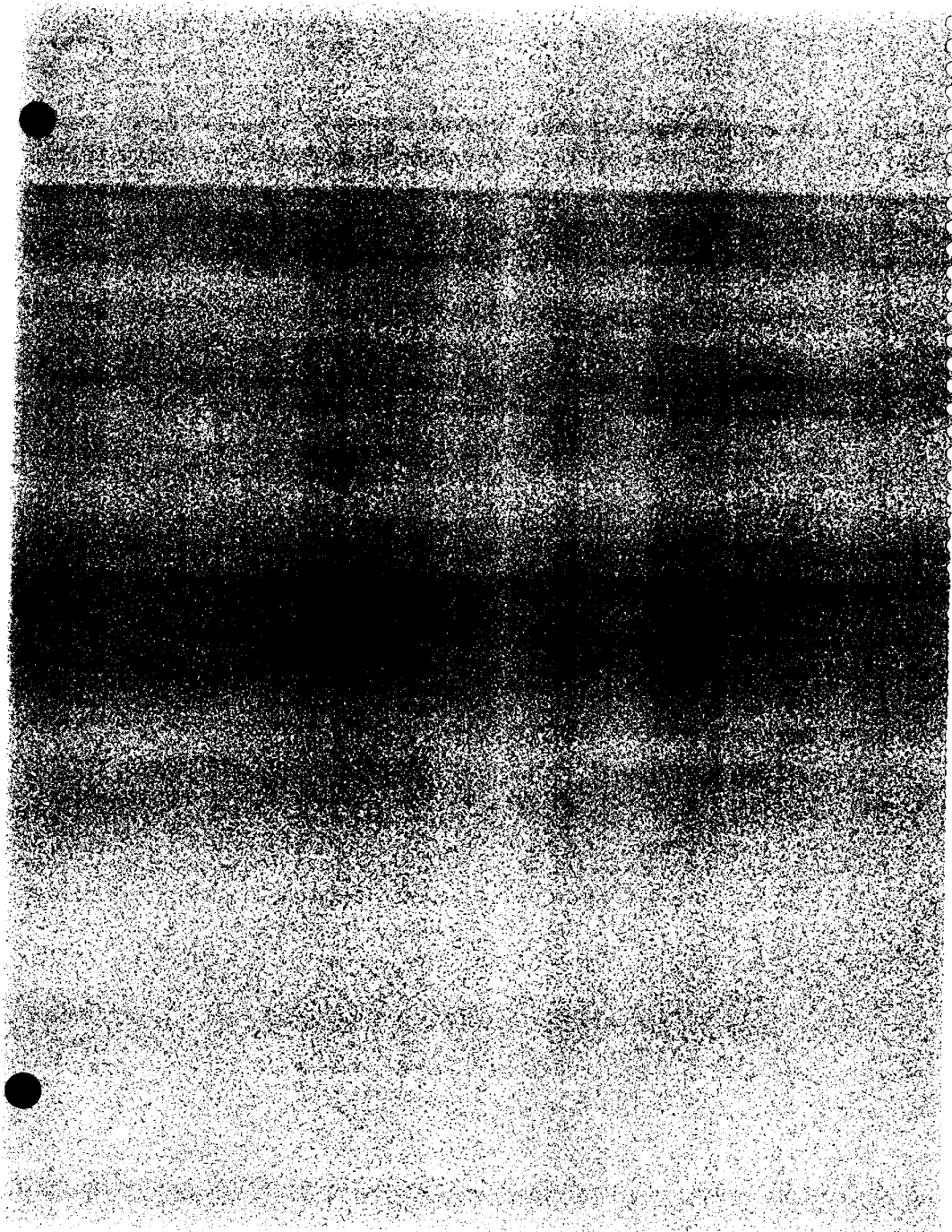
- Study modifications to the trickling filters that would reduce canning season odor emissions including: 1) innovative methods for covering the filters, 2) force ventilation, 3) replacement of rock media with artificial media to create more aerobic conditions in the filter.
- Continue public awareness and outreach program.
- Implement practical collection system study recommendations for odor control.
- Incorporate findings from Phase I and II in the Wastewater Treatment Master Plan (June, 1996).

Phase III--Long Term Measures (1997-2008)

Long term practical measures for odor control at the plant should be developed considering the long term needs of the community. The existing plant capacity is currently projected to meet the treatment needs of the community until 2008. Master planning efforts conducted during phase II will identify odor control requirements for Willow Lake WWTP as well as refine the remaining capacity projections. Process odor emissions and their control should be a primary considerations when selecting treatment processes for future plant expansion.



Section 2
Project Description



Section 2 Project Description

Introduction

This section describes background history of the Willow Lake Comprehensive Noise and Odor Study and defines the need for the project. The objectives for the study are presented and the approach to meet those objectives is summarized. This section also relates the need for this multi-phase project and the basic direction that it has taken to meet its objectives.

Background

Willow Lake WWTP is located in the north-central Willamette River valley in Marion County, near Keizer and Salem, Oregon. The plant, serving approximately 160,000 residents of Salem, Keizer, and unincorporated Marion County, is designed to treat approximately 105 million gallons per day (mgd) of domestic wastewater during the peak non-canning wet season and 35 mgd during the canning season. The canning season load dominates the waste load to the plant during the summer. Average design wet weather flow is approximately 59 mgd. The study program was developed by the City of Salem and CH2M HILL in partial fulfillment of the Dual Interest Area Agreement between the City of Salem, the City of Keizer, and Marion County. A copy of the agreement is included in the appendixes. The 2-year study has been conducted to identify and document noise and odor conditions from the wastewater treatment plant, considering seasonal operating conditions and meteorological patterns.

Need for Emissions Study

The Willow Lake WWTP is located in an area of changing land use patterns. It is located in what was once rural farmland, north of Salem along the bluff of the Willamette River flood plain. Because the area is rural, yet close to downtown Salem and Keizer, land developers have found the area prime for residential development. Potential land use conflicts have been demonstrated by the increase in odor complaints from encroaching residences over the last 2 years between operation of the Willow Lake WWTP and residential development. To demonstrate the extent of the impact, it is necessary to determine the noise and odor impact footprint of the plant.

On March 5, 1990, the City of Salem planning administrator published a dual-interest area agreement for the Willow Lake Treatment Plant area (see Volume V). The agreement involves (1) adopting a Willow Lake WWTP dual-interest area legal description defining the area in question near the facility, (2) undertaking a study to evaluate the existing noise and odor impact area and develop potential strategies to reduce the impact area, and (3) using the study results to support land use policy issues.

Other conditions of the agreement restrict the type of land use activities to those believed to be compatible with the current plant's operation. These activities include agricultural uses and industrial and commercial uses related to agriculture. The agreement also requires that any users of the special policy area:

- Be made aware of the potential effects of emissions from the Willow Lake WWTP
- Hold harmless the treatment plant operator for any adverse effects of such emissions
- Forbids subdivision of their property
- Allow all jurisdictions party to the agreement a period of comment prior to implementing land use decisions as interim control measures

This noise and odor study therefore follows directly from the City's need for a noise and odor impact analysis.

Objectives

The objectives of this noise and odor study are to quantify, through measurement and predictive analysis, the impact of emissions from the Willow Lake WWTP on the area surrounding the plant, and identify feasible mitigation strategies and associated costs to reduce this impact. This information will be used to support land use decisions within the defined special interest area surrounding the plant, for budgeting purposes should the City decide to implement an emissions mitigation strategy at the plant, and to aid in planning for future plant expansion. While they may be significant, emissions contributions from noise and odor sources outside the plant were not quantified in this study. Suggestions concerning the need for additional study are also presented.

Approach

The approach used to complete this comprehensive noise and odor study consisted of several phases. Quantifying the odor emissions of the treatment plant in a credible and scientific fashion required a significant amount of preliminary planning. To provide an understanding of the plant during different operating seasons, field programs were designed to take place over 2 years and to encompass a broad range of compounds. As data from each sampling episode was compiled, revisions to the original plan were made to focus work on the most significant emissions sources. Engineering alternatives for odor and noise

mitigation were developed based on the sampling and analysis results. Order of magnitude¹ cost comparisons were developed using information gathered from manufacturer quotes, cost curve information, and experience gained on similar projects. The project phases performed to complete this study are described next.

Planning Documents

The first phase of the project included preparation of a series of guidance documents. These documents were used as references to conduct the sampling and lab analysis and were intended to be "living" documents, updated as necessary to accommodate changes in the sampling program. They included: (1) an overall project work plan (Reference 9) describing the general requirements for completing the study, (2) a sampling and analysis plan (SAP) (Reference 10) specifying field data collection and analytical protocols, and (3) a quality assurance project plan (QAPP) (Reference 11) for assessing data quality assurance/quality control goals. These documents were issued as a three-volume set during the initial phase of the study and were updated by addendum (Reference 12) after the initial year of sampling to document changes in the sampling procedures for the following year.

Establishment of Meteorological Station

Accurate meteorological data is critical to understanding how the odor plume migrates and disperses from the plant. In preparation for air dispersion modeling, the City installed a Met One meteorological data (MET) station at the Willow Lake WWTP site in May 1991, to monitor and record local meteorological data. The station is positioned in the northeast corner of the site (Figure 2-1), adjacent to biosolids lagoon No. 4. This location meets the criteria and all relevant requirements published by the U.S. EPA (Reference 1, 5). Data collected from the system from October 1991 and September 1992 was used for the dispersion modeling.

Phase 1—Sampling and Analysis

Phase 1 sampling consisted of noise and odor measurements taken during the first two sampling events. The information presented in the planning documents was used to establish a sampling program, execute the field work, and perform the laboratory analysis. Air dispersion modeling and noise propagation modeling were conducted for the conditions that occurred during the sampling events. Air emissions were estimated and the process emissions model was calibrated using air sampling data. This information was summarized in an interim report. These activities are described in more detail below.

Data Collection and Analysis for Noise. Noise generated at the plant varies seasonally based on the equipment running for different operation modes. A study was conducted by JGL Acoustics, Inc., to:

¹Order of magnitude cost opinions are accurate to within minus 30 to plus 50 percent as defined by the American National Standards Institute.

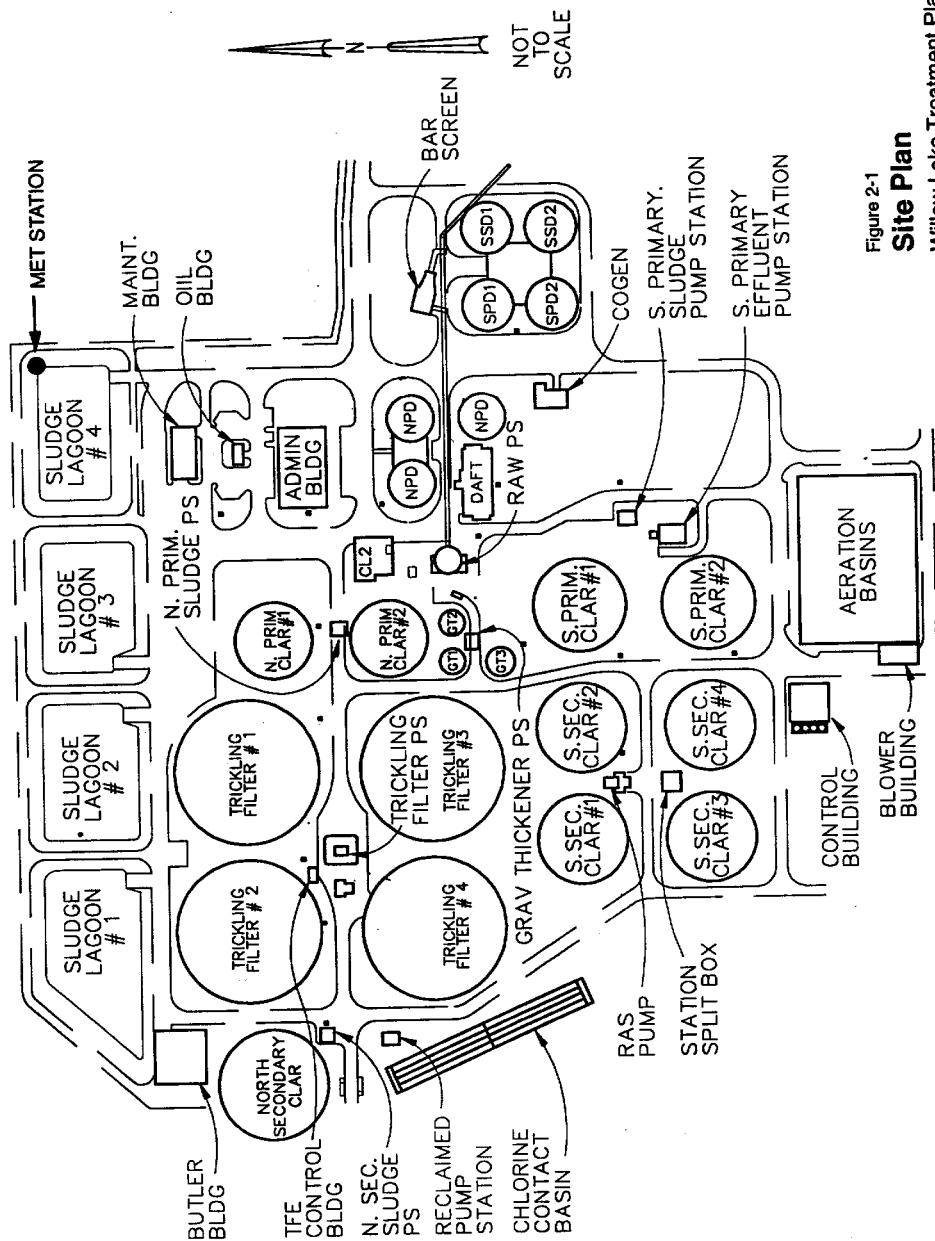


Figure 2-1

Site Plan

Willow Lake Treatment Plant

- Determine the characteristics of existing noise from the facility
- Compare the noise levels with established criteria
- Propose noise control measures that would reduce the impact in the community

Noise measurements were conducted at the plant boundary, in the nearby community, and at individual noise sources inside the plant. Phase 1 noise sampling was conducted simultaneously with the odor sampling. Because the plant operates different equipment during canning and non-canning seasons, additional noise sampling was scheduled for the following year to characterize equipment that was not operating during the initial sampling events.

Data Collection and Analysis for Odors. Two field sampling and analysis events were carried out in August and September 1991 during Phase 1. Prior to initiating any sample collection, the engineers visited the site to identify potential sources of odor and gather operational data on the plant. This effort was aided by H₂S screening data provided by the plant staff. Liquid- and gas-phase field sampling during Phase 1/Event 1 took place on August 28 and 29, 1991. Phase 1/Event 2 sampling was conducted on September 25 and 26, 1991. WWTP staff collected liquid samples and provided the laboratory analyses for secondary constituents in the liquid samples. During the two sampling events, odors were measured and characterized using ambient air screening measurement procedures and direct surface emission flux rate measures from each odor source identified.

Emissions Contour Plots. Mass emission rates developed from gas-phase field sample data were used along with meteorological data for dispersion modeling of the plant's odor emissions. The dispersion model, along with noise grid point measurements, was then used to create odor-frequency and noise-intensity contour plots around the facility. This information can graphically illustrate the plant's noise and odor impact on the surrounding community.

Emissions Control Alternatives. Mass odor emission rates from the unit processes at the plant were used to prioritize odor sources and identify potential odor-control strategies. During Phase 1, priority was given to identifying and quantifying emissions from the major plant sources. Alternatives for emissions control were identified and discussed briefly, but are not developed in depth. Noise control alternatives for equipment operating during the Phase 1 sampling events were presented in the interim report, described below.

Interim Report. An interim report (see Volume IV) was generated after the completion of the sampling, lab analysis, and modeling. This report summarized the activities of the first year and helped develop a strategy for the Phase 2 sampling. Phase 2 activities were focused to provide additional odor emission data at locations where there was the highest degree of uncertainty based on Phase 1 sampling and analysis. An addendum (Reference 12) to the planning documents was also generated to aid in conducting Phase 2 work.

Section 1 Executive Summary

Background

The Willow Lake Wastewater Treatment Plant (WWTP) treats the residential, commercial, and industrial wastes of the communities of Salem, Keizer, and portions of Marion County. The plant's environmental mission is to protect water quality in the Willamette River. The facility discharges approximately 30 million gallons of highly treated wastewater per day to the Willamette River.

The Willow Lake WWTP was originally constructed in 1963 to replace the original plant located at what is now North River Road Park. In 1975 the plant was expanded to provide additional treatment for a growing population and to meet the increasing demands of the food processing industry in the area. Since 1975 the plant has undergone several modifications to replace obsolete equipment, to improve energy efficiency, and to enhance the water quality of the Willamette River.

The Willow Lake WWTP is exceptional in the versatility it can provide for treating changing domestic and industrial wastewater loads. During the majority of the year, the plant receives only domestic wastewater produced by residents and small commercial businesses; however, during several months of the year the plant receives high strength wastewater from several food processing industries. These industries process corn, beets, squash, and many other foods and employ a large number of people in the community. Willow Lake provides cost-effective treatment for the food processing industry's wastewater. The ability of Willow Lake to provide a cost effective method to treat the wastewater is one of the primary reasons food processing continues to be a large contributor to the local economy.

Willow Lake WWTP receives wastewater from food processors from June through October and treats this waste using large rock-filled trickling filters and high purity oxygen secondary treatment. During the non-canning season domestic waste is passed over these same filters and treated by more conventional secondary treatment. Willow Lake's ability to "switch hit" for these dramatically different loading conditions is the key to its ability to maintain one of the lowest per capita treatment costs in Oregon. The conveyance of the food processing waste, however, is typically a slow process in the Salem wastewater collection system due to low flow conditions. An unfortunate consequence of this "time lag" results in waste arriving at the treatment facility in a septic condition, which by its nature contains higher levels of odors than would purely domestic waste. The odors from the wastes are subsequently released at the Willow Lake plant, primarily from the trickling filters.

There were very few residents nearby when the Willow Lake WWTP was originally sited. Initially, odors were not a primary consideration when the plant was originally designed. As the population of the community grew, the land around and near the plant began to

become more developed. In September, 1979, a zone of influence was established within the Salem Urban Growth Boundary as a part of the Comprehensive Plan Revision. This zone was designed to prevent the encroachment of incompatible uses around the treatment plant and to protect the City's investment from liability related to nuisance issues. Currently, new development is taking place outside of the zone of influence within one half a mile of the plant boundary. The proximity of new residential developments has resulted in an increasing number of odor complaints during the canning season.

As a result of the increase in odor complaints and development pressures the City of Salem, the City of Keizer, and Marion County drafted an agreement, in March of 1990, to address land use issues and the impact of Willow Lake WWTP on the surrounding community. This agreement stipulated the following:

- Establishment of a "Dual Interest Area" around Willow Lake WWTP within which land use and development restrictions would apply.
- Implementation of studies to identify 1) uses and improvements compatible with treatment plant operation, 2) land use policies that operate to reduce the impact on allowed uses around the treatment plant, and 3) practical plant modifications that reasonably mitigate noise and odor.
- Establishment of interim land use control measures in the Dual Interest Area to 1) restrict development to compatible uses, 2) requirement to sign hold harmless agreements against the treatment plant operator prior to issuing any development or building permits, and 3) forbid subdivision of any parcels.

Definition of Odor Concern

Odor emissions from wastewater treatment plants routinely occur from several sources throughout the treatment process. The severity and impact of these odors outside the plant is related to the density of human activities near a facility, number and strength of the odor sources, the specific type of odorous compounds released, and weather conditions during the period of odor release. To predict the impact of this somewhat erratic set of variables on the surrounding community, all of these variables must be quantified to the extent possible and combined into a model that predicts "impact".

For the purposes of this study, "impact" will be defined using the following elements:

- A typical range of concentrations for a representative odorous compound (for example hydrogen sulfide) that causes odor complaints
- The frequency over the course of a year when this range of concentrations are exceeded

Hydrogen sulfide gas is an odorous compound that is commonly found in sewage and in wastewater treatment plants. Comparing odor and hydrogen sulfide measurements taken at the plant, it is evident that hydrogen sulfide is the primary odorous compound at Willow Lake WWTP. Because hydrogen sulfide is relatively easy and inexpensive to measure, it serves as a representative indicator of odor.

Concentration of Odors

Below approximately 100 parts per billion (ppb) hydrogen sulfide has an odor similar to a musty basement. While it is detectable at these low concentrations it is not generally considered offensive by the vast majority of people. Above 100 ppb, a "rotten egg" smell becomes noticeable. This odor becomes stronger as the concentration increases. At 300 ppb even people with very insensitive olfactory senses will notice and be able to identify a rotten egg smell. For this reason the concentration "impact" range is defined in terms of these two concentrations, 100 ppb and 300 ppb.

Frequency of Odors

The frequency of hydrogen sulfide concentration levels high enough to be recognized is also an impact consideration. For example, if for one hour during a year objectionable levels of hydrogen sulfide occur at a resident's home, that person will probably not complain. There is a chance that during this one hour, the person may be at work or otherwise away from home, or may be asleep, or in an air-conditioned room where the odor is not noticeable. If instead, the objectionable odor level occurs 100 hours per year, it is probable that the individual will not only have ample opportunities to experience the odor but will find it nuisance enough to complain. The number of occurrences during a year that will generate odor complaints varies greatly between individuals. For this study, "impact" due to odor will be when the concentrations described above are exceeded 35 hours or more during the period between June 1 and October 15, canning season, and 52 hours or more during the period between October 16 and May 31, non canning season. This represents about one percent of the total amount of time during the year.

Study Program and Goals

The City of Salem retained CH2M HILL in the spring of 1991 in order to define sources of noise and odor emissions from Willow Lake WWTP and to develop a plan to identify and measure these emissions. The plan consisted of three guidance documents that described the equipment and data collection requirements, sampling protocol, analysis requirements, laboratory methods, and overall program guidelines. The guidance documents were intended to be a "living" documents that were updated and modified as information was collected.

A meteorological data station was installed at the plant in May of 1991 to continuously collect weather data over the period of the study. CH2M HILL and the Willow Lake staff then undertook the two year sampling and analysis effort beginning with the first sampling

event in August 1991. Three subsequent sampling events in September 1991, May 1992, and September 1992 were conducted to understand the differences between canning and non-canning season odor emissions. Noise emissions were measured in August 1991 and May 1992 to quantify seasonal differences. Study findings are reported in an interim report written after the first year's sampling and in this final report.

This Final Report specifically quantifies odor and noise emissions from the Willow Lake WWTP and the resulting odor impact "footprint" or area of influence. It identifies reasonable control measures to mitigate noise and odor emissions from the plant and presents estimated life cycle costs for mitigation alternatives. The results, conclusions, and recommendations presented have been developed to assist the City in formulating land use policy in and around the Dual Interest Area and to identify issues that should be considered in future planning efforts.

Findings

After the first year's noise and odor sampling, an interim report was produced to summarize what was learned. The significant findings in this report included the following.

- The trickling filters are the dominant source of odor emissions during canning season.
- The odor released at the plant was due mainly to hydrogen sulfide.
- Noise emissions from the plant were due mainly to large electric motors used in the secondary process during canning season.

The interim report recommended several modifications to the sampling plan to focus on the largest odor sources at the plant (the trickling filters). It was further decided that a full-scale evaluation of chemical odor control alternatives should be conducted. Three chemicals were identified as having potential to reduce odors at the plant: chlorine, caustic soda, and ferric chloride. These chemicals are commonly used in wastewater treatment for a variety of purposes and are readily available in large quantities. In addition to the non-canning season sampling event in May, a sampling event was conducted while these chemicals were added to the plant influent and measurements of hydrogen sulfide emissions in downstream treatment processes were collected.

The information gathered in all four odor sampling events and data collected from the meteorological station was compiled and used to generate odor impact "footprints" for canning and non-canning season and for three odor control alternatives. The canning season odor impact footprint from the plant is shown in Figures 1-1 and 1-2. For this Executive Summary, four contours are shown. The 100 ppb contours for 100 hours and 350 hours are shown on Figure 1-1. The 300 ppb contours for 100 and 350 hours are shown on Figure 1-2.

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VOLUME V-PHASE 1 SAMPLING RESULTS

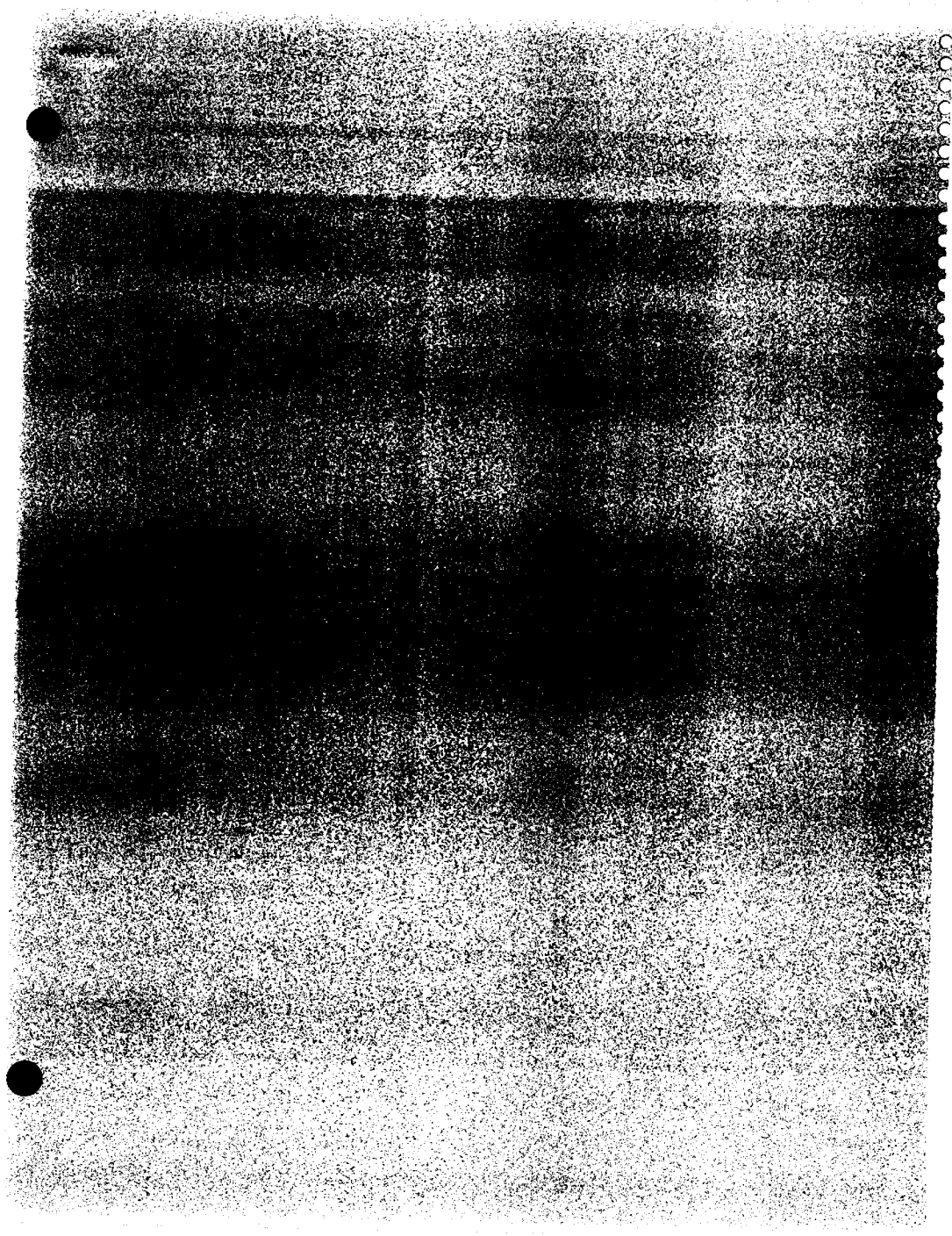
Appendix A	Dual Interest Area Agreement
Appendix B	Meteorological Station Audit
Appendix C	Laboratory Audits
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Preface

The Willow Lake WWTP Comprehensive Noise & Odor Study Report presents the results of four field sampling events, odor and noise emissions estimates, meteorological data, and contour generation to quantify impacts on the surrounding community. Volume I presents the final report and recommendations for odor emissions mitigation. Also presented are results of noise emission investigations (Volume II), field data (Volumes III and IV), and the interim report prepared after the first year of sampling (Volume IV).

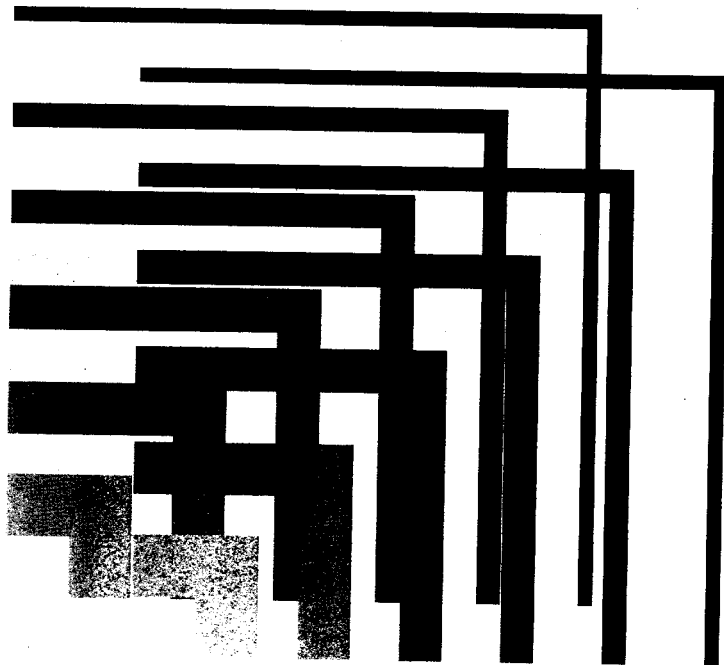
This multivolume report was prepared by CH2M HILL, Corvallis, Oregon, and is submitted to the City of Salem for their use in planning future activities with respect to wastewater treatment.

Section 1
Executive Summary



Volume I

Odor Study



Final Report

Willow Lake
Comprehensive
Noise & Odor Study

CH2M HILL



Volume I

Odor Study

Final Report

**Willow Lake
Comprehensive
Noise & Odor Study**



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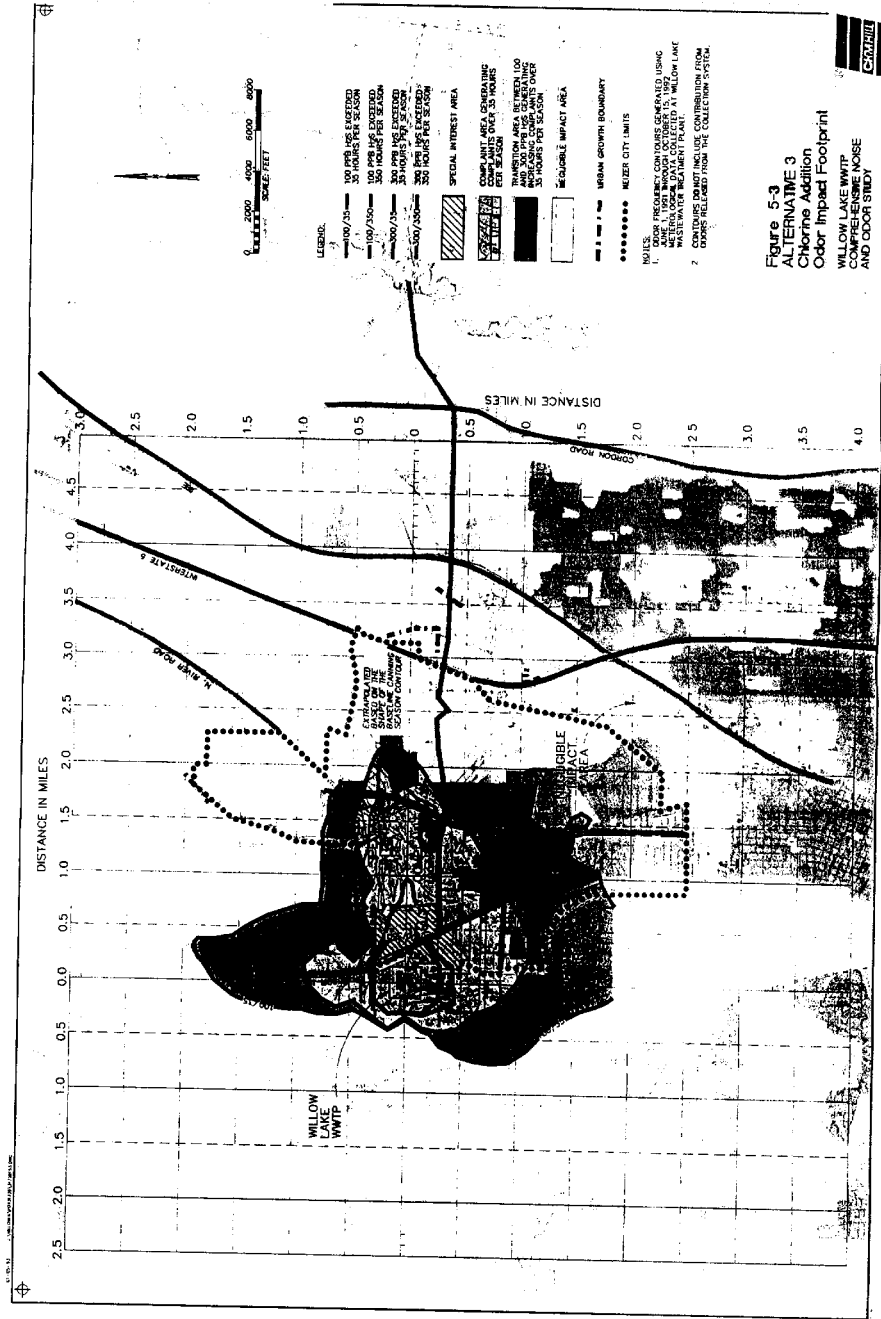
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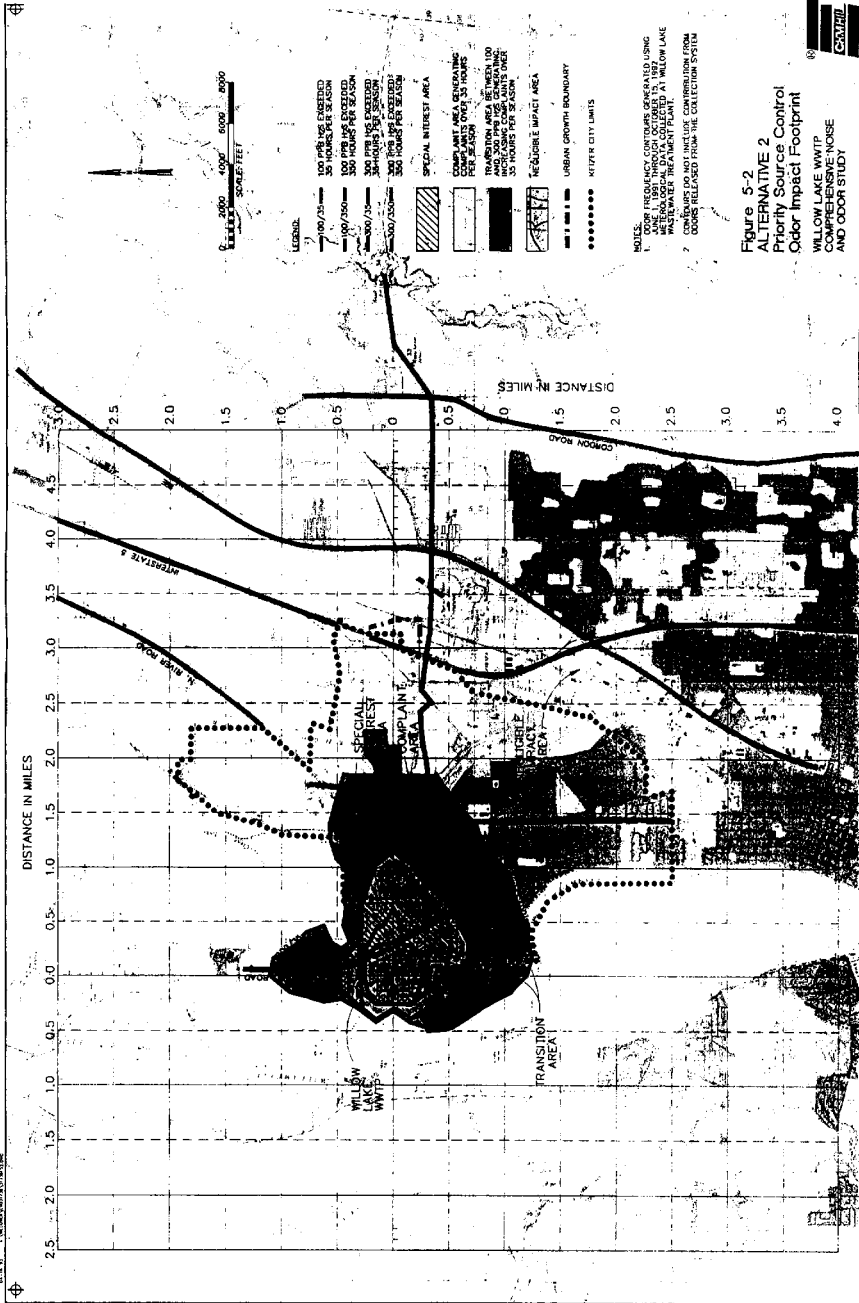
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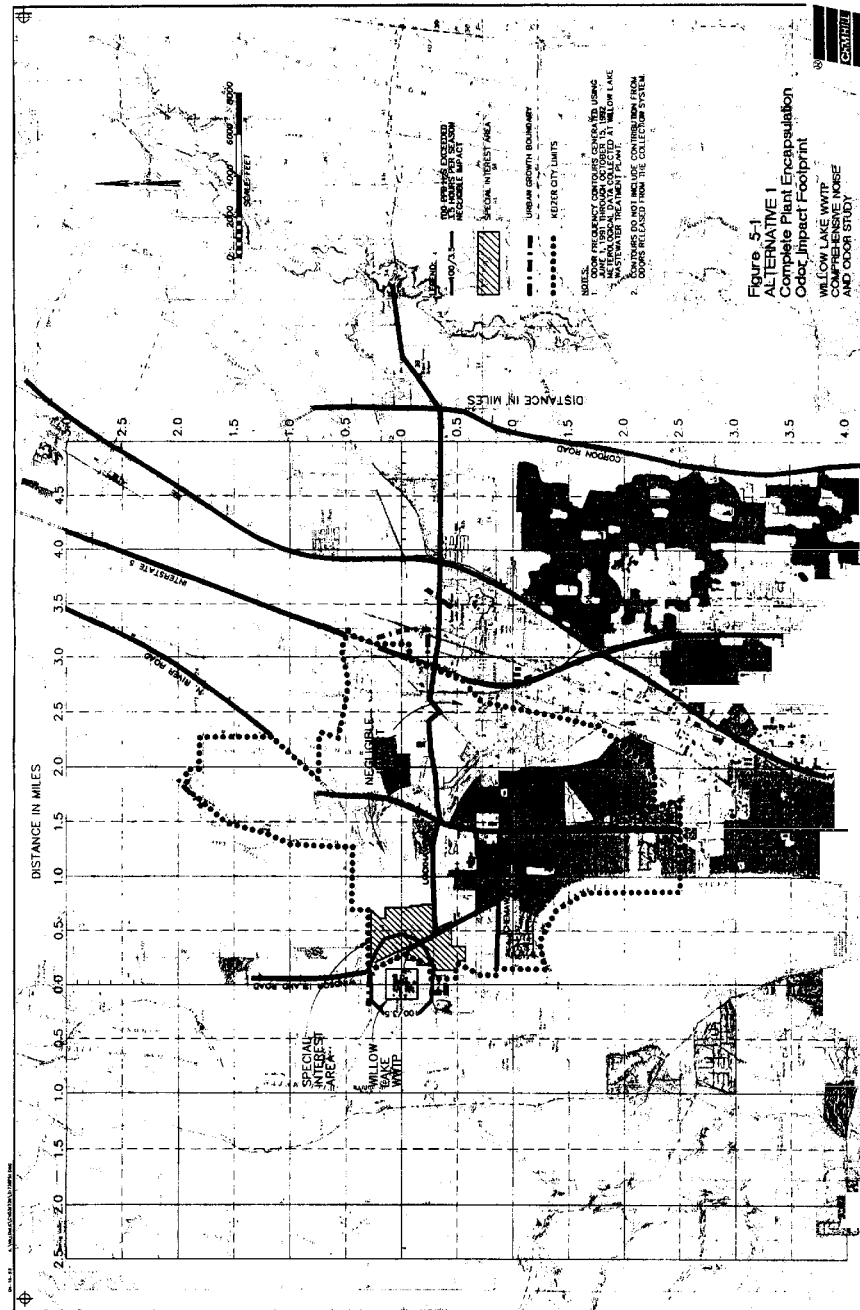
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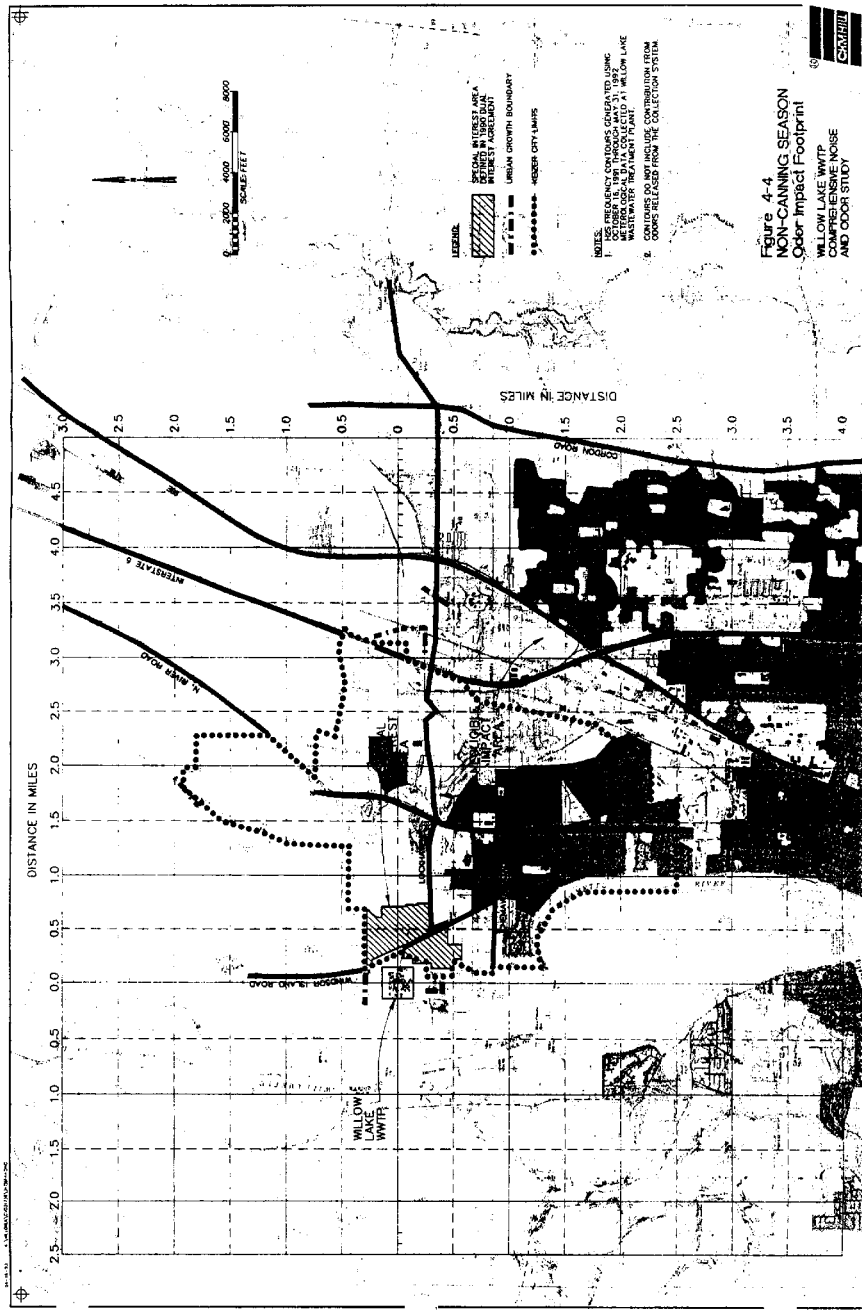


Figure 4-4
NON-CANNING SEASON
Odor Impact Footprint

WILLOW LAKE WWTP
COMPREHENSIVE NOISE
AND ODOR STUDY

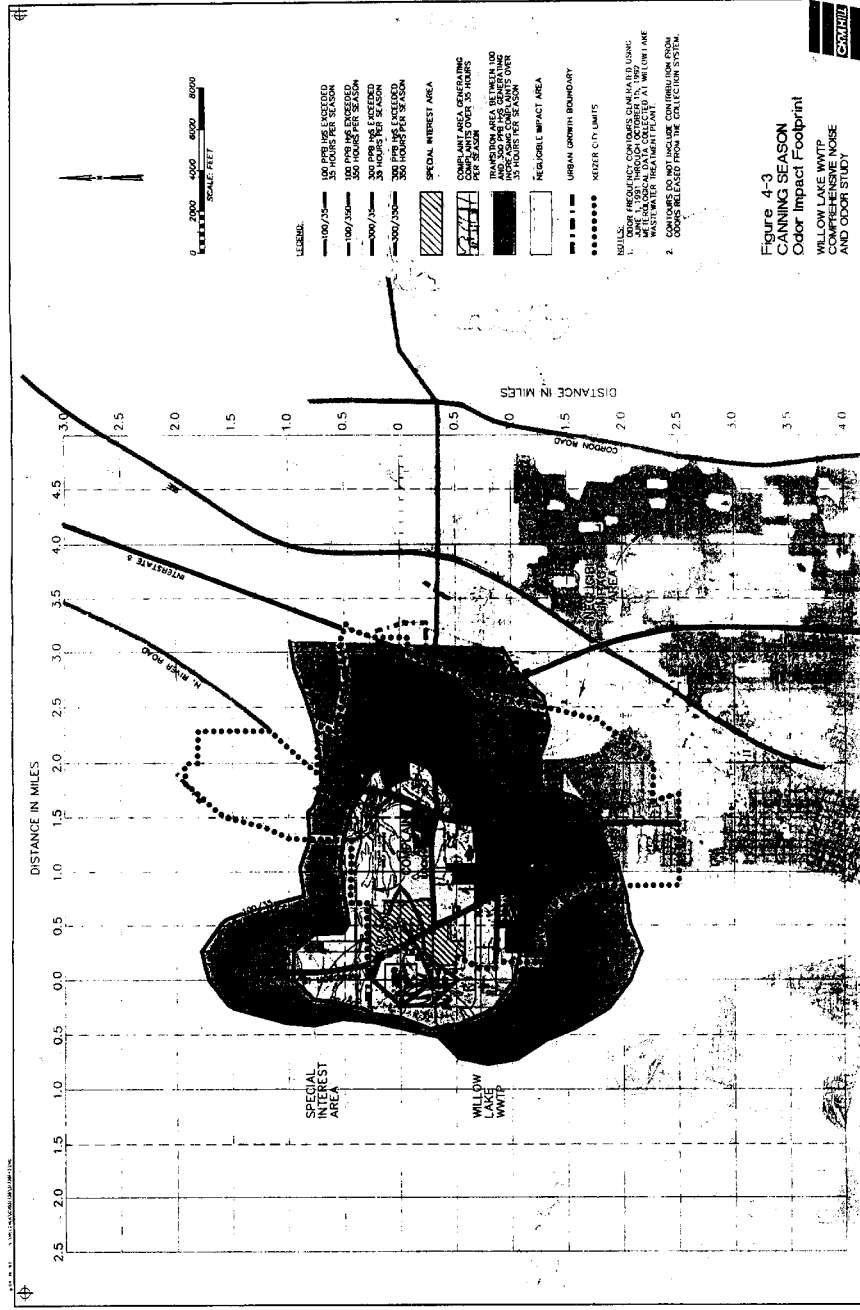


Figure 4-3
 CANNING SEASON
 Odor Impact Footprint
 WILLOW LAKE WWTP
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 AND ODOR STUDY



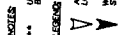


FIGURE 3-1
NON-CANNING SEASON
PROCESS FLOW DIAGRAM
CITY OF SALEM
WILLOW LAKE WWTP

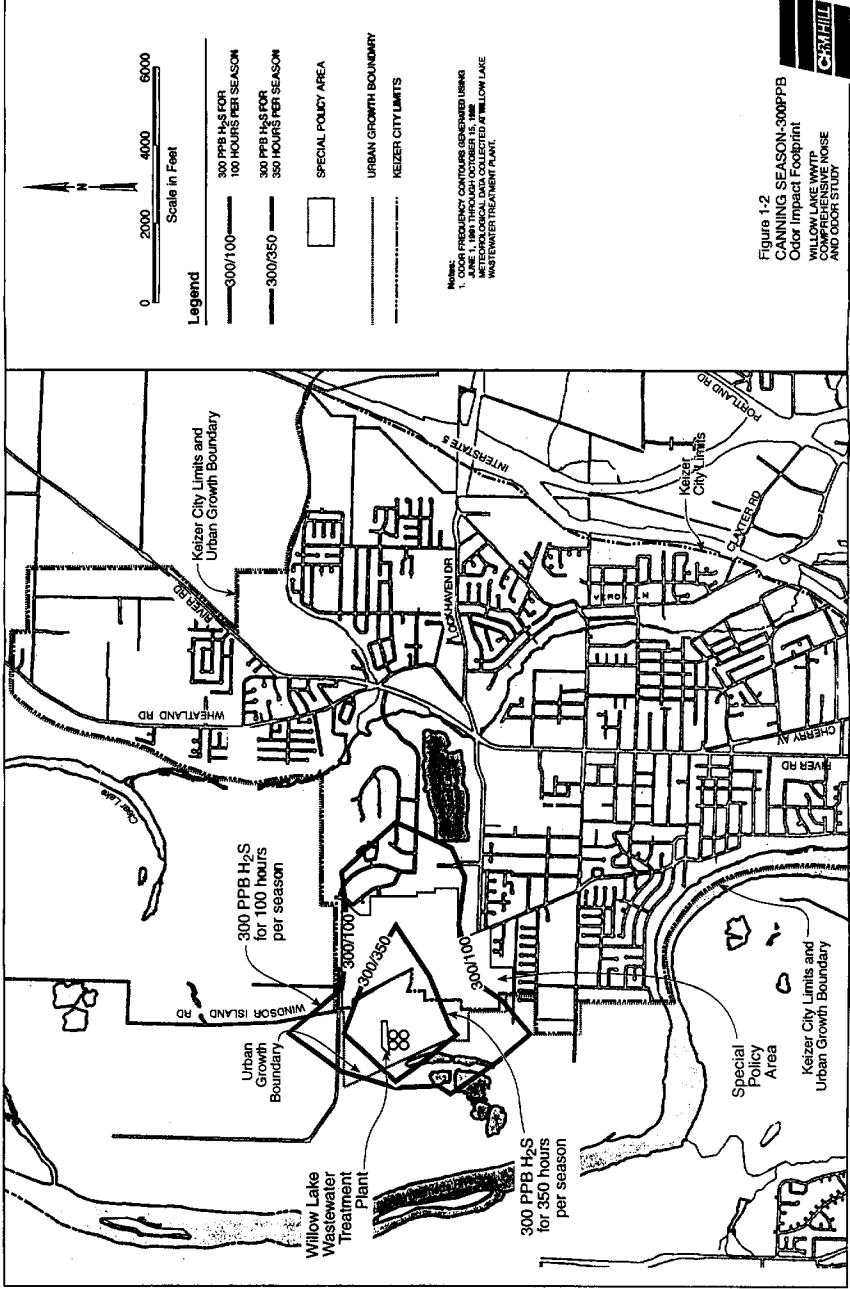
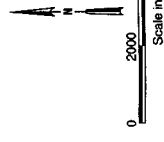
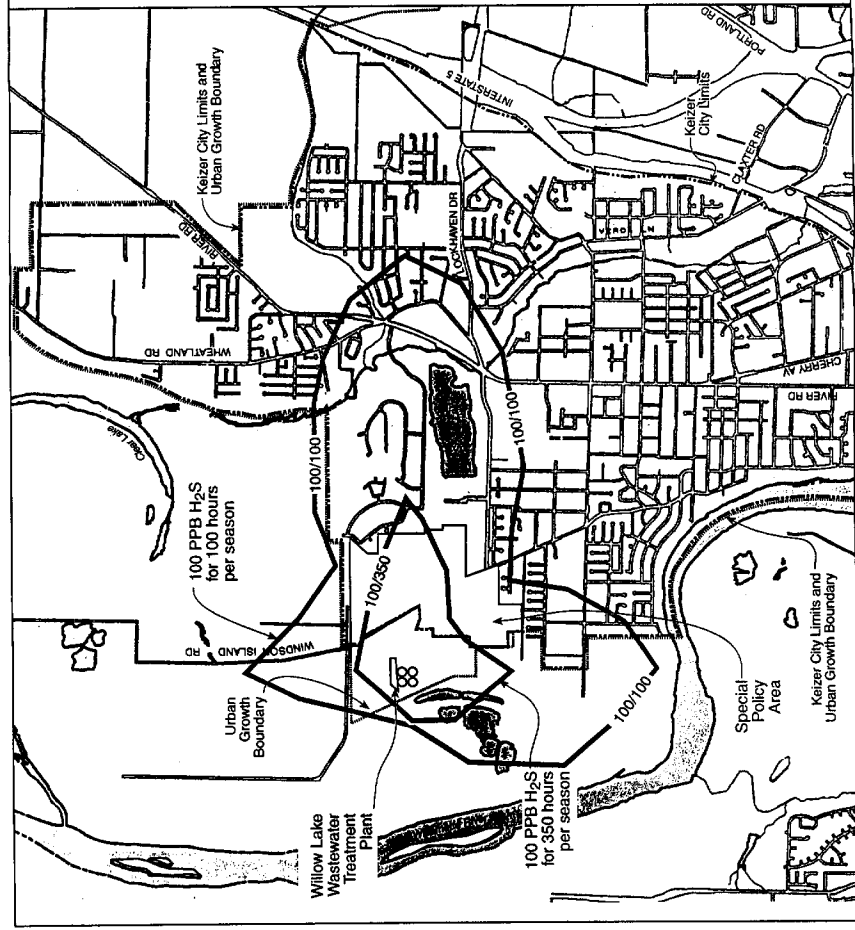


Figure 1-2
CANNING SEASON-300PPB
Odor Impact Footprint
WILLOW LAKE WWTP
COMPREHENSIVE NOISE
AND ODOR STUDY



Legend

- 100 PPB H₂S FOR 100 HOURS PER SEASON
- 100 PPB H₂S FOR 350 HOURS PER SEASON
- 100 PPB H₂S FOR 1000 HOURS PER SEASON
- SPECIAL POLICY AREA
- URBAN GROWTH BOUNDARY
- KEIZER CITY LIMITS

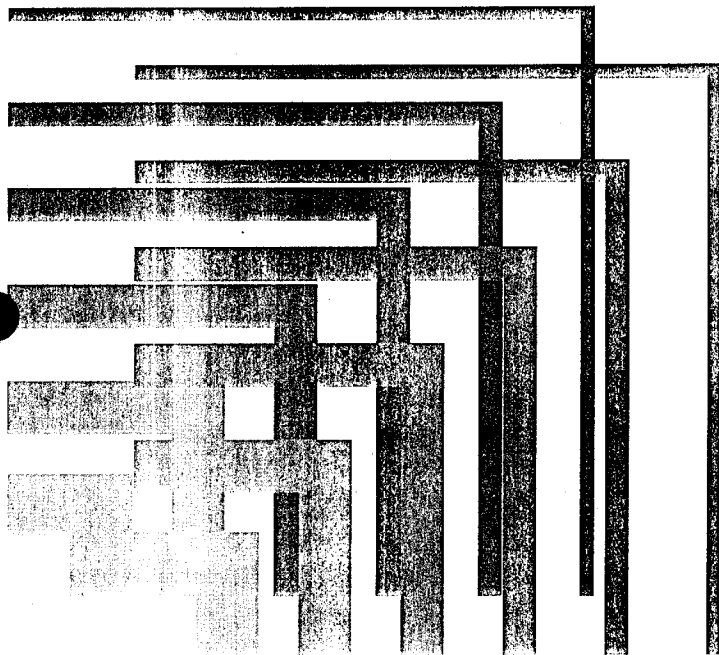
Notes:
 1. ODOUR FREQUENCY CONTOURS GENERATED USING
 2. METEOROLOGICAL DATA COLLECTED AT WILLOW LAKE
 WASTEWATER TREATMENT PLANT.

Figure 1-1
 CANNING SEASON-100PPB
 Odor Impact F_{odor} Int
 WILLOW LAKE WWTP
 AND ODOUR STUDY



Volume II

Noise Study



Final Report

Willow Lake
Comprehensive
Noise & Odor Study

CHEM HILL



Volume II

Noise Study

Final Report

Willow Lake
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Section 8 Noise Study

Introduction

This report presents the results of an environmental noise study relating to the current operation of the Willow Lake WWTP near Salem, Oregon. The purpose of the study was to determine the characteristics of any existing noise radiating from the facility, compare the noise levels with established criteria, and propose noise control measures that would reduce the impact in the community, as required.

The general approach to the noise study is as follows:

- Conduct noise measurements at the plant boundary and in the nearby community to determine existing noise levels.
- Identify significant noise sources inside the plant, and conduct noise measurements on each individual noise source to determine its source level and frequency spectrum.
- Input the source level and frequency data into a computer noise model to calculate the noise level at distant locations where it is impossible to measure the plant noise directly due to the influence of ambient noise sources.
- Use the computer model to compute existing noise level contours.
- Use the computer model to evaluate noise control procedures on significant individual noise sources.

Environmental Noise Measurements

The first step in the evaluation process was to conduct noise measurements in and around the existing facility to determine the level and character of the noise radiating from the plant. Noise measurements were conducted at a variety of locations from September 25 through September 28, 1991 during the canning season, and again from May 21 to May 22, 1992 to represent the non-canning season. The noise radiated by the plant is significantly different during the canning season due to the operation of the aeration basins and the oxygen generation facility.

Canning Season

Twenty-four-hour noise measurements were conducted at four locations surrounding the plant during the canning season as a part of this study. These locations are shown in

Figure 8-1 as Positions 1N, 2S, 3SW, and 4E. Two Larson Davis model LDL 700 noise monitoring systems were used to collect this data. The LDL 700 systems continuously monitor the environmental noise level in A-weighted decibels and they formulate noise level statistics on a 30-minute basis for the entire 24-hour day.

The results of these four 24-hour measurements are shown in Figures 8-2 through 8-5. Each figure displays three curves as a function of time. The top curve, labelled L(1), represents the noise level that is exceeded 1 percent of the time. That is to say, the noise level is below the L(1) value 99 percent of the time. The middle curve is the L(10) curve. The noise level is above the L(10) value 10 percent of the time. The lower curve, labelled L(50), represents the sound level that is exceeded 50 percent of the time.

Note that most sites exhibit a fairly small variation in sound level at night as the variation between L(1) and L(50) might only be on the order of 5 dBA. This is because there is not very much noise from local traffic or aircraft during these hours. This is precisely the time when noise from the plant is most noticeable in the community. During the daytime, there is usually enough noise from other sources to mask the noise from the treatment plant.

The results of the 24-hour noise measurements are summarized in Table 8-1. This table presents the average daytime and average nighttime sound level at each measurement location. As mentioned above, the average daytime sound level may be somewhat contaminated by noise from non-plant sources during certain hours of the day. The average nighttime sound levels are a much more accurate measure of the existing plant noise level at each location.

Table 8-1 Noise Level Summary at Primary Noise Measurement Locations		
Location	Daytime Average	Nighttime Average
1N	48 dBA	48 dBA
2S	52 dBA	50 dBA
3SW	53 dBA	53 dBA
4E	46 dBA	45 dBA

In addition to the 24-hour noise measurements at four fixed locations, 5-minute noise measurements were also recorded at nine other locations as shown in Figure 8-1. The purpose of the 5-minute measurements was to collect digital audio tape recordings of the plant noise for level and frequency analysis in the laboratory. This data was collected late at night when other sources of ambient noise were at a minimum. The results of these measurements are presented in Table 8-2.

Note that the data presented in Table 8-2 shows both the A-weighted noise level as well as the 250-Hz octave band noise level at each of the nine measurement locations. The 250-Hz

Section 8
Noise Study

Preface

The Willow Lake WWTP Comprehensive Noise & Odor Study Report presents the results of four field sampling events, odor and noise emissions estimates, meteorological data, and contour generation to quantify impacts on the surrounding community. Volume I presents the final report and recommendations for odor emissions mitigation. Also presented are results of noise emission investigations (Volume II), field data (Volumes III and IV), and the interim report prepared after the first year of sampling (Volume IV).

This multivolume report was prepared by CH2M HILL, Corvallis, Oregon, and is submitted to the City of Salem for their use in planning future activities with respect to wastewater treatment.

would result in a noticeable reduction in the noise from the plant as perceived by the community.

Figure 8-11 presents the predicted canning season nighttime noise contours around the plant if the mixer motor acoustical enclosures are installed as proposed. Note that the 40-dBA noise contour shrinks to the approximate location of the existing 45-dBA noise contour. This suggests that the net noise reduction from the plant, as a result of treating the mixer motors, is approximately 5 dBA.

Although the acoustical enclosures will reduce the noise level radiated from the aeration basin mixer motors, the enclosures will not change the character of the sound radiated by the motors. The noise will still have a pure tone component. The preliminary conclusion is that these enclosures would virtually eliminate the audible noise from these motors at nearly all locations outside the 40-dBA contour. Homes located between the 45- and 40-dBA contours may still be able to hear the mixer motors, but at a much reduced sound level from current values.

Summary

This report has identified and documented the major sources of environmental noise that are a part of the Willow Lake WWTP. This study has found that the plant is operating in compliance with DEQ noise standards during the day hours, but there is a relatively small area in the immediate vicinity of the plant that exceeds the DEQ standards at night.

The study has also revealed that compliance with DEQ noise standards does not mean that the plant noise is inaudible or necessarily acceptable by the community. In fact, on quiet evenings such as those during the canning season, noise from the plant (specifically from the aeration basin mixer motors) is audible nearly a mile away.

In order to reduce the noise impact into the community, noise mitigation is recommended for the aeration basin mixer motors. These motors are the dominant source of noise in the plant during the canning season. The recommended noise mitigation for these motors is to fabricate and install an acoustical enclosure around each individual motor/gear box assembly. The expected noise reduction from these enclosures is 9 dBA, which should result in a net noise reduction of approximately 5 dBA in the community surrounding the plant.

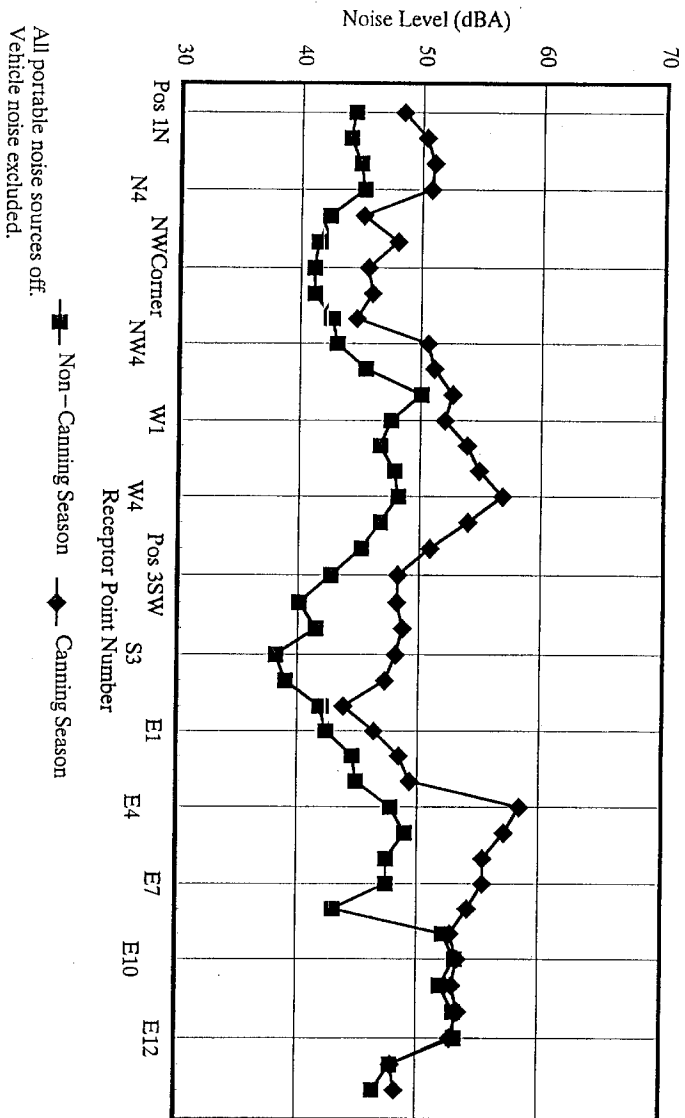


Figure 8-9

Plant Boundary Nighttime Noise Levels
Willow Lake Treatment Plant

found in Chapter 340, Oregon Administrative Rules (amended April 1983). These regulations limit allowable noise levels from commercial and industrial facilities to the noise standards indicated in Table 8-3.

Table 8-3 DEQ Environmental Noise Standards			
Daytime Hours		Nighttime Hours	
L(50)	55 dBA	L(50)	50 dBA
L(10)	60 dBA	L(10)	55 dBA
L(1)	75 dBA	L(1)	60 dBA
Note: Daytime hours are defined as 7 a.m. to 10 p.m. and nighttime hours are defined as 10 p.m. to 7 a.m.			

In addition to the A-weighted noise level standards shown in Table 8-3, the state noise standards may also limit the octave band sound levels from commercial and industrial noise sources. These standards are presented in Table 8-4. Note that the allowable octave band sound levels are to be measured in unweighted decibels (dB), not dBA.

The octave band noise standards are not routinely applied, but in special circumstances they can be applied at the discretion of the director of DEQ. The purpose of having octave band noise standards results from the fact that the A-weighted level of sound does not always correlate well with community acceptance (i.e., it is possible to have a situation where the A-weighted noise standards are met but a significant noise problem still exists). It is a well known fact that sounds that are impulsive (such as blasting or gun fire) or sounds with audible tonal components (such as some types of mechanical equipment) are more annoying than broad band sounds such as falling water. In fact, the DEQ standard requires noise sources with pure tone components to be at least 10 dB lower than the values shown in Table 8-4.

Table 8-4
DEQ Octave Band Noise Standards

Octave Band	Daytime Hours	Nighttime Hours
31 Hz	68 dB	65 dB
63 Hz	65 dB	61 dB
125 Hz	61 dB	56 dB
250 Hz	55 dB	50 dB
500 Hz	52 dB	46 dB
1000 Hz	49 dB	43 dB
2000 Hz	46 dB	40 dB
4000 Hz	43 dB	37 dB
8000 Hz	40 dB	34 dB

Note: Daytime hours are defined as 7 a.m. to 10 p.m. and nighttime hours are defined as 10 p.m. to 7 a.m.

The noise radiated by the aeration basin mixer motors does contain an audible pure tone component at 250 Hz, but the level of the tone is not sufficient to meet the definition of "pure tone" that is set forth in the DEQ standard. Therefore, a 250-Hz octave band noise level of 50 dB is adequate to satisfy DEQ requirements. It is obvious, comparing this criterion with the data presented in Table 8-2, that DEQ standards are met at all nine auxiliary measurement locations except locations E, F, and G on the plant entrance road.

Plant Noise Sources

Willow Lake WWTP contains a wide variety and large number of environmental noise sources. The entire plant was carefully surveyed during both the canning and non-canning seasons to examine each of these sources and to document the source characteristics of the most significant sources. The following paragraphs discuss those sources that were found to be a significant or potentially significant source to the community surrounding the plant.

Aeration Basins

There are 12 electric motors (ranging in size from 75 HP to 125 HP) mounted on top of the aeration basins at the south end of the existing plant. Eight of these motors are in continuous operation during the peak of canning season (approximately 1 month). The other four motors are back-up. During the rest of the canning season (approximately 3 months), only four of the 12 motors are operational. These motors are not used for the remainder of the year.

The mixer motors are directly exposed to the weather, and therefore are able to radiate a considerable amount of noise into the environment. The smaller motors are slightly noisier than the larger motors. The average noise level 10 feet from all motors is 84 dBA. The noise from the mixer motors is continuous and steady, and has a significant tonal component, making it particularly noticeable in comparison to other noise sources in the plant.

Oxygen Generation Facility

The oxygen generation facility contains two large compressors and a pressure swing absorption (PSA) skid along with other associated equipment. This facility operates only during the canning season. The average noise level inside the PSA skid room is 100 dBA, and the highest noise level was measured at 109 dBA. The noise level in the compressor room is somewhat less, averaging 90 dBA. These are extremely high sound levels, and even though these sources are located inside the building, a considerable amount of noise is radiated from the exterior rollup doors to these rooms. The average noise level 5 feet from the PSA skid rollup door is 79 dBA, and the average noise level from the compressor room door is 78 dBA at the same distance.

The other noise sources directly related to the oxygen generation building are the compressor air intakes at the south end of the building, the cooling tower, and the media blowdown vent on the roof. All of these noise sources are directly exposed to the environment, and all operate only during the canning season. The cooling tower is a significant source of noise with a level of 84 dBA at 10 feet. The two compressor intakes are equipped with filter silencers, but the noise level radiated from these two units still averages 79 dBA at 10 feet. The maximum noise level from the media blowdown vent silencer on top of the building is 76 dBA at 50 feet. This represents the highest single source sound level in the entire plant.

The compressor and cooling tower noise is continuous and steady, and does not contain any significant tonal components. The PSA skid noise level fluctuates significantly through a range of about 20 dBA every few minutes, but this variation is not abrupt and there are no tonal components to the noise. The noise radiated by the vent silencer on the roof also fluctuates much like the PSA skid. Although the media blowdown vent has the highest sound level of any one source in the plant, its character is extremely broad band, with no hint of tonal components.

Cogeneration Facility

The primary noise source in the cogeneration building is the digester gas engine that runs the electric generator. The other major noise source is the compressor, located in the same building but in a different room. The average noise level inside the generator room is 99 dBA. The average noise level inside the compressor room is 92 dBA.

Typically, the engine generator and compressor both run continuously throughout the year. The primary noise sources from this facility are the engine exhaust outlet above the roof, the rollup door on the east side of the building, the compressor room door (with ventilation

louvers), and the generator room ventilation air intake and exhaust louvers in the south and north walls, respectively.

The noise radiating from the engine exhaust outlet was measured at 57.2 dBA at a distance of 100 feet. This is equivalent to an A-weighted sound power level of 95 dBA. In addition, each of the two exhaust fan louvers on the north wall of the cogeneration building radiates a sound power level of 90 dBA. Each of these two openings contains a propeller fan to exhaust air from the generator room. The noise radiating from these two louvers is a combination of fan noise and engine noise. The intake louver on the south side of the building contains a silencer, so the radiated noise is considerably less than at the openings on the north side of the building. The other major noise source is the roll up door into the generator room. When the door is closed, the noise level is 72.6 dBA at a distance of 10 feet. The equivalent A-weighted sound power level radiating from the roll up door is 90 dBA with the door closed.

Blower Building

The blower building is located adjacent to the aeration basins near the south edge of the plant. The blowers do not operate during the canning season, but they operate continuously during the non-canning season. There are four blowers mounted inside the blower building, each having a separate intake pipe with a filter/silencer mounted at the intake opening above the roof of the building. The blower building contains numerous acoustical panels on the walls and on the underside of the roof deck to reduce the blower noise inside the building.

In addition to its aeration blowers, the building is equipped with four propeller exhaust fans mounted in the east wall to ventilate the blower room. Air enters the blower building through ventilation louvers (equipped with automatic dampers) in the west wall. The ventilation fans cycle on in stages as the temperature inside the blower building rises.

Noise is radiated from the blower building in several locations including:

- The blower intake filter/silencers on the roof
- The ventilation fan exhaust louvers in the east wall
- The ventilation intake air louvers in the west wall
- The roll up door in the south wall

The noise inside the blower building measured 83 dBA in the reverberant field with one blower in operation. The energy average noise level measured 3 feet from the blower was 90 dBA. If two blowers operate simultaneously, the reverberant field noise level inside the blower building would be 86 dBA. The noise level 5 feet from the filter/silencer intake on the blower building roof was 83 dBA. Each blower intake is located approximately 3 feet above the roof deck, and the intake filter/silencer has four horizontal openings spaced 90 degrees apart azimuthally with a rain hood style of cover for each opening. The result of this intake arrangement is that much of the sound is directed downward. This directionality

effect, plus the partial shielding effect of the blower building parapet, helps reduce the overall impact of the blower intake noise on the surrounding environment.

The greatest source of noise to the environment from the blower building are the exhaust fan openings in the east wall of the building and the intake louvers in the west wall. The measured noise level from each opening in the east wall is 85 dBA at a distance of 5 feet with the fan operating. This is equivalent to a sound power level of 97 dBA from each fan. If all four fans are operating (as they could on a warm day), the total sound power level would be 103 dBA. Although these openings allow blower noise to escape from the building without attenuation, most of the noise radiating from the east louvers is propeller fan noise.

The west wall louvers provide ventilation air intake, and they are considerably larger in area than the east wall louvers. These openings do not contain propeller fans, and the noise radiating from these louvers is primarily blower noise, not fan noise. The dampers on these louvers will stage open with the propeller fans on the east wall. The measured noise level at 25 feet with two louvers open was 64 dBA. This is equivalent to a total sound power level of 87 dBA.

Clarifiers and Trickling Filters

The noise radiated by the clarifiers and trickling filters is caused by falling water and is not very significant in comparison to the other mechanical sources in the plant. Although these sources are physically large, their overall impact to the noise radiated by the plant is minor.

Miscellaneous Pumps and Fans

There are several other sources of noise in the plant, but the only others worth mentioning here are some miscellaneous pumps located in various areas around the plant. These include the RAS pumps, the trickling filter pumps, the raw sewage pumps, and the gravity thickener pump. All of these pumps (or motors) are exposed to the environment except the raw sewage pumps located in the raw sewage pump station.

Moving and Portable Noise Sources

In addition to the permanent, fixed noise sources associated with the plant, there are also numerous moving and portable noise sources. For the most part, these include service and maintenance vehicles and equipment. Moving and portable noise sources that were measured during the September 1991 noise survey include sludge trucks, fork lifts, delivery trucks, and an engine powered portable sludge pump located adjacent to one of the sludge lagoons at the north end of the plant. Portable noise sources measured during the May 1992 noise survey included two ventilation fans serving the aeration basins during routine maintenance of this facility.

Note that the measured noise level of most of the noise generating equipment mentioned in the above paragraphs is given in dBA at a certain distance. Though the noise level generally decreases with distance from the source, in order to provide a simple means of comparing the overall level of each of the various groups of noise sources, the A-weighted sound power level of the most significant noise sources found in the plant was estimated. The sound power levels are not the same as the actual loudness of the noise at a given point, but are an accurate method of determining which noise sources are the most significant in terms of radiation into the environment.

Note in Table 8-5 that the eight aeration basin mixer motors generate the greatest sound power level of any of the groups of sources. This is partly because there are eight motors. The sound power level of each individual motor is approximately 102 dBA. It is also interesting to note that the sludge trucks are one of the highest individual noise sources in the plant, yet they are not a significant source of noise overall because they are intermittent, they are located close to the ground so they are partially shielded by buildings on the site, and, mainly, there is very little sludge truck activity during the night hours.

Table 8-5 Estimated Sound Power Levels of Primary Noise Sources		
Noise Source	Location	Sound Power Level (dBA)
Mixer Motors (8)	Aeration Basins	111
Sludge Truck (each)	Service Roadways	105
Media Blowdown Vent	Oxygen Building	105
Blower Building Fans (4)	Blower Building	103
Cooling Tower	Oxygen Building	102
Compressor Intakes (2)	Oxygen Building	97
Co-Gen Engine Exhaust	Co-Gen Building	95
Co-Gen Vent. Fans (each)	Co-Gen Building	92
PSA Rollup Door	Oxygen Building	91
S. Primary Effluent Pump	S.P.E. Pump Station	91
Compressor Rollup Door	Oxygen Building	90
Co-Gen Rollup Door	Co-Gen Building	90

Noise Modeling via Computer

The noise source level and frequency data collected on each individual source was input into a computer noise model of the Willow Lake WWTP. The purpose of modelling the noise sources in the plant is to enable the evaluation of plant noise in the community under a variety of conditions. Once the model is set up and calibrated with actual noise measurements, it is a relatively simple matter to make modifications to various noise sources and to

determine the expected impact on the environment. This is the most efficient means of evaluating cost-effective noise control measures.

Description of the Model

The Willow Lake WWTP noise model is a three-dimensional model of the existing plant as it was operating during the September 1991 noise survey. Fifty-two fixed noise sources are currently identified in the model, although not all sources operate in both the canning and non-canning seasons. The sources are defined by their effective source location coordinates, source level at a given distance in each of the eight primary octave bands, plus various other attributes such as crest factor, idle adjustment, and percentage of the time the equipment is operational.

The model calculates the sound propagation losses from each source to each receiver independently, then sums the contribution from all sources at each receiver to get the total sound level from the plant. The model takes into consideration various environmental factors such as temperature, wind speed and direction, and humidity. The model also evaluates the attenuation effects of acoustical shielding if there are any buildings or topographical features between a given source and receiver.

Calibration of the Model

The Willow Lake WWTP noise model has been calibrated to actual noise measurements during the canning season at each of the four 24-hour noise monitoring positions shown in Figure 8-1. Additionally, the model output has been compared to actual noise measurements at various locations within the plant boundaries during the non-canning season. Table 8-6 presents a summary of the model's predictions along with the measured average noise levels at each location.

Table 8-6 Model Calibration Summary		
Location	Model Prediction	Measured Level
Canning Season		
11N	49.5 dBA	48 dBA
2S	47.8 dBA	50 dBA
3SW	49.8 dBA	53 dBA
4E	43.2 dBA	45 dBA
Non-Canning Season		
1N	46.8 dBA	44 dBA
2S	40.6 dBA	43 dBA
3SW	43.3 dBA	44 dBA

With the exception of Location 1N, the model predictions are approximately 1 to 3 dBA lower than the measured values. This is to be expected since the model considers only noise sources from within the plant boundaries. The measured noise levels also include the ambient noise in the community (birds, wind blowing through the trees, local street traffic, and distant traffic from I-5 to the east). If the entire plant could be turned off, it would be possible to measure the non-plant ambient and subtract it from the measured values to get a direct comparison of the model prediction. Of course this is not practical, and not necessary. The model predictions are exactly in line with expectations for these conditions.

Noise Model Predictions

Figures 8-8A, 8-8B, and 8-8C present the projected daytime and nighttime noise level contours for both the canning and non-canning seasons. These contours were determined from the output of the computer noise model. The following assumptions were made in the computer model study to examine the worst case scenario:

- All noise sources operate 100 percent of the time (day and night) except the following:
 - Portable equipment (ventilation fans and sludge pumps) does not operate at night.
 - All service and maintenance vehicles (including sludge trucks) do not operate at night.
 - The cooling tower, aeration basin mixer motors, oxygen generation building, and the south primary effluent pump station do not operate during the non-canning season.
 - The blower building does not operate during canning season.
- Four sludge trucks enter and leave the site every hour (day hours only).
- Four 1-ton delivery and service trucks enter and leave the site every hour (day hours only).
- Every hour a fork truck circles the interior roadways of the site four times (day hours only).

The noise contours in Figure 8-8A clearly show that the canning season noise meets the DEQ 55-dBA daytime standard, but the DEQ 50 dBA nighttime standard is exceeded over a relatively small area outside the plant boundaries. The 40- and 45-dBA noise contours encompass a much larger area, and although the plant is in compliance with DEQ noise standards, noise from the aeration basin mixer motors is oftentimes clearly audible inside the 40-dBA contour. This is particularly true during the night hours when street traffic

noise is low. The character of the noise from the aeration basin mixer motors is such that it does not blend in with the other ambient noises in the community. Consequently, all areas within the 40-dBA noise contour are potentially impacted by noise from the plant.

During the non-canning season (see Figures 8-8B and 8-8C), the 50-dBA contour extends beyond the plant boundaries only near the west entrance and a small area north of the sludge lagoons (during the daytime hours). The character of the noise radiating from the plant during the non-canning season is similar to the character of the existing ambient noise. There are no major noise sources that are intermittent or that contain audible pure tones. Because the ambient noise level in the surrounding community (from noise sources unrelated to the plant) drops to approximately 40 dBA during the night, the nighttime plant noise should not be greater than 45-dBA to avoid an impact. Consequently, there should be little or no concern about plant generated noise in areas beyond the 45-dBA contour during the non-canning season.

The noise model has also been used to compute and present the plant noise levels at various locations along the plant boundaries. Figure 8-9 shows the predicted property line nighttime noise levels for the canning and non-canning seasons as one moves counter-clockwise around the plant boundary starting at Position 1N (the northeast corner). Several of the receptor point numbers (W1, E4, etc.) are shown in Figure 8-1 for easy reference. The noisiest area during the canning season are points W4 and E4 because they are close to the oxygen generation facility and the aeration basins. During the non-canning season, the noisiest area is near the plant entrance because of the cogeneration building. In general, the quietest areas are the northwest corner and the south property line because they are several hundred feet from the nearest plant equipment.

Noise Mitigation

A detailed analysis of the noise model output has revealed that the aeration basin mixer motors are the only noise sources in the plant that warrant noise mitigation as far as community impact is concerned. All other noise sources generate a type of noise that blends into the existing ambient, and the noise levels are in compliance with DEQ regulations. The aeration basin mixer motors, however, totally dominate the noise radiation from the plant in virtually all directions. Not only is the level greatest from these units, but the tonal character of the noise would make them noticeable to the residents in the area.

One approach to controlling mixer motor noise is to surround each unit with an acoustical enclosure similar to that shown in Figure 8-10. A majority of the noise radiating from the motor/gear box is absorbed by the enclosure before it escapes out the top opening. This general approach is currently being implemented in wastewater treatment plants located in both Seattle and Bellingham, Washington. The approximate noise reduction that can be achieved from these partial enclosures is 9 dBA in the vicinity of the aeration basin. This would not yield a full 9-dBA noise reduction in the surrounding community because of the additive effects of other noise sources inside and outside the plant boundaries. However, it

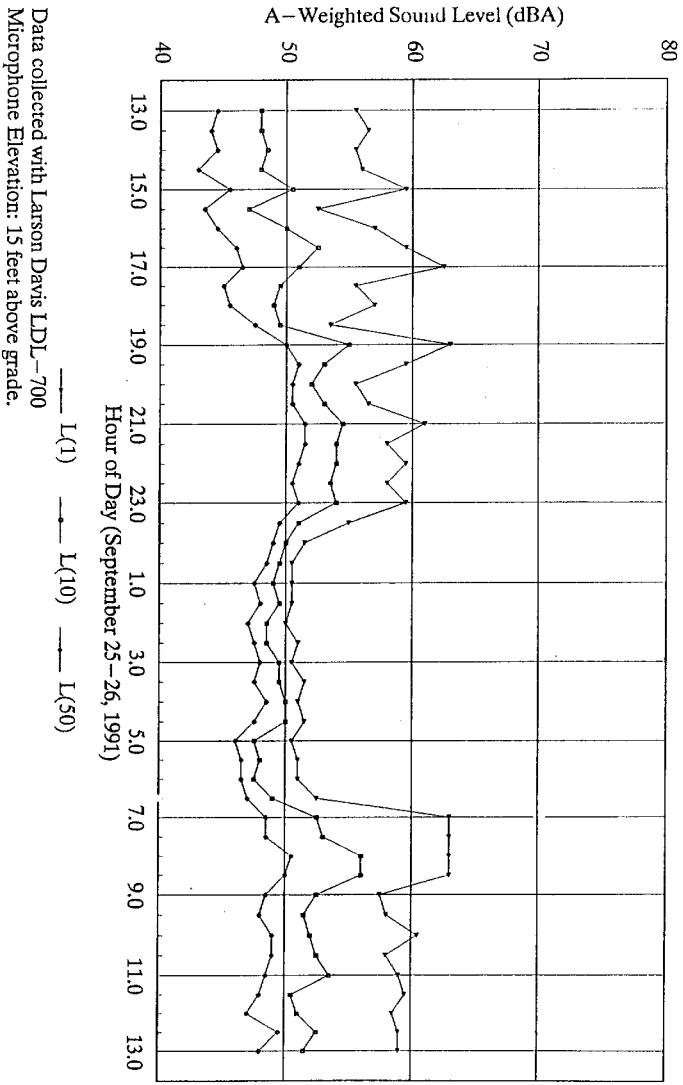


Figure 8-2
Ambient Noise at Position 1N (Ldn = 56.2 dB)
 Willow Lake Treatment Plant

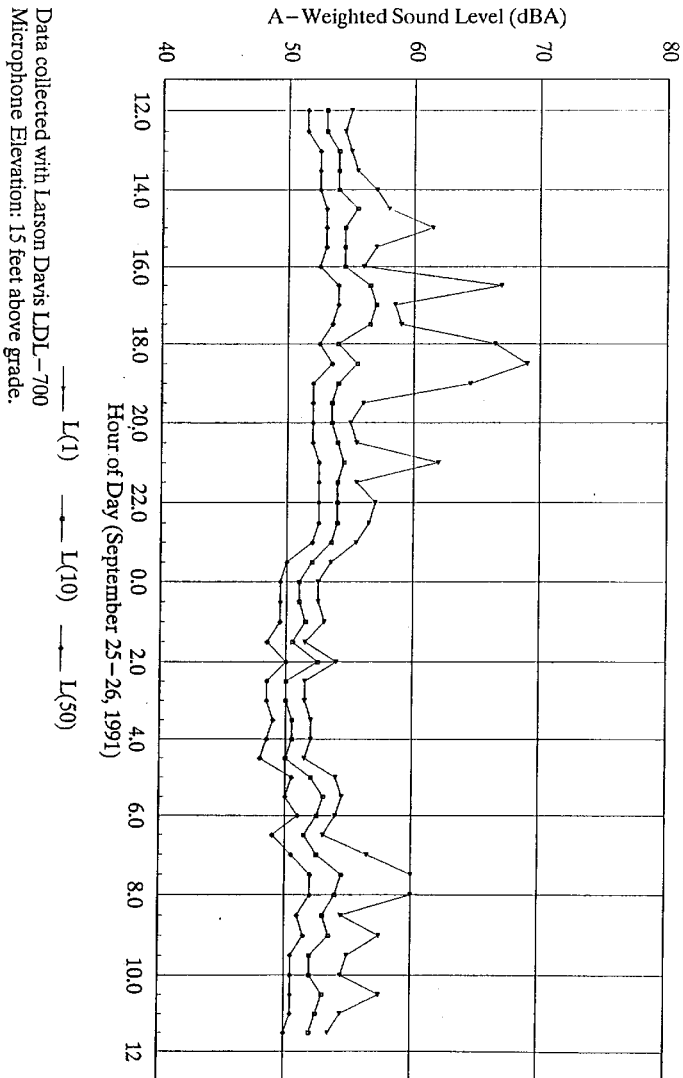


Figure 8-3
Ambient Noise at Position 2S (Ldn = 57.4 dB)
 Willow Lake Treatment Plant

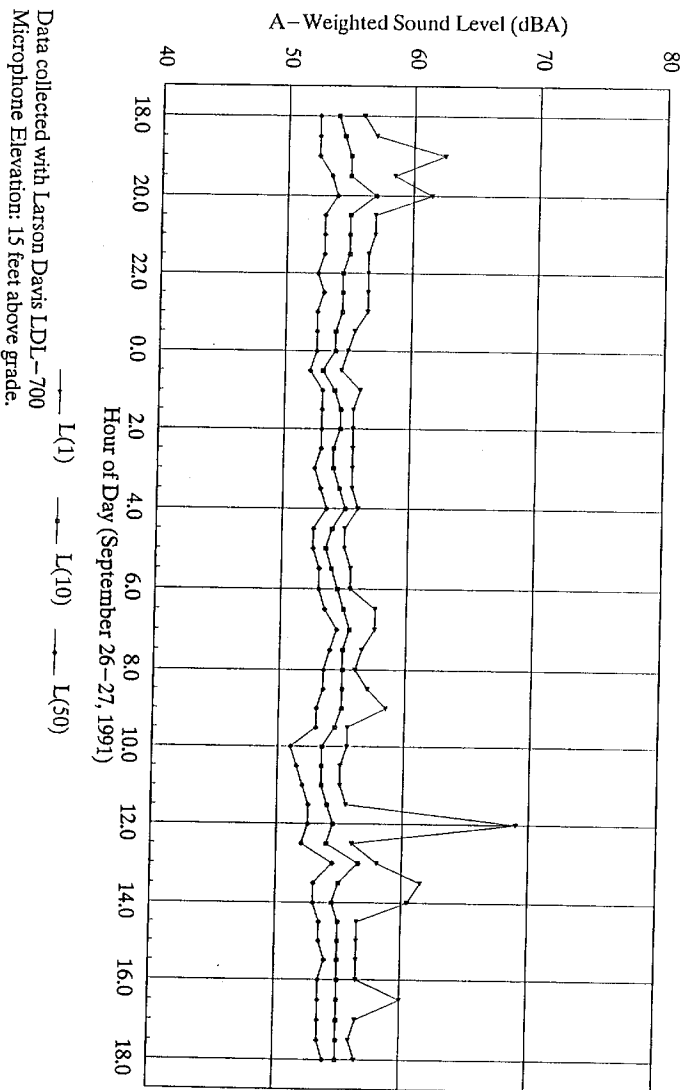


Figure 8-4

Ambient Noise at Position 3SW (Ldn = 59.4 dB)

Willow Lake Treatment Plant

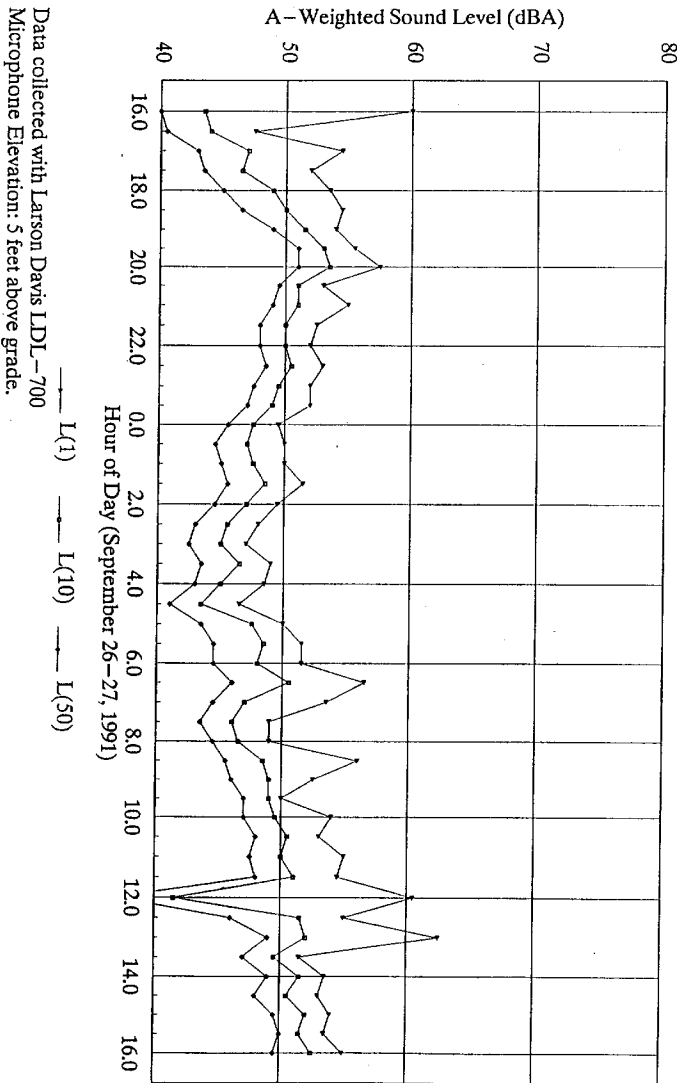


Figure 8-5
Ambient Noise at Position 4E ($L_{dn} = 52.9$ dB)
 Willow Lake Treatment Plant

octave band is the primary frequency band of noise radiated by the mixer motors mounted on top of the aeration basins. These motors were clearly audible or barely audible at all of the nine auxiliary measurement locations.

Table 8-2
Auxiliary Noise Measurements

Location	SPL (dBA)	250 Hz ^a	Comments
A	42	49 dB	Aeration Basins Audible
B	43	46 dB	Aeration Basins Audible
C	43	47 dB	Aeration Basins Audible
D	50	47 dB	Plant Clearly Audible
E	52	52 dB	Plant Clearly Audible
F	53	53 dB	Plant Clearly Audible
G	52	52 dB	Aeration Basins Audible
H	39	37 dB	Aeration Basins Audible
I	37	36 dB	

^aSound pressure level in 250-Hz octave band.

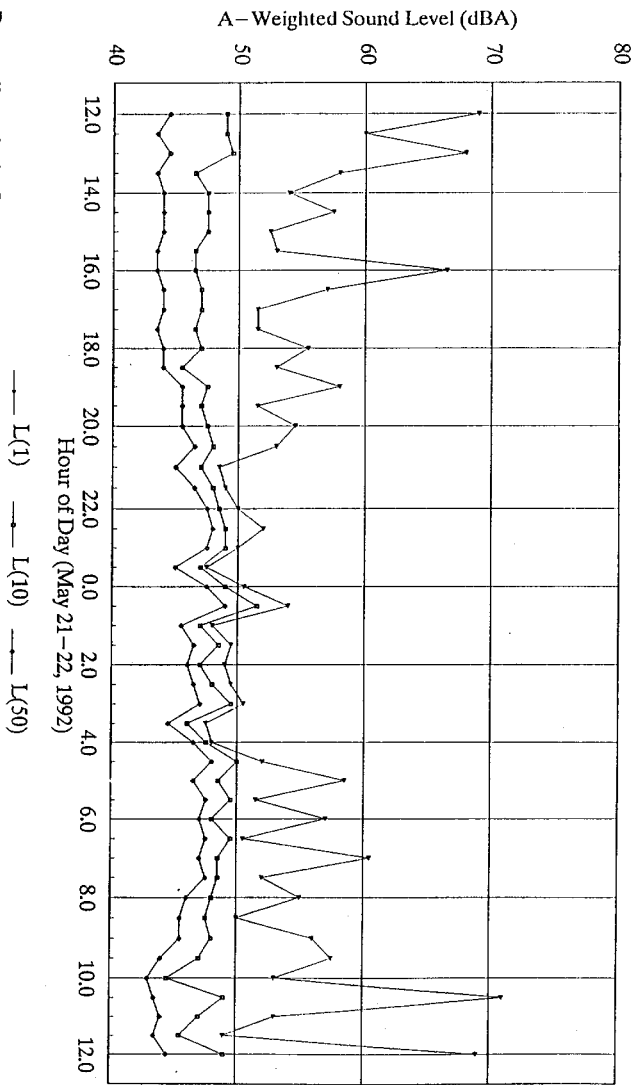
Non-Canning Season

The 24-hour noise measurements were repeated at Position 2S using the same equipment during the non-canning season measurements in May 1992. The results of these measurements are shown in Figure 8-6. Although there are six measurement periods where the L(1) level is above 60 dBA, these are all caused by events other than plant operation. In fact, the number of L(1) events above 60 dBA during the non-canning season measurements is exactly the same as for the canning season measurements.

The big difference between the canning and non-canning season noise levels at Position 2S is the L(50) statistic. The L(50) is strongly influenced (if not entirely controlled by) noise from the plant. Figure 8-7 presents a direct comparison between the L(50) statistic at Position 2S for the canning and non-canning season. Note that the canning season is between 5 and 10 dBA noisier than the non-canning season during most of the day.

Noise Standards

The L(1), L(10), and L(50) statistical levels are displayed in Figures 8-2 through 8-7 to show the range of variation in the sound level as a function of time of day. These particular statistics were selected because they coincide with the DEQ noise control regulations



Data collected with Larson Davis LDL-700
 Microphone Elevation: 15 feet above grade.

Figure 8-6
Ambient Noise at Position 2S (Ldn = 54.1 dB)
 Willow Lake Treatment Plant

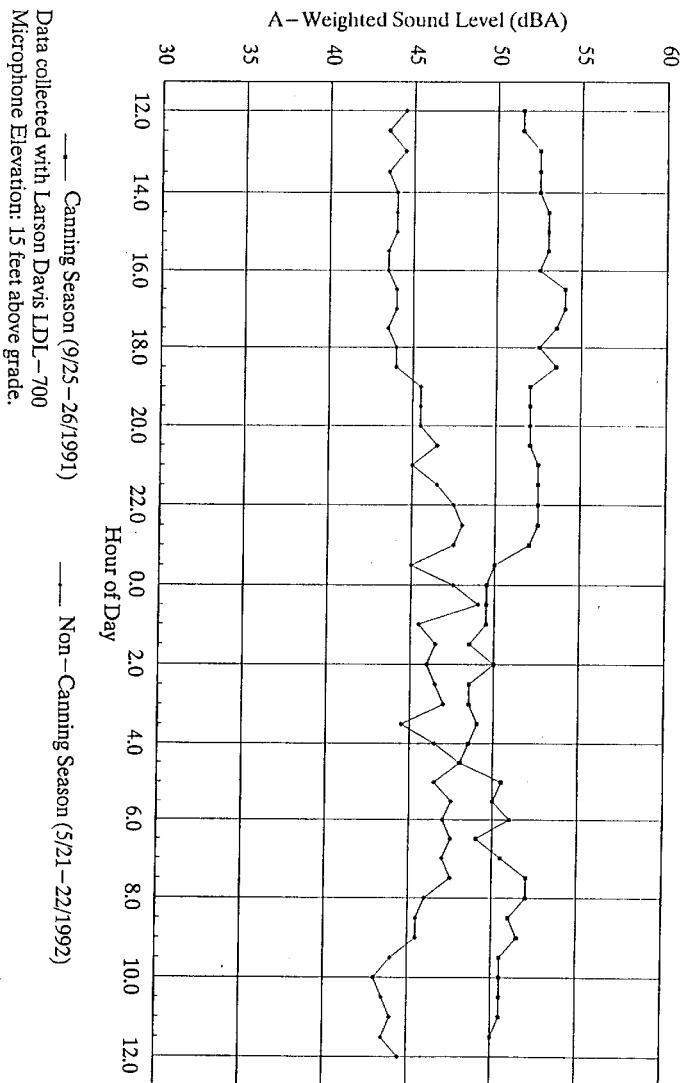


Figure 8-7

Ambient Noise at Position 2S (L50)
Willow Lake Treatment Plant

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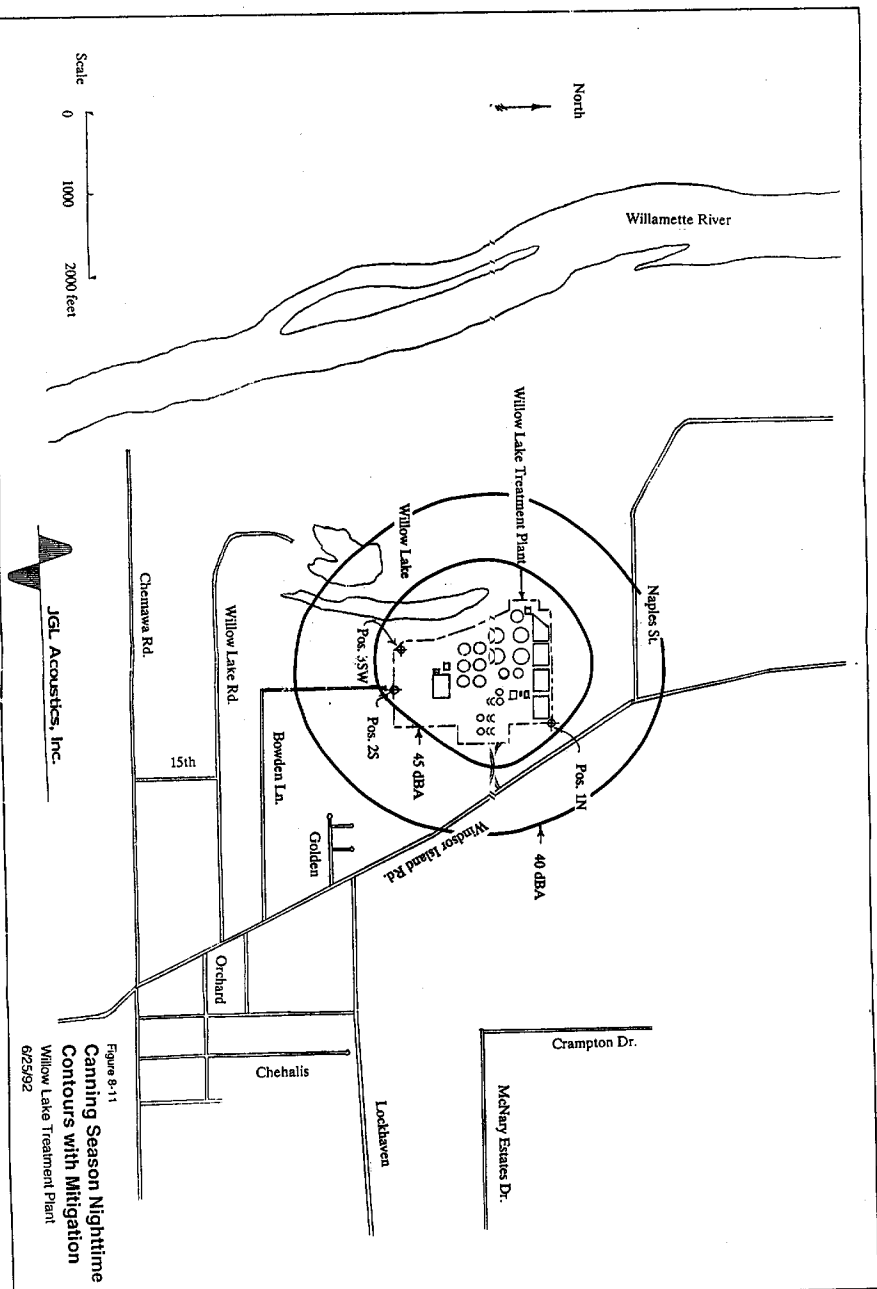
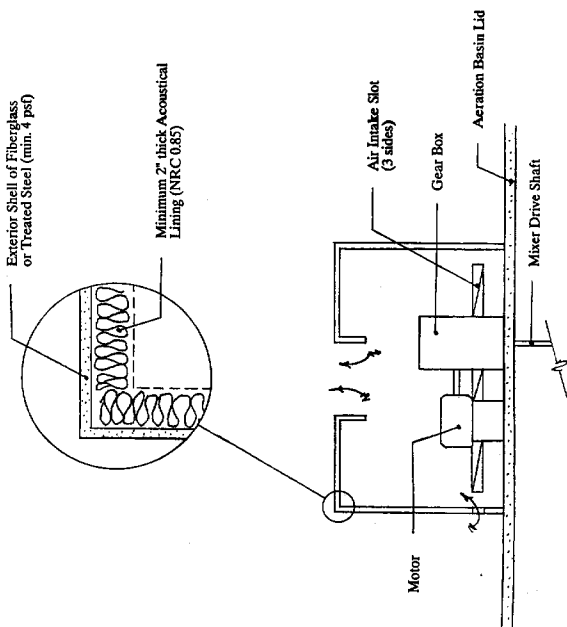
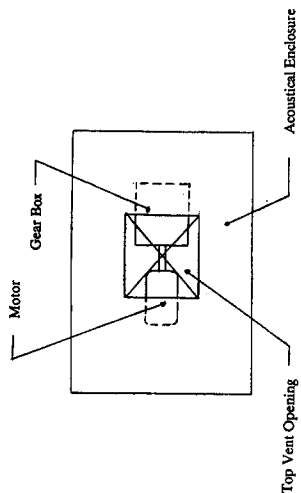


Figure 8-11
 Canning Season Nighttime
 Contours with Mitigation
 Willow Lake Treatment Plant
 6/25/92



SECTION VIEW (not to scale)

North



PLAN VIEW (not to scale)



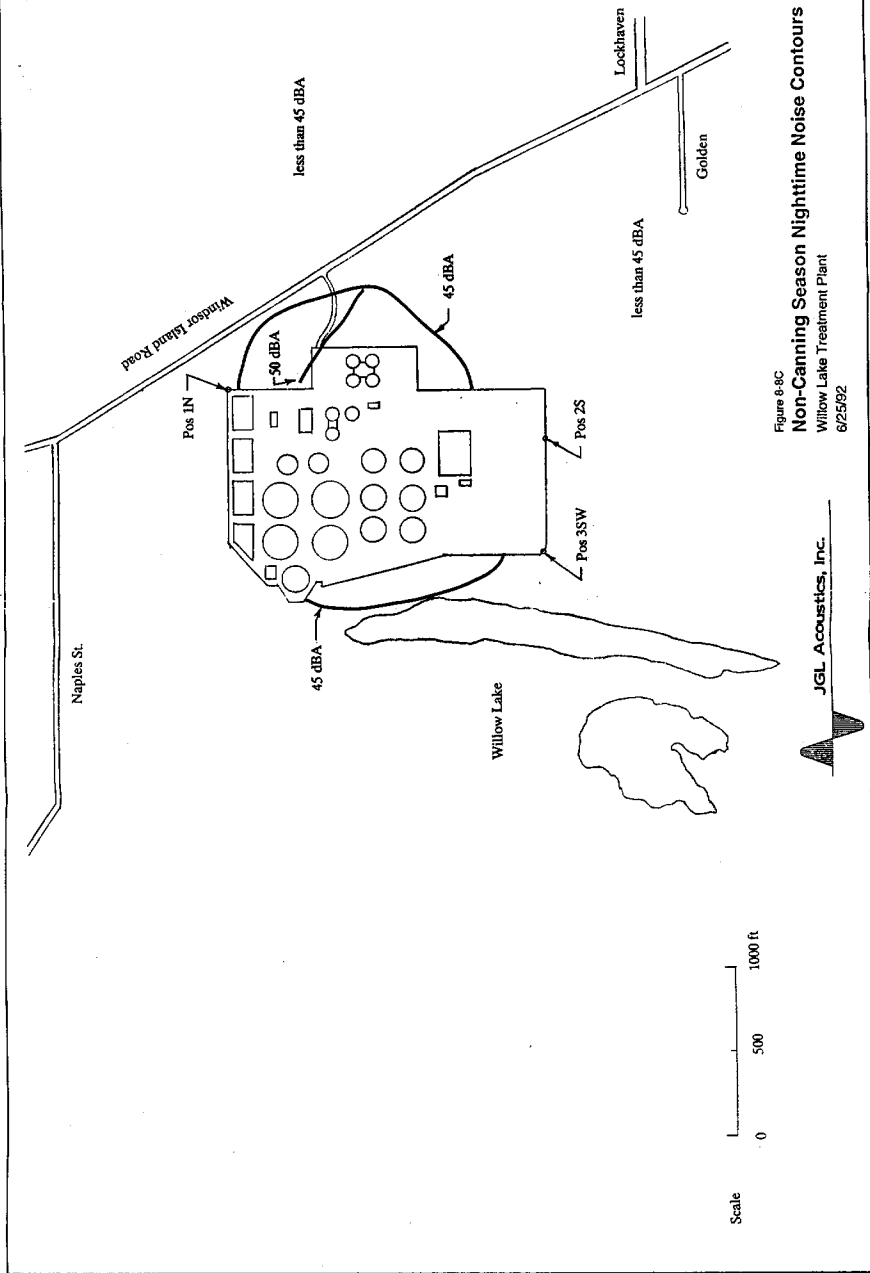
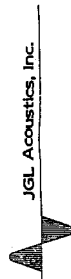


Figure 6-8C

Non-Canning Season Nighttime Noise Contours

Willow Lake Treatment Plant

6/25/92



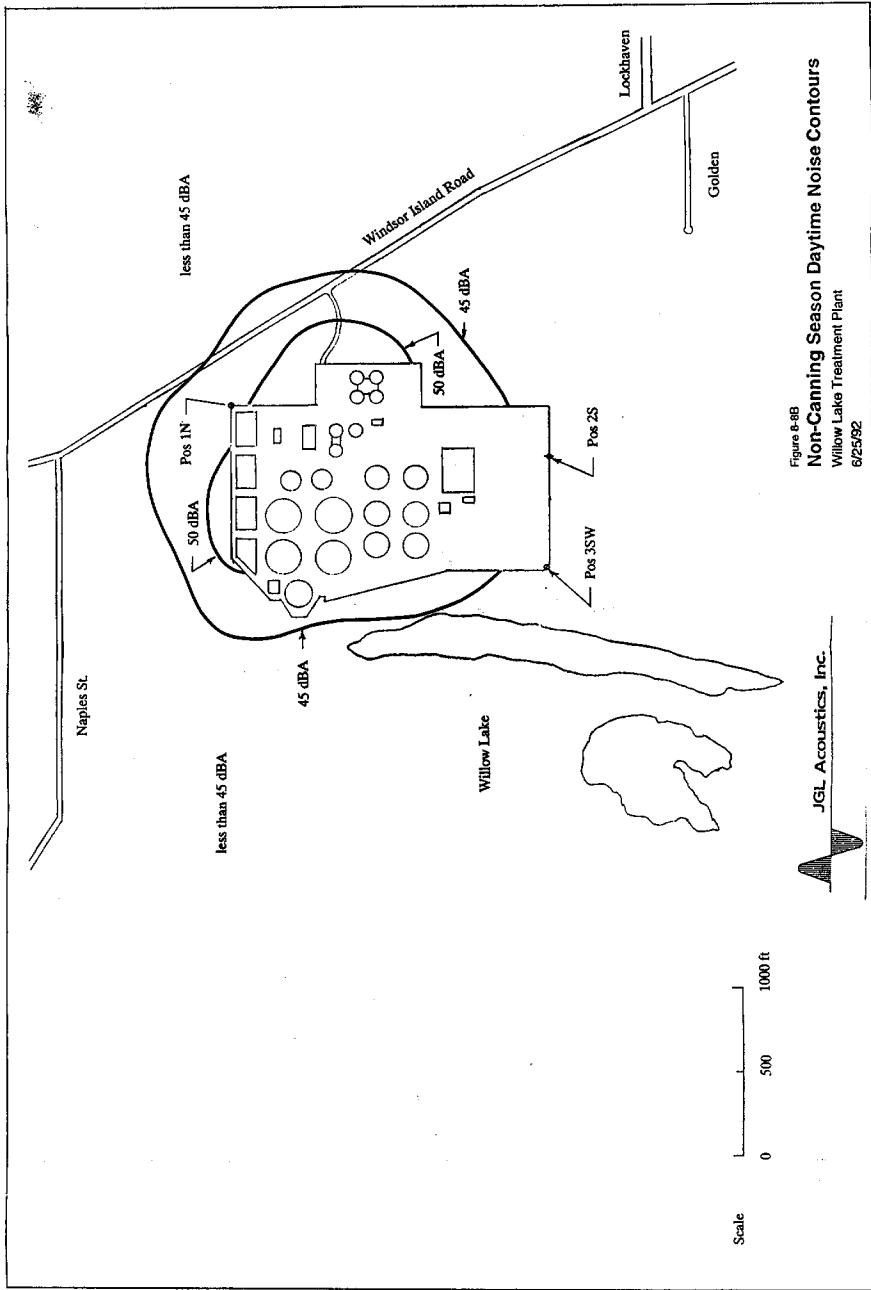
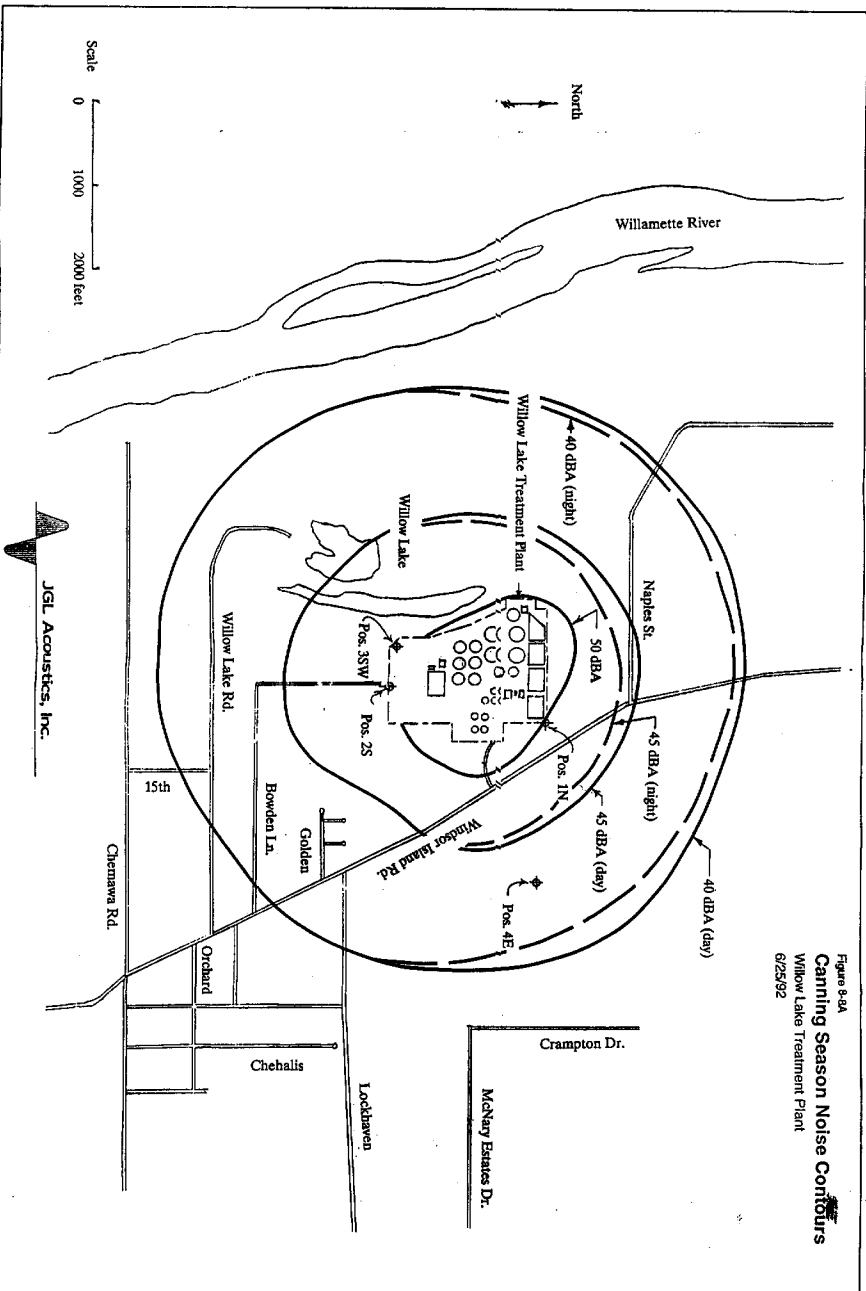


Figure 8-3A
Canning Season Noise Contours
 Willow Lake Treatment Plant
 6/25/92



JGL Acoustics, Inc.

Figure 8-1
Site Plan and Noise Measurement Locations
 Willow Lake Treatment Plant
 6/25/92

