

RESOLUTION NO. 1770

**A RESOLUTION OF THE GOLDEN CITY COUNCIL  
APPROVING AN INTERGOVERNMENTAL AGREEMENT  
BETWEEN THE CITY OF GOLDEN AND THE JEFFERSON  
COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT  
FOR THE 2007 MOSQUITO MANAGEMENT PROGRAM**

WHEREAS, the City of Golden's Home Rule Charter authorizes the City to enter into intergovernmental agreements for the provision of municipal services; and

WHEREAS, the Jefferson County Department of Health and Environment has contracted with Otter Tail Environmental, Inc. to implement an integrated mosquito management program which will combat the threat of mosquito-borne transmission of West Nile Virus and other arboviral diseases within Jefferson County; and


WHEREAS, the Jefferson County Department of Health and Environment shall, upon the receipt of the IGA and payment of the service fee to Jefferson County, perform mosquito control management for designated areas within the City; and

WHEREAS, City Council finds such agreement beneficial to the public health, safety and welfare.


THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GOLDEN, COLORADO:

The intergovernmental agreement between the City of Golden and the Jefferson County Department of Health and Environment for a cooperative mosquito management program for 2007, in substantially the form as attached as Exhibit A is approved. The Mayor is authorized to execute the agreement on behalf of the City.

Adopted on the 24th day of May, 2007.

  
\_\_\_\_\_  
Charles J. Baroch  
Mayor

ATTEST:

  
\_\_\_\_\_  
Susan M. Brooks, MMC  
City Clerk

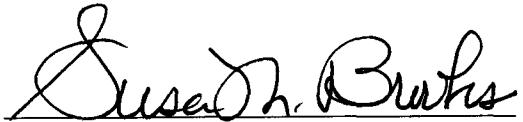
APPROVED AS TO FORM:

  
James A. Windholz  
City Attorney

I, Susan M. Brooks, City Clerk of the City of Golden, Colorado, do hereby certify that the foregoing is a true copy of a certain Resolution adopted by the City Council of the City of Golden, Colorado at a rescheduled regular meeting thereof held on the 24th day of May, A.D., 2007.

(SEAL)

ATTEST:

  
Susan M. Brooks, City Clerk of the City of  
Golden, Colorado

**INTERGOVERNMENTAL AGREEMENT FOR COOPERATIVE  
MOSQUITO MANAGEMENT PROGRAM**

**THIS INTERGOVERNMENTAL AGREEMENT** is made and entered into and effective as of the \_\_\_\_ day of \_\_\_\_\_, 2007, between the **JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**, whose address is 1801 19<sup>th</sup> Street, Golden, CO 80401, hereinafter referred to as the "Health Department"; and the **CITY OF GOLDEN**, a municipal corporation of the State of Colorado, with its principal office located at 911 10<sup>th</sup> Street, Golden, CO, hereinafter referred to as "Golden."

**WITNESSETH:**

**WHEREAS**, the objective of public health mosquito control is to prevent the mosquito-borne transmission of diseases to humans, livestock, and domestic pets, and in order to effectively deal with the continuing threat of mosquito-borne transmission of West Nile Virus and other arboviral diseases, the Health Department has contracted with OtterTail Environmental, Inc., ("OtterTail") for Integrated Mosquito Management ("IMM") services within certain areas of Jefferson County, Colorado, during the year 2007; these services shall be provided to Jefferson County and various municipalities within Jefferson County at a cost per square mile basis, and

**WHEREAS**, said IMM services are detailed in a document entitled PURCHASE OF SERVICES AGREEMENT, signed April 17, 2007, which includes the scope of work, the service area map, the mosquito surveillance plan, the sentinel zone protocols, and a copy of the signed confidentiality statement; a copy of which is attached hereto and incorporated herein as **Attachment A**, and

**WHEREAS**, for a price to be paid to OtterTail by Golden through payment to the Health Department, OtterTail, through the direction of the Health Department, will perform the IMM services as detailed in **Attachment A** for an area of approximately 9.3 square miles located within the boundaries of Golden; and

**WHEREAS**, the parties now desire to enter into this Intergovernmental Agreement so as to memorialize their agreement with respect to their respective responsibilities regarding the provision of such IMM services within Golden's boundaries.

**NOW, THEREFORE**, in consideration of the mutual promises and covenants contained herein, the parties hereto agree as follows:

1. **PROVISION OF IMM SERVICES WITHIN GOLDEN:** Upon the signing of this Intergovernmental Agreement by the parties hereto, the Health Department will direct OtterTail, during the year 2007, to perform the IMM services set forth in **Attachment A** for an area of approximately 9.3 square miles located within the boundary of Golden. The services and service fee do not include adulticide services. The Health Department will monitor the need for adulticiding and will advise the County and all participating municipalities if an adulticide program is recommended and approved by the Board of Health and Board of County Commissioners.

2. **PROVISION OF OTHER IMM SERVICES BY GOLDEN:** Golden shall designate a point of contact for communication with the Health Department; provide public education to their citizens; refer citizen complaints to OtterTail; coordinate with the Health Department on IMM services or concerns; and advise the Health Department, by report, of the IMM services, if any, conducted or directed by Golden. The IMM service reports shall be submitted on a monthly basis on or before the 5th of the month effective July 2007 and ending October 2007. The monthly IMM service report, with the notation "re: West Nile IGA Report", shall be sent to Jefferson County Department of Health and Environment, 1801 19th Street, Golden Colorado 80401.
3. **MONITORING THE PROVISION OF IMM SERVICES:** Staff from the Health Department will monitor the work of OtterTail and Golden to ensure that the IMM services detailed in Paragraph 1 and 2 above are fulfilled. The Health Department will be responsible for coordinating between OtterTail and Golden for the delivery of IMM services detailed in **Attachment A**. As needed, the Health Department will provide Golden with public education information and periodic reports regarding the status of mosquito-borne diseases and vector control. Questions regarding the Health Department's IMM services shall be through Dr. James Dale, Jefferson County Department of Health and Environment, 1801 19th Street, Golden, Colorado, 80401; PHONE: 303-271- 5718; FAX: 303-271-5702; EMAIL: [jdale@jeffco.us](mailto:jdale@jeffco.us).
4. **PAYMENT OF GOLDEN IMM SERVICE FEE:** Golden agrees to pay to the Health Department six thousand four hundred sixty three and 50/100 dollars (6,463.50) which is equal to 50 percent of the total Golden IMM service fee of twelve thousand nine hundred twenty seven dollars (\$12,927.00) to reimburse the Health Department for Golden's share of the IMM services performed by OtterTail. After execution of this Intergovernmental Agreement by the last party, Golden shall pay the Health Department in three equal payments of two thousand one hundred fifty four and 50/100 dollars (\$2,154.50) in response to July, August and September invoices from the Health Department. The payment, with a notation "re: West Nile IGA", shall be sent to Jefferson County Department of Health and Environment, 1801 19<sup>th</sup> Street, Golden Colorado 80401.
5. **PAYMENT OF UNINCORPORATED JEFFERSON COUNTY IMM SERVICE FEE:** The Health Department will pay for and direct OtterTail to perform the IMM services as set forth in **Attachment A** located within unincorporated Jefferson County.
6. **TERM:** The term of this Intergovernmental Agreement shall be from the date of signature by the last party hereunder to and until December 31, 2007.
7. **LIABILITY INSURANCE COVERAGE/INDEMNITY/WARRANTY:** As described in Paragraphs 5 and 6 of the PURCHASE OF SERVICES AGREEMENT, OtterTail shall maintain liability insurance coverage and will hereby indemnify and hold the Health Department and Golden harmless from all claims, damages, loss, injury, cost and expense, including attorneys' fees resulting from or related to any negligent or intentional acts or omissions of OtterTail, its agents, employees, subcontractors and consultants, in its performance of the agreement. A copy of OtterTail's Certificate of Liability Insurance is provided as **Attachment B**.
8. **NO GUARANTEE BY THE HEALTH DEPARTMENT:** Golden acknowledges that although the objective of the IMM services to be performed within Golden's boundaries by OtterTail is to

reduce the mosquito population and the consequent threat of transmission of West Nile Virus, the Health Department makes no guarantee as to the effectiveness of such IMM services in achieving such objective.

9. **ENTIRE AGREEMENT:** This writing constitutes the entire Intergovernmental Agreement between the parties hereto with respect to the subject matter herein, and shall be binding upon said parties, their officers, employees, agents and assigns and shall inure to the benefit of the respective survivors, heirs, personal representatives, successors and assigns of said parties.
10. **NO WAIVER OF IMMUNITY:** No portion of this Intergovernmental Agreement shall be deemed to constitute a waiver of any immunities the parties or their officers or employees may possess, nor shall any portion of this Intergovernmental Agreement be deemed to have created a duty of care which did not previously exist with respect to any person not a party to this Intergovernmental Agreement.
11. **NO THIRD PARTY BENEFICIARY ENFORCEMENT:** It is expressly understood and agreed that the enforcement of the terms and conditions of this Intergovernmental Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to the undersigned parties and nothing in this Intergovernmental Agreement shall give or allow any claim or right of action whatsoever by any other person not included in this Intergovernmental Agreement. It is the express intention of the undersigned parties that any entity other than the undersigned parties receiving services or benefits under this Intergovernmental Agreement shall be an incidental beneficiary only.

Signed by the parties' the \_\_\_\_\_ day of \_\_\_\_\_, 2007.

Jefferson County Department of Health and Environment

By: \_\_\_\_\_ By: \_\_\_\_\_  
Secretary to the Board of Health President Board of Health

ATTEST: CITY OF GOLDEN, a municipal corporation of the STATE OF COLORADO

By: \_\_\_\_\_ By: \_\_\_\_\_  
City/Town Clerk Mayor

APPROVED AS TO FORM:

By: \_\_\_\_\_  
City Attorney

# **Attachment A**

## PURCHASE OF SERVICES AGREEMENT

THIS AGREEMENT, dated for reference purposes only the 30th day of March, 2007, is made and entered into by and between the **Jefferson County Department of Health and Environment (JCDHE)**, 1801 19<sup>th</sup> Street, Golden, CO 80401, hereinafter referred to as "JCDHE", and **OtterTail Environmental, Inc.**, 1045 N. Ford Street, Golden, CO 80401, hereinafter referred to as "Contractor."

### WITNESSETH

WHEREAS, JCDHE is interested in contracting with a professional to provide public health integrated mosquito management services for the purpose of preventing and controlling mosquito-borne diseases such as West Nile Virus and West Equine Encephalomyelitis; and

WHEREAS, the Contractor desires to provide those services to JCDHE,

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, the parties hereto covenant and agree as follows:

#### 1. TERM

This Agreement shall be in effect for the period April 17, 2007 through December 31, 2007.

#### 2. RESPONSIBILITIES

These are defined in the Integrated Mosquito Management Program, Jefferson County, Colorado, Scope of Work, General Description and Specifications (Eight pages plus Attachments A,B, and C) that are attached as Exhibit A.

#### 3. COMPENSATION AND PAYMENT

- a. JCDHE will reimburse the Contractor a total of \$213,226 in 5 equal monthly payments starting in June, 2006. Contractor services will be documented and approved prior to authorization for payment. The final or fifth payment will be made after the completion and approval of all contract requirements.
- b. Contractor shall submit a monthly invoice to JCDHE by the 5<sup>th</sup> of the following month of service. Failure to submit billing information in a timely manner and correct format shall result in non-payment of invoice.
- c. Contractor shall be reimbursed within fourteen (14) days after receipt and approval of the invoice.

#### 4. CONFIDENTIALITY

- a. In performing services under the terms and conditions of this Agreement, Contractor agrees to comply with all JCDHE confidentiality requirements. Contractor must sign and return the Statement of Confidentiality, attached as Exhibit B, with the Purchase of Services Agreement.

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5. INDEPENDENT CONTRACTOR STATUS, PAYMENT OF TAXES AND INSURANCE COVERAGE

- a. In performing services under this Agreement the Contractor is acting as an independent contractor and not as an agent or employee of JCDHE.
- b. As an independent contractor, the Contractor is solely liable and responsible for maintaining worker's compensation insurance which complies with statutory requirements in the State of Colorado, unemployment insurance benefits, and the withholding and payment of any and all federal, state and local taxes applicable to the receipt of funds or other consideration by the Contractor under the terms of this Agreement.

6. INDEMNIFICATION

- a. Contractor hereby indemnifies and holds JCDHE and the municipalities in Jefferson County harmless from all claims, damages, loss, injury, cost and expense, including attorneys' fees resulting from or related to any negligent or intentional acts or omissions of the Contractor, its agents, employees, subcontractors and consultants, in its performance of this Agreement. This provision shall survive the termination of this Agreement.

7. INSURANCE

- a. In performing services under this Agreement, the Contractor shall submit a certificate of insurance to JCDHE establishing the Contractor has professional liability insurance provided by an insurance carrier licensed to do business in the State of Colorado and meets or exceeds JCDHE minimum insurance requirements.

8. NON ASSIGNMENT

- a. Neither this Agreement nor any interest therein, or any claim thereunder, shall be assigned by the Contractor to any third person without the prior written consent of JCDHE.

9. OFFICIALS NOT TO BENEFIT

- a. No elected or employed member of JCDHE shall directly or indirectly receive or be paid any share or part of this Agreement or any benefit that may arise thereof. The Contractor warrants that it has not retained any company or person (other than a bona fide employee working solely for the Contractor) to solicit or secure this Agreement, and that the Contractor has not paid or agreed to pay to any company or person, (other than a bona fide employee working for the Contractor), any fee, commission, percentage, brokerage fee, gift or any other consideration contingent upon or resulting from the award of this Agreement to the Contractor. Upon learning of any breach or violation of this provision, JCDHE shall have the right to terminate this Agreement with no further liability or obligation for payment.



10. EMPLOYMENT OPPORTUNITY USE OF COLORADO LABOR, ILLEGAL ALIENS

- a. The Contractor shall not refuse to hire, discharge, promote, demote or discriminate in matters of compensation against any person otherwise qualified, solely because of race, creed, sex, color, national origin or ancestry, disability or age. The Contractor shall not knowingly employ unauthorized aliens to perform any portion of the Agreement and shall comply with the provisions of the Immigration Reform and Control Act of 1986.

11. NON-APPROPRIATION

- a. The payment of JCDHE's obligations hereunder in the fiscal years subsequent to the Agreement period are contingent upon funds for this Agreement being appropriated and budgeted. If funds for this Agreement are not appropriated and budgeted in any year subsequent to the fiscal year of the execution of this Agreement, this Agreement shall terminate. JCDHE's fiscal year is the calendar year.

12. STATUTES, REGULATIONS AND ORDINANCES

- a. The Contractor shall observe and comply with federal, state and local laws, regulations, rules or ordinances that affect those employed or engaged by it, the materials or equipment used or the performance of the project and shall procure any and all necessary approvals, licenses and permits all at its own expense.

13. SEVERABILITY

- a. If any provision of this Agreement or the application thereof to any person or in any circumstance shall be unenforceable to any extent, the remainder of this Agreement and the application of such provision to other persons or in other circumstances shall not be effected thereby and shall be enforced to the greatest extent permitted by law.

14. ENTIRE AGREEMENT

This Agreement and Exhibits constitute the entire Agreement among the partners and all other and prior Agreements among the parties relating to such subject matter are hereby cancelled and superseded in their entireties. No variations, modifications or changes herein or hereof shall be binding upon any party hereto unless set forth in a document duly executed by such party.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of 4/17/07 be effective as of 4/17/07.

JEFFERSON COUNTY DEPARTMENT  
OF HEALTH AND ENVIRONMENT

Cathy Corcoran

Cathy Corcoran, President  
Board of Health

ATTEST:

By:

Bonnie McNulty  
Bonnie McNulty, Secretary  
Board of Health

CONTRACTOR

Ed Fleming

02-069531  
SSN / EIN

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**  
**Service Agreement: SCOPE OF WORK**

**GENERAL DESCRIPTION AND SPECIFICATIONS**

**GENERAL DESCRIPTION**

The service provider shall conduct an Integrated Mosquito Management (IMM) Program for Jefferson County Department of Health and Environment (JDCHE) during the spring, summer and fall of 2007. This program will be designed and implemented to control the spread of the West Nile Virus (WNV) and other mosquito-borne diseases such as Western Equine Encephalitis (WEE) by reducing the number of disease causing mosquitoes.

The service provider shall employ established IMM principles and practices to reduce the numbers of disease causing mosquitoes in Jefferson County. These principles and practices include: identification and classification of mosquito breeding habitat, surveillance of adult and larval mosquitoes, larval mosquito control (application of larvicides, source reduction, and/or biologic controls), and public education and outreach. Adulticiding - the killing of adult mosquitoes through aerial sprays and fogging - is not anticipated but the service provider shall maintain the capabilities to implement, manage, and / or provide properly trained staff and supervisors to conduct adulticiding if requested by JCDHE to do so.

The service provider shall provide the following IMM services within the service area:

- A. Adult Mosquito Surveillance
- B. Larval Mosquito Surveillance and Control
- C. Public Education
- D. Reporting
- E. Record Keeping
- F. Adult Mosquito Control Service Coordination
- G. Department Employee Training
- H. Board of Health Appearances

The service provider shall follow all applicable and appropriate Federal, State, and Local rules and regulations such as EPA, OSHA, FIFRA and the like pertaining to the implementation of the IMM services provided by the service provider in this Scope of Work.

The service area is generally described as the "plains" area of Jefferson County Colorado and consists of approximately 153 square miles. Specific requirements pertaining to the service area, the services to be provided, term of the contract, and the work products are described in the Specifications section of this Scope of Work.

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**  
**Service Agreement: SCOPE OF WORK**

**SPECIFICATIONS**

**I. SERVICE AREA**

The service area is generally described as the "plains" area of Jefferson County bounded by Broomfield County on the north, Chatfield State Park on the south, Sheridan Boulevard on the east, and the Hogback on the west. The 2006 Integrated Mosquito Management Service Area Map (Attachment A) illustrates the service area and the known potential larval development (PLD) sites. A summary of the service area is provided in the table below.

<b><u>Area / Municipality</u></b>	<b><u>Square Miles</u></b>
Unincorporated Jefferson County	77.2
Edgewater	0.7
Lakeside	0.3
Littleton	0.6
Morrison	1.2
Mountain View	0.1
Golden	9.3
Wheat Ridge	9.5
Lakewood	26.7
Bow Mar	0.3
Arvada	27.5
Total Square Miles:	153.4

**II. SERVICES TO BE PROVIDED**

**A. Adult Mosquito Surveillance**

1. The service provider shall provide all supplies, equipment and personnel to operate and maintain:
  - a) Sixteen (16) CDC light traps at various sites selected with the concurrence of JCDHE within the service area. These traps shall be operated one night per week on the same day of the week for a period of 13 weeks from June 4, 2007 to August 31, 2007
  - b) Nine (9) gravid traps at sites selected with the concurrence of JCDHE within the service area. The gravid trap sites may or may not coincide with the CDC light trap sites identified in paragraph a) above. These traps shall be operated one night per week on the same day of the week for a period of 13 weeks from June 4, 2007 to August 31, 2007.

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

- c) Five (5) traps, included in paragraphs A, 1, a & b above, a second night each week during the period of June 25, 2007 through August 10, 2007 as part of the Mosquito Sentinel Program in accordance with state guidelines. The Mosquito Sentinel Program trap locations will be designated by JCDHE in collaboration with the service provider.
2. If for any reason, such as inclement weather, any of the trap nights described in paragraph a, b, and/or c above is cancelled, the service provider shall notify JCDHE immediately. JCDHE may require the service provider to reschedule the cancelled trap night as conditions allow.
  3. After each trap night the service provider shall collect, identify, speciate, and count all trapped mosquitoes by methods recognized by CDC and/or the Colorado Department of Public Health and Environment (CDPHE) and report this information to JCDHE at least once per week.
  4. All mosquito trapping activities including the submission of mosquito pool specimens shall be conducted in accordance with the protocols established in the current CDPHE Mosquito Surveillance Plan. A copy of the CDPHE 2005 Mosquito Surveillance Plan and West Nile Virus Mosquito Testing 2007 Sentinel Zone Protocol are provided in Attachment B and C respectively. CDPHE updates or changes to these plans will provided by JCDHE to the service provider.
  5. The service provider shall assume all liability for the placement and operation of any and all equipment. JCDHE shall not be responsible for any lost, damaged or stolen traps and/or equipment.
  6. The service provider shall maintain a toll-free (in Colorado) telephone line and shall accept calls from the public reporting mosquito problems and/or standing, stagnant water in the service area that may indicate the presence of PLD sites. The service provider shall maintain a log of calls received and shall summarize call activity in weekly and annual reports.
- B. Larval Mosquito Surveillance and Control:** The primary and priority focus of larval control will be for those mosquitoes competent to transmit diseases such as WNV. All mosquito complaints shall be thoroughly investigated and larval control implemented based a balanced evaluation of risk associated with concurrent infestation with mosquitoes presenting a public health problem and impact on quality of life in the community.

**Initial Inspection of PLD Sites:** By June 21, 2007 the service provider shall conduct an initial inspection of all known PLD sites within the service area. At the end of the 2006 IMM season there were approximately 600 known PLD sites

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

contained in the 153.4 square mile service area. The 2007 IMM service area and known PLD sites are identified on the Jefferson County Integrated Mosquito Management Service Area Map (Attachment A).

The purpose of the initial PLD inspection is to classify each PLD site as "targeted" or "non-breeding". Targeted PLD sites are those sites which have the highest potential for mosquito breeding. The remaining sites shall be classified as non-breeding PLD sites or removed from the list of PLD sites if the site no longer has the potential to breed mosquitoes. Any new PLD sites identified during the initial inspection of PLD sites shall be added to the list of PLD sites and shall be classified as "targeted" or "non-breeding".

On or before June 30, 2007 the service provider shall provide an updated list, based on the previous end-of-season PLD inventory, of all PLD sites and their classification. The list shall include the service provider's recommendations for additions, deletions, and/or revisions to the list of PLD sites.

1. **Larval Mosquito Surveillance and Control:** Upon completion and/or commensurate with the initial inspection of designated PLD sites, the service provider shall commence the following routine PLD surveillance and larval control activities:
  - a) Targeted sites shall be inspected at least once per week by visual observation and by dipping any standing water for mosquito larvae.
  - b) Non-breeding sites shall be inspected based on changes in climactic conditions but at least once per month to determine if any changes have occurred that would warrant a re-evaluation of their status.
  - c) Storm water structures shall be inspected based on environmental conditions that could promote the development of mosquito larva at such structures. Strategically located storm water structures (catch basins, detention ponds, storm water inlet boxes, and the like) shall be inspected at least once per week for the presence of mosquito larvae. The results of the storm water structure inspections shall be included in the weekly totals and year to date totals in the weekly reports.
  - d) During the course of conducting IMM activities, identify any additional and/or new PLD sites by noting any areas of clogged ditches and streams, standing water, etc., and inspect and classify each additional and/or new PLD site as a targeted or non-breeding site. All additional and/or new PLD sites shall be mapped and recorded, regardless of their classification. Note such features as abandoned swimming pools, etc., which have the potential for supporting larval development, report these features to

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

JCDHE, and work with local code enforcement officials to locate, identify, and apply the appropriate IMM measures to these sites.

- e) If it is determined that any PLD site in a, b, c, and/or d above are producing *Culex* sp. or other potential arboviral vector mosquitoes, apply the appropriate, federally approved materials, such as but not limited to 180-day briquettes, 30-day residual pellets, granular larvicides, monomolecular oils, etc. and/or utilize other recognized methods of larval control such as source reduction.
- f) Use the most appropriate method for larvicide distribution, such as hand application, backpack broadcasters, All Terrain Vehicle (ATV), etc.
- g) Maintain Material Safety Data (MSD) sheets for all products used and provide such information upon request to employees, the public, and/or JCDHE.
- h) As appropriate, conduct and document post-treatment quality control inspections within 24 to 48 hours to assure the larvae population has been controlled. If larvae are found, a second application of control material shall be applied. These activities shall be included in the weekly activity reports.
- i) Develop a method to contact private property land owners and obtain permission to enter property to conduct IMM activities. Entry onto private property shall be by prior authorization of the owner/agent.
- j) Maintain real-time documentation of all PLD site surveillance and larval control activity and enter real-time data into a JCDHE approved electronic database. An electronic copy of the database shall be provided to JCDHE on or before November 1, 2007 and/or upon the request of JCDHE.

**C. Public Education**

1. The service provider shall maintain a public education website providing general information on WNV and WEE, including basic disease information, tips for personal protection, information for homeowners on standing water, aerial spraying information (if appropriate), phone numbers to call, links to other websites, etc.
2. The service provider shall coordinate with JCDHE to provide printed public education information relating to WNV and/or WEE for the topics referenced in paragraph 1, above.
3. In the event that adulticiding or aerial spraying is to be performed, the service provider shall notify all residents in the area to be sprayed who are registered

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

in the State of Colorado Pesticide Sensitive Registry. A minimum of 3 attempts shall be made to reach these persons prior to the spraying or application. The Ultra Low Volume (ULV) insecticide application will be shut off in front of and upwind from sensitive resident's properties. The service provider shall maintain MSD sheets for all products used and shall provide such information upon request to employees, the public, and/or JCDHE. If adulticide spraying is required the service provider shall collaborate with JCDHE to coordinate the delivery of these services.

**D. Record Keeping**

The service provider shall maintain all records and documents pertaining to the services provided under this contract for a period of 3-years. By December 1, 2007 and/or upon the request of JCDHE, the service provider shall provide JCDHE with copies of any and all records and documents pertaining to the services provided under this contract in an electronic and/or hard copy format approved by JCDHE.

**E. Reporting**

1. **Weekly Report:** The service provider shall provide a weekly summary report of IMM service activities. Weekly reports shall include but not limited to:

- a) The total number of PLD site inspections and post-treatment quality control inspections performed and the number these inspections for each municipality and for the unincorporated area of the County.
- b) The number of larvicide applications, including products used and methods of dispersal.
- c) The number of mosquitoes caught in light and gravid trapping, including the number of the various Culex or other arboviral vector species.
- d) The number of inspectors used and the amount of time spent conducting contract work, reported as larval inspection time, mosquito trapping time, and office or support time.
- e) The number of complaints received, areas inspected because of those complaints, the findings of each inspection and actions taken.

2. **Annual Report:** By December 1, 2007 the service provider shall provide an annual report to JCDHE regarding all IMM service activities performed under this contract. The annual report shall be provided in a format acceptable to JCDHE both electronically and in hard copy (5 copies) and shall include but not limited to:

- a) surveillance activities and findings,



**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**  
**Service Agreement: SCOPE OF WORK**

- b) total hours logged for each service activity by the service provider and its employees,
- c) total number of PLD sites inspected, total number of sites treated, total number of mosquito trap nights, etc.
- d) an end of season map that illustrates the PLD sites identified and inspected during the contract season,
- e) the GIS shape files or other electronic files used to create the PLD site map,
- f) a complete list of all PLD sites and their classification. The PLD list shall include the service provider's recommendations for additions, deletions, and/or revisions to the list of PLD sites.

**F. Adult Mosquito Control Program Development and Coordination:** In the event of a Public Health Emergency, the service provider shall assist JCDHE in the development of timely adult mosquito control programs, such as ground and/or aerial adulticide spraying. Adult mosquito control programs shall be conducted accordance with all state and federal requirements. The cost of this service and adult mosquito control programs are not included in this contract.

**G. Department Employee Training:** Upon request the service provider shall provide up to four (4) hours of training for Department employees.

**H. Board of Health Appearances:** Upon request the service provider shall appear before the Jefferson County Board of Health to provide updates and/or a year-end report on contract activities. Up to six Board of Health appearances may be requested by JCDHE.

### **III. TERM OF SERVICE AGREEMENT**

The Service Agreement shall be in effect for the period beginning April 17, 2007 through December 31, 2007. All field service activities shall commence no later than June 1, 2007 and shall continue until JCDHE determines that a specific field service is no longer needed, but no later than September 30, 2007.

### **IV. WORK PRODUCTS**

Any and all maps, reports, spreadsheets, databases, geographical information system (GIS) files, newsletters and other hard copy or electronic documents generated by the service provider in fulfillment of its obligations under this contract shall be the property of JCDHE, who shall have sole and complete discretion regarding their use and distribution. All work products shall be delivered to JCDHE in a mutually agreed upon hardcopy and/or electronic format suitable for including in reports and folders. The data

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

and weekly reports will be furnished in standard 8 ½ by 11 inch paper. All reports will include the activity undertaken in each of the cities in the County. Delivery of the principal work products shall be provided according to the following delivery schedule.

**Work Product Delivery Schedule**

<b>Work Product</b>	<b>Delivery Date</b>
Begin Larval Mosquito Surveillance and Control	June 1, 2007
Begin Adult Mosquito Surveillance	June 4, 2007
First Weekly Report	June 8, 2007
Complete Initial Inspection of PLD Sites	June 21, 2007
Provide updated list of PLD sites and their classification	June 30, 2007
End Adult Mosquito Surveillance	August 31, 2007
End Larval Mosquito Surveillance and Control	September 30, 2007
Last Weekly Report	October 5, 2007
Electronic database of larval surveillance and control activities	November 1, 2007
Copy of records and documents pertaining to 2007 IMM services under this contract	December 1, 2007
First draft Annual Report	December 1, 2007
Final draft Annual Report	December 31, 2007

**ACRONYMS**

**Acronym Definition**

- CDC Centers for Disease Control and Prevention
- CDPHE Colorado Department of Public Health and Environment and its employees
- GIS Geographical Information Systems
- IMM Integrated Mosquito Management
- JCDHE Jefferson County Department of Health and Environment and its employees
- MSD Material Safety Data
- PLD Potential Larval Development
- WEE Western Equine Encephalitis
- WNV West Nile Virus

Attachment A: Jefferson County IMM Program Service Area Map

Attachment B: CDPHE 2005 Mosquito Surveillance Plan

Attachment C: CDPHE West Nile Virus Mosquito Testing 2007 Sentinel Zone Protocol

# 2006 Integrated Mosquito Management Service Area Map

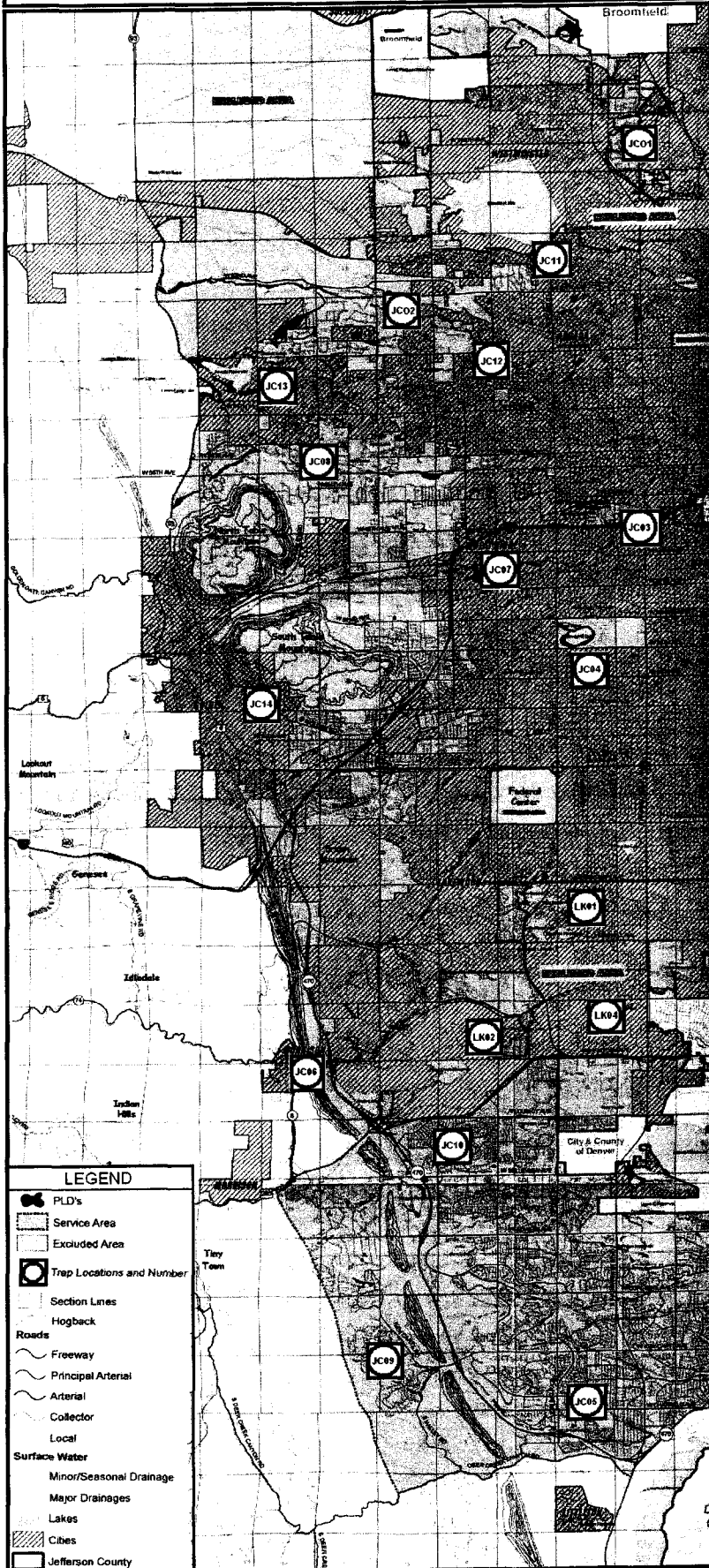


Figure #: 1  
 Figure Title: 2006 Service Area Map  
 Project: Jefferson County IMM Program



## Attachment B



Colorado Department  
of Public Health  
and Environment

# 2005 Mosquito Surveillance Plan

3/23/05

## A. Introduction:

Mosquito trapping and testing data provide both qualitative and quantitative information on arbovirus activity and potential human risk in an area. Advances in testing mosquito pools and calculation of minimum infection rates allow an integrated system based on mosquito surveillance to comprise a large part of the arbovirus surveillance strategy. Testing will focus on *Culex* species of mosquitoes, as these are the primary human vectors.

## B. Plan Description:

Mosquito testing this season will remain essentially unchanged from 2004. It will again have a three-tiered approach utilizing, once again, *sentinel*, *floater*, and *permanent* mosquito trap sites. *Sentinel* sites (see attached *Mosquito Sentinel Site Guidelines*) will act as a longitudinal system to replace chicken flocks, provide population data based on a consistent trapping protocol, and allow testing for the three arboviruses present in Colorado (Western equine, St Louis, and West Nile). *Permanent* traps are the long-term mosquito trap sites that local surveillance / control operations maintain at their own discretion, above and beyond the sentinel sites agreed to by CDPHE. *Floater* traps are those that are deployed based on current surveillance data such as positive birds and horses or human cases to provide local risk assessment, and to support local control and prevention decisions.

### Sentinel Traps

Unlike sentinel chicken flocks, whose sole purpose as a surveillance tool was to detect the presence of mosquito borne viruses, mosquito sentinel sites will also provide temporal mosquito population data, species make-up, and infection rate data. In addition, the long-term baseline data that will be collected, using a standardized trapping and testing protocol, can be used to accurately compare year-to-year changes in mosquito populations. It is hoped that this approach can be sustained and provide a long-term surveillance system for arbovirus activity into the future.

Mosquitoes will be collected at the sentinel sites weekly and all pools of *Culex* species will be tested for WNV using RT-PCR. A sample of submitted pools will also be tested for Western Equine Encephalitis (WEE) and St. Louis Encephalitis (SLE) viruses. This will permit accurate mosquito infection rates to be calculated. The number of sentinel mosquito trap sites will increase slightly (21 sites) from last season (15 sites) to upgrade the level of coverage across the state. As was the case last season, the selection of *sentinel* sites will

## Attachment B

be determined by geographic location and the willingness of the local health agency, MAD, etc. to assume the responsibilities of maintaining a site during this and subsequent years.

### Floater Mosquito Traps

“Floater” mosquito trap testing will integrate the qualitative virus data collected from dead birds, horse and human cases with the quantitative data mosquito trapping can provide. Local agencies will decide the need for trapping in their area, which should be driven by positive virus findings using other surveillance tools (positive dead birds or horses). These trap site locations are expected to change from year to year based on local surveillance needs.

### Permanent Mosquito Traps

The third category of mosquito trapping includes *permanent* mosquito trap sites that local organizations and agencies operate and maintain, usually to monitor nuisance mosquito populations. The testing of Culex pools collected from these traps depends largely upon the conditions that exist at that site. Sampling and testing criteria will be discussed below (see C. 3. c. *Mosquito testing criteria*).

### **Surveillance Dates to Remember**

Dead bird and mosquito surveillance activities will commence **May 1<sup>st</sup>**. Initial testing will focus on dead birds as they will be a more sensitive indicator of virus activity early in the season when mosquito populations and infection rates are low. Once virus is detected in an area, mosquito testing should be used to assess the level of risk for human transmission. Dead bird testing should be limited to no more than two or three WNV+ birds from the same area (i.e., approx. 5 mi<sup>2</sup> area or 1.25 mi. radius). Further bird testing does not provide additional information and expends limited lab resources. **Unlike last season however, corvid bird specimens meeting sampling criteria will be accepted beyond the July 1<sup>st</sup> deadline date for bird testing if no other WNV + birds or other surveillance tool indicates virus activity in that area.**

All Culex spp. mosquito pools from **sentinel** trap sites will be tested using RT-PCR at the CDPHE/LSD lab in Denver. However, mosquito pools from **sentinel** traps in Moffat, Mesa, and Delta counties will be sent to and tested at the regional laboratory in Grand Junction.

**Prior to July 1<sup>st</sup>**, Culex mosquito pools from *floater and permanent* traps should be tested at the CDPHE Laboratory Services Division (LSD) using RT-PCR because of its greater sensitivity.

**Zone Trapping:** During this early trapping period (May 1<sup>st</sup> to July 1<sup>st</sup>), in an effort to stretch diagnostic resources, surveillance participants are strongly encouraged to “zone” trap their **floater and permanent** trap captures. That is, co-mingle, by species, Culex mosquito captures from several floater or permanent traps in a general geographic area to increase the size of pools being tested. Because early season Culex numbers are not expected to be very high until later in the season, pooling captures from several traps will reduce the number of small mosquito pools that use the same test as would a pool of 50

## Attachment B

mosquitoes. If a positive, co-mingled pool is detected, subsequent collections specific to a trap may be submitted in order to determine which trap the positive pool came from. After July 1<sup>st</sup>, when expanding *Culex* mosquito populations and increasing infection rates should offset the lower sensitivity of VecTest®, mosquitoes from these floater and permanent traps will be tested by VecTest® at the six regional laboratories. If WEE or SLE activity is observed, regional labs will be provided with multi-antigen VecTest® kits valid for all three viruses.

Participants in the surveillance program are encouraged to use limited mosquito testing resources responsibly. At this time there will be no testing quota assigned to each county. Depending on the intensity of virus activity that is detected, the risk of human exposure, planned control efforts, etc., diagnostic resources may be diverted to where they are needed most. Regional epidemiologists and CDPHE will be monitoring diagnostic resource usage, suggesting where testing is needed and curtailing usage when it's appropriate based on virus activity and the resources that are available for that region or county.

### C. Plan Criteria:

#### 1. Sentinel Mosquito Trap Sites:

##### a. Obligations:

- 1) Trapping Schedule: weekly from early May through September. In 2005, it is recommended that a trapping frequency of one night per week be observed, adding additional nights if needed due to inclement weather.
- 2) Each site will consist of 2 CDC CO<sup>2</sup> baited, light traps and one gravid trap.
- 3) Traps shall be properly maintained and baited appropriately (i.e., dry ice for light traps and straw-manure infusion for gravid traps). See "Mosquito Trapping and Handling Protocol" dated 4/29/04.
- 4) Accurate records maintained (date, # trap nights, # mosquitoes by species, *Culex* population density, weather conditions, etc.)
- 5) **Weekly** submission of *Culex* mosquito pools and data to LSD in Denver or if the pools are from Mesa, Delta, and Moffat counties, pools should be sent to the regional lab in Grand Junction.
- 6) Calculation of Infection Rates

##### b. Site considerations:

- 1) Care should be used in selecting a sentinel trap site so they do not have to be moved to insure continuity of data. Site should be stable and easily accessible.
  - 2) Site has a history of significant *Culex* mosquito activity and close proximity to appropriate *Culex* breeding habitat
  - 3) Close proximity to human populations
  - 4) Availability of resting sites and protection from wind (e.g., culverts, fences, shrubbery, trees, sheds, etc.)
  - 5) Away from competing sources of light (light traps) or oviposition sites (gravid traps).
  - 6) Avoid areas where heavy, regular adult mosquito and/or insect control are performed.
  - 7) History of past arbovirus activity.
- Note: "*Sentinel*" trap sites should remain at the same site each season; however, traps can be moved within a general area (< 0.5 mile) of similar habitat in order

## Attachment B

to improve trap performance and are not required to hang from the same tree week after week.

- c. Mosquito pooling suggestions:
  - 1) Sorted Culex mosquitoes of the same species from the two light traps can be co-mingled into common pools.
  - 2) Sorted mosquitoes from the gravid traps **cannot** be co-mingled with the same species from light traps. They must remain segregated in separate pools.Note: to calculate mosquito population density, take the total number of captured mosquitoes, by species, and divide by the number of trap nights.

### 2. Floater Mosquito Traps

- a. Location preferences: same as above, except that a confirmed, infected dead bird, horse, and/or human case has been reported in the area.
- b. Deployment considerations:
  - 1) Surveillance data will be used to support mosquito control activities .
  - 2) Trap(s) deployed for a minimum of two (2) weeks.
  - 3) Trap(s) operated a minimum of one night per week, adjusted to allow for inclement weather.
  - 4) Traps properly maintained and baited appropriately.
  - 5) Mosquito captures sorted and pooled. Culex species submitted to the appropriate regional lab or LSD lab for testing.
- c. Obligations:
  - 1) Trap data (e.g., trap nights, species, #'s, dates, Culex population density, weather conditions, etc.) maintained.
  - 2) Calculation of Infection Rates
  - 3) "**Zone Trapping**" see above.

### 3. Permanent Mosquito Traps

- a. Location preferences: same as those described for *sentinel* and *floater* traps.
- b. Deployment considerations: the selected location has a history of trapping at that site.
- c. Mosquito testing criteria:
  - 1) Many permanent traps have an established history and have collected an abundance of mosquito data over the years, but often have been deployed as a result of nuisance mosquito monitoring as opposed to arbovirus activity in which case, nuisance mosquito species will not be tested at this time
  - 2) Culex mosquitoes from permanent traps should be tested if the site is within 1.25 mi. of a WNV+ bird, horse or human case, a sustained increase in the Culex mosquito population is noted, and/or the site provides the only arbovirus surveillance data for that area.
- c. Obligations:
  - 1) Trap data (e.g., trap nights, spp. #'s, dates, Culex population density, weather conditions, etc.) maintained.
  - 2) Calculation of Infection Rates
  - 3) "**Zone Trapping**" see above.



## West Nile Virus Mosquito Testing 2007 SENTINEL ZONE PROTOCOL

### Sentinel Zone Concept

The goal of surveillance for mosquito-borne viruses (WNV, SLE, WEE) is to determine the human transmission risk in order to implement control and prevention strategies. To facilitate a standardized method of data collection and insure continued operation during anticipated budget reductions, the mosquito sentinel site concept was launched in 2004. Although these sites have, in general, accurately assessed West Nile Virus (WNV) activity in the region some problems have been identified. Specifically there was concern that a single site provided a poor representation of the region's mosquito populations and, more importantly, a single site was vulnerable to environmental changes that could reduce its effectiveness.

To address the problems associated with a single trap location, the sentinel site concept is being modified into a "Sentinel Zone" approach. Within a defined "sentinel zone" mosquito traps are set in strategic locations to ensure successful trapping of adequate numbers of mosquitoes throughout the WNV season. If one trap or site becomes inoperable, mosquitoes from other traps in the zone can still be tested and the poor trap site can be relocated to another location within the zone.

Following standardized trapping and testing protocols, a sentinel zone would provide data about mosquito population density, species make-up and arboviral activity that is comparable over the years. Furthermore, this approach will provide sufficient mosquito testing volume for calculating accurate infection rates to allow control decisions to be made (i.e. to spray or not to spray) in time to have a public health benefit. All *Culex* species mosquitoes collected in the sentinel zones will be tested for WNV by RT-PCR and a sample of the submitted pools will also be tested for Western equine encephalitis (WEE) and St. Louis encephalitis (SLE).

### Scope of Work

- 1) Defining a zone: Local agencies can determine where a zone will be located and what geographic area it will encompass within the following parameters:
  - ✧ A zone will be a circle with a minimum radius of 1.5 miles and a maximum radius of 5 miles
  - ✧ The center point of the circle will be used as the geo reference point for the zone (latitude/longitude).
  
- 2) Trap placement: Each zone will consist of five CO<sub>2</sub> baited light traps. Local agencies can determine where within the zone these traps are located.
  - ✧ Gravid traps or additional light traps can be maintained in the zone, however mosquitoes from other traps cannot be combined with the five zone traps for either testing or calculation of infection rates.
  - ✧ The same location for each trap must be used throughout a season. However, when necessary a non-producing trap can be moved to another location within the zone although this should be minimized and occur early in the season.





## Attachment C

- 3) Trapping schedule: To better reflect the WNV transmission season in Colorado AND ensure the majority of samples ( $\geq 60\%$ ) are tested during the peak of the transmission season the following schedule will be used. This schedule will result in a total of 100 trap/nights per zone for the season. Agencies can decide which night of the week to use although the same day should be used each week when possible
  - ◇ Weeks of June 4<sup>th</sup> through June 18<sup>th</sup>, 2007 – trap one night per week
  - ◇ Weeks of June 25<sup>th</sup> through August 6<sup>th</sup>, 2007 – trap two nights per week
  - ◇ Weeks of August 13<sup>th</sup> through August 27<sup>th</sup>, 2007 – trap one night per week
  
- 4) Mosquito Submission: The 5 traps within the sentinel zone could be viewed as one large mosquito trap from which the pooled infection rate and vector index will be calculated to assess human risk.
  - ◇ All female *Culex* mosquitoes trapped in a sentinel zone must be submitted to the state lab.
  - ◇ Submit mosquitoes in separate pools by *Cx. taralis* and other *Culex* (i.e. *Cx. pipiens*, *Cx. erythrothorax*, *Cx. resturans* combined).
  - ◇ Pool size can be up to 65 mosquitoes per vial.
    - CRITICAL -- the exact number of mosquitoes per vial must be recorded as this affects the infection rate calculations.
  - ◇ *Culex* mosquitoes captured in the 5 zone traps and the captures from the 2 nights per week during the peak of the trapping period should be co-mingled into the minimum number of pools. This will extend limited testing resources.
  
- 5) Data Maintenance: Accurate records of trapping results must be maintained to allow year-to-year comparisons and monitor trends in mosquito populations. Dramatic changes in *Culex* numbers or proportions can provide an early indication of increasing human risk.
  - ◇ It is **strongly** recommended that all mosquitoes in the traps be identified to species and that population data be maintained for all species.
  - ◇ At a minimum, data to maintain should include: trapping dates, # mosquitoes in the zone traps, *Culex* population density by species (*Cx tarsalis* and other *Culex* at a minimum), and weather conditions on night of mosquito trapping.
  - ◇ At the end of the season, a file with the sentinel zone data for the entire season (preferably in electronic format) must be sent to CDPHE.
  
- 6) Other Considerations:
  - ◇ Sentinel zones should contain areas that are suitable for *Culex* mosquitoes to breed and are in close proximity to human populations.
  - ◇ Sentinel zone traps should not be located in an area with regular, heavy spraying operations for adult mosquito or other arthropod control (orchards or agriculture areas). Areas with ongoing larviciding are OK.
  - ◇ Traps within a zone should have an availability of mosquito resting sites and protection from wind (i.e. culverts, fences, shrubbery, trees, sheds, etc) and should be placed away from competing sources of light and carbon dioxide (e.g., a stockyard).
  - ◇ Traps should be placed on the leeward side of obstacles if possible. For example, if the prevailing wind is generally from the west just after dusk, try to place the trap on the east side of trees, sheds, etc.

**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**

**STATEMENT OF CONFIDENTIALITY**

Clients of JCDHE have the right to protection of their personal and confidential information. This protection is required of all staff, business associates, independent contractors, students, volunteers, and any other individuals that access paper and electronic records. State statutes and Federal regulations require this protection by the department and individuals.

Appropriate and proper uses and disclosures of protected health information are described in the department's Policy 5 and the Notice of Privacy Practices. Every individual in the department that has access to protected health information is responsible for the proper use and disclosure of this information. (See the Health Insurance Portability and Accountability Act of 1996, 42 U.S.C., regulations at 45 C.F. R. Parts 160 and 164.)

Specific state statutes and Federal laws govern the use and disclosure of information about clients enrolled in our alcohol and substance abuse programs. (See 42 U.S.C. 290dd-3 & 42 U.S.C. 290ee-3 and 42 CFR Part 2 for law and regulations.) Violation of these laws and regulations is a crime and will be reported.

*I understand that violation of the department's privacy practices and policies is punishable by the county disciplinary policy and various state and Federal laws. I will not use or disclose any protected health information in violation of these policies, laws and regulations. I have received a copy of the department's Privacy Policy and the Notice of Privacy Practices.*

Ed Fleming 4-30-07  
Staff / Business Associate / Independent Contractor / Student / Volunteer Signature Date

Ed Fleming Otter Tail Environmental, Inc.  
Print Name

**INTERGOVERNMENTAL AGREEMENT FOR COOPERATIVE  
MOSQUITO MANAGEMENT PROGRAM**

**THIS INTERGOVERNMENTAL AGREEMENT** is made and entered into and effective as of the 17th day of April, 2007, between the **JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**, whose address is 1801 19<sup>th</sup> Street, Golden, CO 80401, hereinafter referred to as the "Health Department"; and the **CITY OF GOLDEN**, a municipal corporation of the State of Colorado, with its principal office located at 911 10<sup>th</sup> Street, Golden, CO, hereinafter referred to as "Golden."

**WITNESSETH:**

**WHEREAS**, the objective of public health mosquito control is to prevent the mosquito-borne transmission of diseases to humans, livestock, and domestic pets, and in order to effectively deal with the continuing threat of mosquito-borne transmission of West Nile Virus and other arboviral diseases, the Health Department has contracted with OtterTail Environmental, Inc., ("OtterTail") for Integrated Mosquito Management ("IMM") services within certain areas of Jefferson County, Colorado, during the year 2007; these services shall be provided to Jefferson County and various municipalities within Jefferson County at a cost per square mile basis, and

**WHEREAS**, said IMM services are detailed in a document entitled PURCHASE OF SERVICES AGREEMENT, signed April 17, 2007, which includes the scope of work, the service area map, the mosquito surveillance plan, the sentinel zone protocols, and a copy of the signed confidentiality statement; a copy of which is attached hereto and incorporated herein as **Attachment A**, and

**WHEREAS**, for a price to be paid to OtterTail by Golden through payment to the Health Department, OtterTail, through the direction of the Health Department, will perform the IMM services as detailed in **Attachment A** for an area of approximately 9.3 square miles located within the boundaries of Golden; and

**WHEREAS**, the parties now desire to enter into this Intergovernmental Agreement so as to memorialize their agreement with respect to their respective responsibilities regarding the provision of such IMM services within Golden's boundaries.

**NOW, THEREFORE**, in consideration of the mutual promises and covenants contained herein, the parties hereto agree as follows:

1. **PROVISION OF IMM SERVICES WITHIN GOLDEN:** Upon the signing of this Intergovernmental Agreement by the parties hereto, the Health Department will direct OtterTail, during the year 2007, to perform the IMM services set forth in **Attachment A** for an area of approximately 9.3 square miles located within the boundary of Golden. The services and service fee do not include adulticide services. The Health Department will monitor the need for adulticiding and will advise the County and all participating municipalities if an adulticide program is recommended and approved by the Board of Health and Board of County Commissioners.

2. **PROVISION OF OTHER IMM SERVICES BY GOLDEN:** Golden shall designate a point of contact for communication with the Health Department; provide public education to their citizens; refer citizen complaints to OtterTail; coordinate with the Health Department on IMM services or concerns; and advise the Health Department, by report, of the IMM services, if any, conducted or directed by Golden. The IMM service reports shall be submitted on a monthly basis on or before the 5th of the month effective July 2007 and ending October 2007. The monthly IMM service report, with the notation "re: West Nile IGA Report", shall be sent to Jefferson County Department of Health and Environment, 1801 19th Street, Golden Colorado 80401.
3. **MONITORING THE PROVISION OF IMM SERVICES:** Staff from the Health Department will monitor the work of OtterTail and Golden to ensure that the IMM services detailed in Paragraph 1 and 2 above are fulfilled. The Health Department will be responsible for coordinating between OtterTail and Golden for the delivery of IMM services detailed in **Attachment A**. As needed, the Health Department will provide Golden with public education information and periodic reports regarding the status of mosquito-borne diseases and vector control. Questions regarding the Health Department's IMM services shall be through Dr. James Dale, Jefferson County Department of Health and Environment, 1801 19th Street, Golden, Colorado, 80401; PHONE: 303-271- 5718; FAX: 303-271-5702; EMAIL: [jdale@jeffco.us](mailto:jdale@jeffco.us).
4. **PAYMENT OF GOLDEN IMM SERVICE FEE:** Golden agrees to pay to the Health Department six thousand four hundred sixty three and 50/100 dollars (6,463.50) which is equal to 50 percent of the total Golden IMM service fee of twelve thousand nine hundred twenty seven dollars (\$12,927.00) to reimburse the Health Department for Golden's share of the IMM services performed by OtterTail. After execution of this Intergovernmental Agreement by the last party, Golden shall pay the Health Department in three equal payments of two thousand one hundred fifty four and 50/100 dollars (\$2,154.50) in response to July, August and September invoices from the Health Department. The payment, with a notation "re: West Nile IGA", shall be sent to Jefferson County Department of Health and Environment, 1801 19<sup>th</sup> Street, Golden Colorado 80401.
5. **PAYMENT OF UNINCORPORATED JEFFERSON COUNTY IMM SERVICE FEE:** The Health Department will pay for and direct OtterTail to perform the IMM services as set forth in **Attachment A** located within unincorporated Jefferson County.
6. **TERM:** The term of this Intergovernmental Agreement shall be from the date of signature by the last party hereunder to and until December 31, 2007.
7. **LIABILITY INSURANCE COVERAGE/INDEMNITY/WARRANTY:** As described in Paragraphs 5 and 6 of the PURCHASE OF SERVICES AGREEMENT, OtterTail shall maintain liability insurance coverage and will hereby indemnify and hold the Health Department and Golden harmless from all claims, damages, loss, injury, cost and expense, including attorneys' fees resulting from or related to any negligent or intentional acts or omissions of OtterTail, its agents, employees, subcontractors and consultants, in its performance of the agreement. A copy of OtterTail's Certificate of Liability Insurance is provided as **Attachment B**.
8. **NO GUARANTEE BY THE HEALTH DEPARTMENT:** Golden acknowledges that although the objective of the IMM services to be performed within Golden's boundaries by OtterTail is to

reduce the mosquito population and the consequent threat of transmission of West Nile Virus, the Health Department makes no guarantee as to the effectiveness of such IMM services in achieving such objective.

9. **ENTIRE AGREEMENT:** This writing constitutes the entire Intergovernmental Agreement between the parties hereto with respect to the subject matter herein, and shall be binding upon said parties, their officers, employees, agents and assigns and shall inure to the benefit of the respective survivors, heirs, personal representatives, successors and assigns of said parties.
10. **NO WAIVER OF IMMUNITY:** No portion of this Intergovernmental Agreement shall be deemed to constitute a waiver of any immunities the parties or their officers or employees may possess, nor shall any portion of this Intergovernmental Agreement be deemed to have created a duty of care which did not previously exist with respect to any person not a party to this Intergovernmental Agreement.
11. **NO THIRD PARTY BENEFICIARY ENFORCEMENT:** It is expressly understood and agreed that the enforcement of the terms and conditions of this Intergovernmental Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to the undersigned parties and nothing in this Intergovernmental Agreement shall give or allow any claim or right of action whatsoever by any other person not included in this Intergovernmental Agreement. It is the express intention of the undersigned parties that any entity other than the undersigned parties receiving services or benefits under this Intergovernmental Agreement shall be an incidental beneficiary only.

Signed by the parties' the \_\_\_\_\_ day of \_\_\_\_\_, 2007.

Jefferson County Department of Health and Environment

By: Bonnie McNulty By: Cathy Cuernan  
Secretary to the Board of Health President  
Jefferson County Board of Health Jefferson County Board of Health

ATTEST: CITY OF GOLDEN, a municipal corporation of the STATE OF COLORADO

By: \_\_\_\_\_ By: C. J. Barock  
City/Town Clerk Mayor

APPROVED AS TO FORM.

By: [Signature]  
City Attorney

# **Attachment A**

## PURCHASE OF SERVICES AGREEMENT

THIS AGREEMENT, dated for reference purposes only the 30th day of March, 2007, is made and entered into by and between the **Jefferson County Department of Health and Environment (JCDHE)**, 1801 19<sup>th</sup> Street, Golden, CO 80401, hereinafter referred to as "JCDHE", and **Otter Tail Environmental, Inc.**, 1045 N. Ford Street, Golden, CO 80401, hereinafter referred to as "Contractor."

### WITNESSETH

WHEREAS, JCDHE is interested in contracting with a professional to provide public health integrated mosquito management services for the purpose of preventing and controlling mosquito-borne diseases such as West Nile Virus and West Equine Encephalomyelitis; and

WHEREAS, the Contractor desires to provide those services to JCDHE,

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, the parties hereto covenant and agree as follows:

#### 1. TERM

This Agreement shall be in effect for the period April 17, 2007 through December 31, 2007.

#### 2. RESPONSIBILITIES

These are defined in the Integrated Mosquito Management Program, Jefferson County, Colorado, Scope of Work, General Description and Specifications (Eight pages plus Attachments A,B, and C) that are attached as Exhibit A.

#### 3. COMPENSATION AND PAYMENT

- a. JCDHE will reimburse the Contractor a total of \$213,226 in 5 equal monthly payments starting in June, 2006. Contractor services will be documented and approved prior to authorization for payment. The final or fifth payment will be made after the completion and approval of all contract requirements.
- b. Contractor shall submit a monthly invoice to JCDHE by the 5<sup>th</sup> of the following month of service. Failure to submit billing information in a timely manner and correct format shall result in non-payment of invoice.
- c. Contractor shall be reimbursed within fourteen (14) days after receipt and approval of the invoice.

#### 4. CONFIDENTIALITY

- a. In performing services under the terms and conditions of this Agreement, Contractor agrees to comply with all JCDHE confidentiality requirements. Contractor must sign and return the Statement of Confidentiality, attached as Exhibit B, with the Purchase of Services Agreement.

5. INDEPENDENT CONTRACTOR STATUS, PAYMENT OF TAXES AND INSURANCE COVERAGE

- a. In performing services under this Agreement the Contractor is acting as an independent contractor and not as an agent or employee of JCDHE.
- b. As an independent contractor, the Contractor is solely liable and responsible for maintaining worker's compensation insurance which complies with statutory requirements in the State of Colorado, unemployment insurance benefits, and the withholding and payment of any and all federal, state and local taxes applicable to the receipt of funds or other consideration by the Contractor under the terms of this Agreement.

6. INDEMNIFICATION

- a. Contractor hereby indemnifies and holds JCDHE and the municipalities in Jefferson County harmless from all claims, damages, loss, injury, cost and expense, including attorneys' fees resulting from or related to any negligent or intentional acts or omissions of the Contractor, its agents, employees, subcontractors and consultants, in its performance of this Agreement. This provision shall survive the termination of this Agreement.

7. INSURANCE

- a. In performing services under this Agreement, the Contractor shall submit a certificate of insurance to JCDHE establishing the Contractor has professional liability insurance provided by an insurance carrier licensed to do business in the State of Colorado and meets or exceeds JCDHE minimum insurance requirements.

8. NON ASSIGNMENT

- a. Neither this Agreement nor any interest therein, or any claim thereunder, shall be assigned by the Contractor to any third person without the prior written consent of JCDHE.

9. OFFICIALS NOT TO BENEFIT

- a. No elected or employed member of JCDHE shall directly or indirectly receive or be paid any share or part of this Agreement or any benefit that may arise thereof. The Contractor warrants that it has not retained any company or person (other than a bona fide employee working solely for the Contractor) to solicit or secure this Agreement, and that the Contractor has not paid or agreed to pay to any company or person, (other than a bona fide employee working for the Contractor), any fee, commission, percentage, brokerage fee, gift or any other consideration contingent upon or resulting from the award of this Agreement to the Contractor. Upon learning of any breach or violation of this provision, JCDHE shall have the right to terminate this Agreement with no further liability or obligation for payment.



10. EMPLOYMENT OPPORTUNITY USE OF COLORADO LABOR, ILLEGAL ALIENS

- a. The Contractor shall not refuse to hire, discharge, promote, demote or discriminate in matters of compensation against any person otherwise qualified, solely because of race, creed, sex, color, national origin or ancestry, disability or age. The Contractor shall not knowingly employ unauthorized aliens to perform any portion of the Agreement and shall comply with the provisions of the Immigration Reform and Control Act of 1986.

11. NON-APPROPRIATION

- a. The payment of JCDHE's obligations hereunder in the fiscal years subsequent to the Agreement period are contingent upon funds for this Agreement being appropriated and budgeted. If funds for this Agreement are not appropriated and budgeted in any year subsequent to the fiscal year of the execution of this Agreement, this Agreement shall terminate. JCDHE's fiscal year is the calendar year.

12. STATUTES, REGULATIONS AND ORDINANCES

- a. The Contractor shall observe and comply with federal, state and local laws, regulations, rules or ordinances that affect those employed or engaged by it, the materials or equipment used or the performance of the project and shall procure any and all necessary approvals, licenses and permits all at its own expense.

13. SEVERABILITY

- a. If any provision of this Agreement or the application thereof to any person or in any circumstance shall be unenforceable to any extent, the remainder of this Agreement and the application of such provision to other persons or in other circumstances shall not be effected thereby and shall be enforced to the greatest extent permitted by law.

14. ENTIRE AGREEMENT

This Agreement and Exhibits constitute the entire Agreement among the partners and all other and prior Agreements among the parties relating to such subject matter are hereby cancelled and superseded in their entireties. No variations, modifications or changes herein or hereof shall be binding upon any party hereto unless set forth in a document duly executed by such party.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of  
4/17/07 be effective as of 4/17/07.

JEFFERSON COUNTY DEPARTMENT  
OF HEALTH AND ENVIRONMENT

Cathy Corcoran

Cathy Corcoran, President  
Board of Health

ATTEST: Bonnie McNulty

By: Bonnie McNulty, Secretary  
Board of Health

CONTRACTOR

Ed Fleming

02-0695531  
SSN / EIN

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**  
**Service Agreement: SCOPE OF WORK**

**GENERAL DESCRIPTION AND SPECIFICATIONS**

**GENERAL DESCRIPTION**

The service provider shall conduct an Integrated Mosquito Management (IMM) Program for Jefferson County Department of Health and Environment (JDCHE) during the spring, summer and fall of 2007. This program will be designed and implemented to control the spread of the West Nile Virus (WNV) and other mosquito-borne diseases such as Western Equine Encephalitis (WEE) by reducing the number of disease causing mosquitoes.

The service provider shall employ established IMM principles and practices to reduce the numbers of disease causing mosquitoes in Jefferson County. These principles and practices include: identification and classification of mosquito breeding habitat, surveillance of adult and larval mosquitoes, larval mosquito control (application of larvicides, source reduction, and/or biologic controls), and public education and outreach. Adulticiding - the killing of adult mosquitoes through aerial sprays and fogging - is not anticipated but the service provider shall maintain the capabilities to implement, manage, and / or provide properly trained staff and supervisors to conduct adulticiding if requested by JCDHE to do so.

The service provider shall provide the following IMM services within the service area:

- A. Adult Mosquito Surveillance
- B. Larval Mosquito Surveillance and Control
- C. Public Education
- D. Reporting
- E. Record Keeping
- F. Adult Mosquito Control Service Coordination
- G. Department Employee Training
- H. Board of Health Appearances

The service provider shall follow all applicable and appropriate Federal, State, and Local rules and regulations such as EPA, OSHA, FIFRA and the like pertaining to the implementation of the IMM services provided by the service provider in this Scope of Work.

The service area is generally described as the "plains" area of Jefferson County Colorado and consists of approximately 153 square miles. Specific requirements pertaining to the service area, the services to be provided, term of the contract, and the work products are described in the Specifications section of this Scope of Work.

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

**SPECIFICATIONS**

**I. SERVICE AREA**

The service area is generally described as the "plains" area of Jefferson County bounded by Broomfield County on the north, Chatfield State Park on the south, Sheridan Boulevard on the east, and the Hogback on the west. The 2006 Integrated Mosquito Management Service Area Map (Attachment A) illustrates the service area and the known potential larval development (PLD) sites. A summary of the service area is provided in the table below.

<b><u>Area / Municipality</u></b>	<b><u>Square Miles</u></b>
Unincorporated Jefferson County	77.2
Edgewater	0.7
Lakeside	0.3
Littleton	0.6
Morrison	1.2
Mountain View	0.1
Golden	9.3
Wheat Ridge	9.5
Lakewood	26.7
Bow Mar	0.3
Arvada	27.5
Total Square Miles:	153.4

**II. SERVICES TO BE PROVIDED**

**A. Adult Mosquito Surveillance**

1. The service provider shall provide all supplies, equipment and personnel to operate and maintain:
  - a) Sixteen (16) CDC light traps at various sites selected with the concurrence of JCDHE within the service area. These traps shall be operated one night per week on the same day of the week for a period of 13 weeks from June 4, 2007 to August 31, 2007
  - b) Nine (9) gravid traps at sites selected with the concurrence of JCDHE within the service area. The gravid trap sites may or may not coincide with the CDC light trap sites identified in paragraph a) above. These traps shall be operated one night per week on the same day of the week for a period of 13 weeks from June 4, 2007 to August 31, 2007.

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

- c) Five (5) traps, included in paragraphs A, 1, a & b above, a second night each week during the period of June 25, 2007 through August 10, 2007 as part of the Mosquito Sentinel Program in accordance with state guidelines. The Mosquito Sentinel Program trap locations will be designated by JCDHE in collaboration with the service provider.
  2. If for any reason, such as inclement weather, any of the trap nights described in paragraph a, b, and/or c above is cancelled, the service provider shall notify JCDHE immediately. JCDHE may require the service provider to reschedule the cancelled trap night as conditions allow.
  3. After each trap night the service provider shall collect, identify, speciate, and count all trapped mosquitoes by methods recognized by CDC and/or the Colorado Department of Public Health and Environment (CDPHE) and report this information to JCDHE at least once per week.
  4. All mosquito trapping activities including the submission of mosquito pool specimens shall be conducted in accordance with the protocols established in the current CDPHE Mosquito Surveillance Plan. A copy of the CDPHE 2005 Mosquito Surveillance Plan and West Nile Virus Mosquito Testing 2007 Sentinel Zone Protocol are provided in Attachment B and C respectively. CDPHE updates or changes to these plans will provided by JCDHE to the service provider.
  5. The service provider shall assume all liability for the placement and operation of any and all equipment. JCDHE shall not be responsible for any lost, damaged or stolen traps and/or equipment.
  6. The service provider shall maintain a toll-free (in Colorado) telephone line and shall accept calls from the public reporting mosquito problems and/or standing, stagnant water in the service area that may indicate the presence of PLD sites. The service provider shall maintain a log of calls received and shall summarize call activity in weekly and annual reports.
- B. Larval Mosquito Surveillance and Control:** The primary and priority focus of larval control will be for those mosquitoes competent to transmit diseases such as WNV. All mosquito complaints shall be thoroughly investigated and larval control implemented based a balanced evaluation of risk associated with concurrent infestation with mosquitoes presenting a public health problem and impact on quality of life in the community.

**Initial Inspection of PLD Sites:** By June 21, 2007 the service provider shall conduct an initial inspection of all known PLD sites within the service area. At the end of the 2006 IMM season there were approximately 600 known PLD sites

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

contained in the 153.4 square mile service area. The 2007 IMM service area and known PLD sites are identified on the Jefferson County Integrated Mosquito Management Service Area Map (Attachment A).

The purpose of the initial PLD inspection is to classify each PLD site as "targeted" or "non-breeding". Targeted PLD sites are those sites which have the highest potential for mosquito breeding. The remaining sites shall be classified as non-breeding PLD sites or removed from the list of PLD sites if the site no longer has the potential to breed mosquitoes. Any new PLD sites identified during the initial inspection of PLD sites shall be added to the list of PLD sites and shall be classified as "targeted" or "non-breeding".

On or before June 30, 2007 the service provider shall provide an updated list, based on the previous end-of-season PLD inventory, of all PLD sites and their classification. The list shall include the service provider's recommendations for additions, deletions, and/or revisions to the list of PLD sites.

**1. Larval Mosquito Surveillance and Control:** Upon completion and/or commensurate with the initial inspection of designated PLD sites, the service provider shall commence the following routine PLD surveillance and larval control activities:

- a) Targeted sites shall be inspected at least once per week by visual observation and by dipping any standing water for mosquito larvae.
- b) Non-breeding sites shall be inspected based on changes in climactic conditions but at least once per month to determine if any changes have occurred that would warrant a re-evaluation of their status.
- c) Storm water structures shall be inspected based on environmental conditions that could promote the development of mosquito larva at such structures. Strategically located storm water structures (catch basins, detention ponds, storm water inlet boxes, and the like) shall be inspected at least once per week for the presence of mosquito larvae. The results of the storm water structure inspections shall be included in the weekly totals and year to date totals in the weekly reports.
- d) During the course of conducting IMM activities, identify any additional and/or new PLD sites by noting any areas of clogged ditches and streams, standing water, etc., and inspect and classify each additional and/or new PLD site as a targeted or non-breeding site. All additional and/or new PLD sites shall be mapped and recorded, regardless of their classification. Note such features as abandoned swimming pools, etc., which have the potential for supporting larval development, report these features to

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

JCDHE, and work with local code enforcement officials to locate, identify, and apply the appropriate IMM measures to these sites.

- e) If it is determined that any PLD site in a, b, c, and/or d above are producing *Culex* sp. or other potential arboviral vector mosquitoes, apply the appropriate, federally approved materials, such as but not limited to 180-day briquettes, 30-day residual pellets, granular larvicides, monomolecular oils, etc. and/or utilize other recognized methods of larval control such as source reduction.
- f) Use the most appropriate method for larvicide distribution, such as hand application, backpack broadcasters, All Terrain Vehicle (ATV), etc.
- g) Maintain Material Safety Data (MSD) sheets for all products used and provide such information upon request to employees, the public, and/or JCDHE.
- h) As appropriate, conduct and document post-treatment quality control inspections within 24 to 48 hours to assure the larvae population has been controlled. If larvae are found, a second application of control material shall be applied. These activities shall be included in the weekly activity reports.
- i) Develop a method to contact private property land owners and obtain permission to enter property to conduct IMM activities. Entry onto private property shall be by prior authorization of the owner/agent.
- j) Maintain real-time documentation of all PLD site surveillance and larval control activity and enter real-time data into a JCDHE approved electronic database. An electronic copy of the database shall be provided to JCDHE on or before November 1, 2007 and/or upon the request of JCDHE.

**C. Public Education**

1. The service provider shall maintain a public education website providing general information on WNV and WEE, including basic disease information, tips for personal protection, information for homeowners on standing water, aerial spraying information (if appropriate), phone numbers to call, links to other websites, etc.
2. The service provider shall coordinate with JCDHE to provide printed public education information relating to WNV and/or WEE for the topics referenced in paragraph 1, above.
3. In the event that adulticiding or aerial spraying is to be performed, the service provider shall notify all residents in the area to be sprayed who are registered

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

in the State of Colorado Pesticide Sensitive Registry. A minimum of 3 attempts shall be made to reach these persons prior to the spraying or application. The Ultra Low Volume (ULV) insecticide application will be shut off in front of and upwind from sensitive resident's properties. The service provider shall maintain MSD sheets for all products used and shall provide such information upon request to employees, the public, and/or JCDHE. If adulticide spraying is required the service provider shall collaborate with JCDHE to coordinate the delivery of these services.

**D. Record Keeping**

The service provider shall maintain all records and documents pertaining to the services provided under this contract for a period of 3-years. By December 1, 2007 and/or upon the request of JCDHE, the service provider shall provide JCDHE with copies of any and all records and documents pertaining to the services provided under this contract in an electronic and/or hard copy format approved by JCDHE.

**E. Reporting**

1. **Weekly Report:** The service provider shall provide a weekly summary report of IMM service activities. Weekly reports shall include but not limited to:
  - a) The total number of PLD site inspections and post-treatment quality control inspections performed and the number these inspections for each municipality and for the unincorporated area of the County.
  - b) The number of larvicide applications, including products used and methods of dispersal.
  - c) The number of mosquitoes caught in light and gravid trapping, including the number of the various Culex or other arboviral vector species.
  - d) The number of inspectors used and the amount of time spent conducting contract work, reported as larval inspection time, mosquito trapping time, and office or support time.
  - e) The number of complaints received, areas inspected because of those complaints, the findings of each inspection and actions taken.
2. **Annual Report:** By December 1, 2007 the service provider shall provide an annual report to JCDHE regarding all IMM service activities performed under this contract. The annual report shall be provided in a format acceptable to JCDHE both electronically and in hard copy (5 copies) and shall include but not limited to:
  - a) surveillance activities and findings,



**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**  
**Service Agreement: SCOPE OF WORK**

- b) total hours logged for each service activity by the service provider and its employees,
- c) total number of PLD sites inspected, total number of sites treated, total number of mosquito trap nights, etc.
- d) an end of season map that illustrates the PLD sites identified and inspected during the contract season,
- e) the GIS shape files or other electronic files used to create the PLD site map,
- f) a complete list of all PLD sites and their classification. The PLD list shall include the service provider's recommendations for additions, deletions, and/or revisions to the list of PLD sites.

**F. Adult Mosquito Control Program Development and Coordination:** In the event of a Public Health Emergency, the service provider shall assist JCDHE in the development of timely adult mosquito control programs, such as ground and/or aerial adulticide spraying. Adult mosquito control programs shall be conducted accordance with all state and federal requirements. The cost of this service and adult mosquito control programs are not included in this contract.

**G. Department Employee Training:** Upon request the service provider shall provide up to four (4) hours of training for Department employees.

**H. Board of Health Appearances:** Upon request the service provider shall appear before the Jefferson County Board of Health to provide updates and/or a year-end report on contract activities. Up to six Board of Health appearances may be requested by JCDHE.

**III. TERM OF SERVICE AGREEMENT**

The Service Agreement shall be in effect for the period beginning April 17, 2007 through December 31, 2007. All field service activities shall commence no later than June 1, 2007 and shall continue until JCDHE determines that a specific field service is no longer needed, but no later than September 30, 2007.

**IV. WORK PRODUCTS**

Any and all maps, reports, spreadsheets, databases, geographical information system (GIS) files, newsletters and other hard copy or electronic documents generated by the service provider in fulfillment of its obligations under this contract shall be the property of JCDHE, who shall have sole and complete discretion regarding their use and distribution. All work products shall be delivered to JCDHE in a mutually agreed upon hardcopy and/or electronic format suitable for including in reports and folders. The data

**EXHIBIT A**  
**JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT**  
**2007 INTEGRATED MOSQUITO MANAGEMENT SERVICES**

**Service Agreement: SCOPE OF WORK**

and weekly reports will be furnished in standard 8 ½ by 11 inch paper. All reports will include the activity undertaken in each of the cities in the County. Delivery of the principal work products shall be provided according to the following delivery schedule.

**Work Product Delivery Schedule**

<b>Work Product</b>	<b>Delivery Date</b>
Begin Larval Mosquito Surveillance and Control	June 1, 2007
Begin Adult Mosquito Surveillance	June 4, 2007
First Weekly Report	June 8, 2007
Complete Initial Inspection of PLD Sites	June 21, 2007
Provide updated list of PLD sites and their classification	June 30, 2007
End Adult Mosquito Surveillance	August 31, 2007
End Larval Mosquito Surveillance and Control	September 30, 2007
Last Weekly Report	October 5, 2007
Electronic database of larval surveillance and control activities	November 1, 2007
Copy of records and documents pertaining to 2007 IMM services under this contract	December 1, 2007
First draft Annual Report	December 1, 2007
Final draft Annual Report	December 31, 2007

**ACRONYMS**

**Acronym Definition**

CDC	Centers for Disease Control and Prevention
CDPHE	Colorado Department of Public Health and Environment and its employees
GIS	Geographical Information Systems
IMM	Integrated Mosquito Management
JCDHE	Jefferson County Department of Health and Environment and its employees
MSD	Material Safety Data
PLD	Potential Larval Development
WEE	Western Equine Encephalitis
WNV	West Nile Virus

Attachment A: Jefferson County IMM Program Service Area Map

Attachment B: CDPHE 2005 Mosquito Surveillance Plan

Attachment C: CDPHE West Nile Virus Mosquito Testing 2007 Sentinel Zone Protocol

# 2006 Integrated Mosquito Management Service Area Map

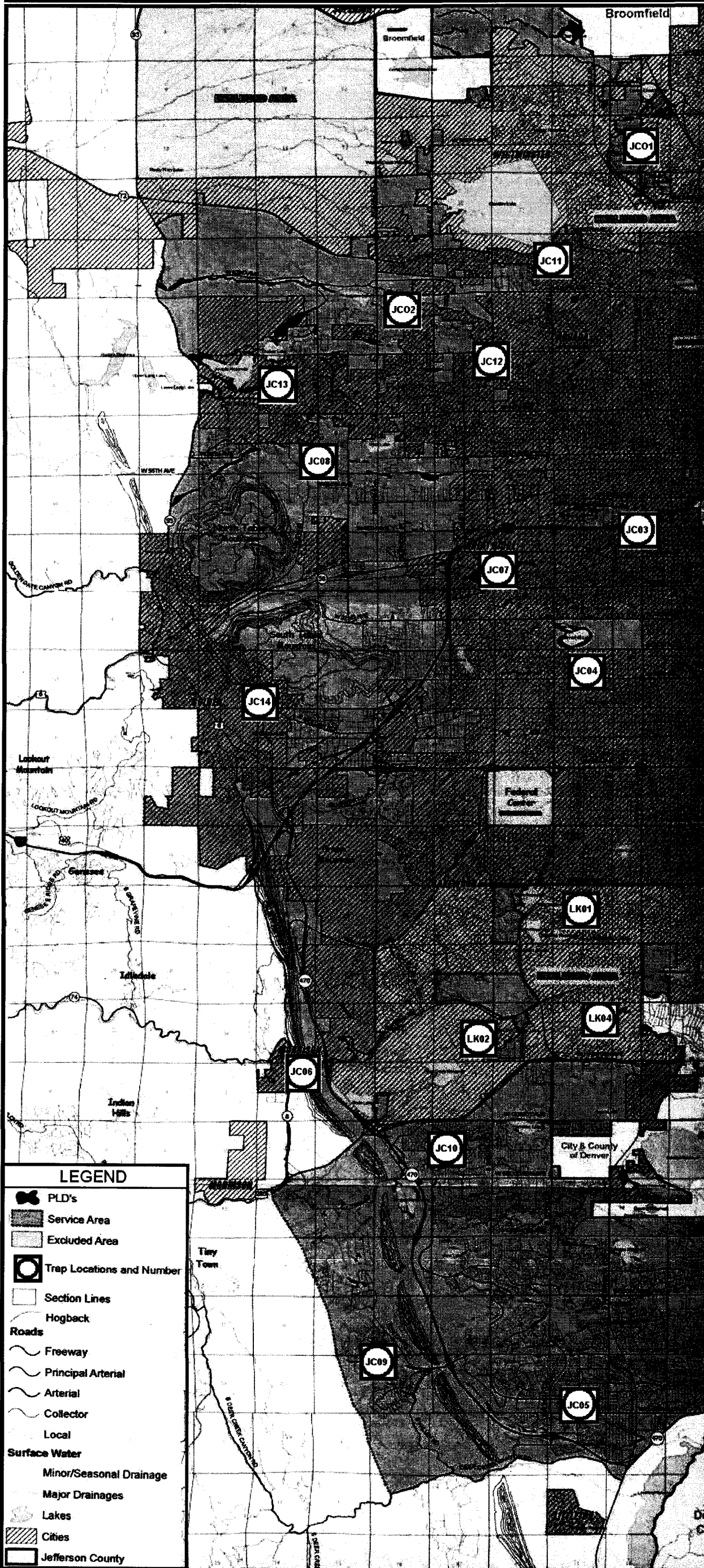


Figure: # 1  
 Figure Title: 2006 Service Area Map  
 Project: Jefferson County IMM Program



**OtterTail**  
 Environmental

## Attachment B



Colorado Department  
of Public Health  
and Environment

# 2005 Mosquito Surveillance Plan

3/23/05

## A. Introduction:

Mosquito trapping and testing data provide both qualitative and quantitative information on arbovirus activity and potential human risk in an area. Advances in testing mosquito pools and calculation of minimum infection rates allow an integrated system based on mosquito surveillance to comprise a large part of the arbovirus surveillance strategy. Testing will focus on *Culex* species of mosquitoes, as these are the primary human vectors.

## B. Plan Description:

Mosquito testing this season will remain essentially unchanged from 2004. It will again have a three-tiered approach utilizing, once again, *sentinel*, *floater*, and *permanent* mosquito trap sites. *Sentinel* sites (see attached *Mosquito Sentinel Site Guidelines*) will act as a longitudinal system to replace chicken flocks, provide population data based on a consistent trapping protocol, and allow testing for the three arboviruses present in Colorado (Western equine, St Louis, and West Nile). *Permanent* traps are the long-term mosquito trap sites that local surveillance / control operations maintain at their own discretion, above and beyond the sentinel sites agreed to by CDPHE. *Floater* traps are those that are deployed based on current surveillance data such as positive birds and horses or human cases to provide local risk assessment, and to support local control and prevention decisions.

### Sentinel Traps

Unlike sentinel chicken flocks, whose sole purpose as a surveillance tool was to detect the presence of mosquito borne viruses, mosquito sentinel sites will also provide temporal mosquito population data, species make-up, and infection rate data. In addition, the long-term baseline data that will be collected, using a standardized trapping and testing protocol, can be used to accurately compare year-to-year changes in mosquito populations. It is hoped that this approach can be sustained and provide a long-term surveillance system for arbovirus activity into the future.

Mosquitoes will be collected at the sentinel sites weekly and all pools of *Culex* species will be tested for WNV using RT-PCR. A sample of submitted pools will also be tested for Western Equine Encephalitis (WEE) and St. Louis Encephalitis (SLE) viruses. This will permit accurate mosquito infection rates to be calculated. The number of sentinel mosquito trap sites will increase slightly (21 sites) from last season (15 sites) to upgrade the level of coverage across the state. As was the case last season, the selection of *sentinel* sites will

## Attachment B

be determined by geographic location and the willingness of the local health agency, MAD, etc. to assume the responsibilities of maintaining a site during this and subsequent years.

### Floater Mosquito Traps

"Floater" mosquito trap testing will integrate the qualitative virus data collected from dead birds, horse and human cases with the quantitative data mosquito trapping can provide. Local agencies will decide the need for trapping in their area, which should be driven by positive virus findings using other surveillance tools (positive dead birds or horses). These trap site locations are expected to change from year to year based on local surveillance needs.

### Permanent Mosquito Traps

The third category of mosquito trapping includes *permanent* mosquito trap sites that local organizations and agencies operate and maintain, usually to monitor nuisance mosquito populations. The testing of *Culex* pools collected from these traps depends largely upon the conditions that exist at that site. Sampling and testing criteria will be discussed below (see C. 3. c. *Mosquito testing criteria*).

### **Surveillance Dates to Remember**

Dead bird and mosquito surveillance activities will commence **May 1<sup>st</sup>**. Initial testing will focus on dead birds as they will be a more sensitive indicator of virus activity early in the season when mosquito populations and infection rates are low. Once virus is detected in an area, mosquito testing should be used to assess the level of risk for human transmission. Dead bird testing should be limited to no more than two or three WNV+ birds from the same area (i.e., approx. 5 mi<sup>2</sup> area or 1.25 mi. radius). Further bird testing does not provide additional information and expends limited lab resources. **Unlike last season however, corvid bird specimens meeting sampling criteria will be accepted beyond the July 1<sup>st</sup> deadline date for bird testing if no other WNV + birds or other surveillance tool indicates virus activity in that area.**

All *Culex* spp. mosquito pools from **sentinel** trap sites will be tested using RT-PCR at the CDPHE/LSD lab in Denver. However, mosquito pools from **sentinel** traps in Moffat, Mesa, and Delta counties will be sent to and tested at the regional laboratory in Grand Junction.

**Prior to July 1<sup>st</sup>**, *Culex* mosquito pools from *floater* and *permanent* traps should be tested at the CDPHE Laboratory Services Division (LSD) using RT-PCR because of its greater sensitivity.

**Zone Trapping:** During this early trapping period (May 1<sup>st</sup> to July 1<sup>st</sup>), in an effort to stretch diagnostic resources, surveillance participants are strongly encouraged to "zone" trap their **floater** and **permanent** trap captures. That is, co-mingle, by species, *Culex* mosquito captures from several floater or permanent traps in a general geographic area to increase the size of pools being tested. Because early season *Culex* numbers are not expected to be very high until later in the season, pooling captures from several traps will reduce the number of small mosquito pools that use the same test as would a pool of 50

## Attachment B

be determined by geographic location and the willingness of the local health agency, MAD, etc. to assume the responsibilities of maintaining a site during this and subsequent years.

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All Culex spp. mosquito pools from **sentinel** trap sites will be tested using RT-PCR at the CDPHE/LSD lab in Denver. However, mosquito pools from **sentinel** traps in Moffat, Mesa, and Delta counties will be sent to and tested at the regional laboratory in Grand Junction.

**Prior to July 1<sup>st</sup>**, Culex mosquito pools from *floater and permanent* traps should be tested at the CDPHE Laboratory Services Division (LSD) using RT-PCR because of its greater sensitivity.

**Zone Trapping:** During this early trapping period (May 1<sup>st</sup> to July 1<sup>st</sup>), in an effort to stretch diagnostic resources, surveillance participants are strongly encouraged to "zone" trap their **floater** and **permanent** trap captures. That is, co-mingle, by species, Culex mosquito captures from several floater or permanent traps in a general geographic area to increase the size of pools being tested. Because early season Culex numbers are not expected to be very high until later in the season, pooling captures from several traps will reduce the number of small mosquito pools that use the same test as would a pool of 50

## Attachment B

mosquitoes. If a positive, co-mingled pool is detected, subsequent collections specific to a trap may be submitted in order to determine which trap the positive pool came from.

**After July 1<sup>st</sup>**, when expanding *Culex* mosquito populations and increasing infection rates should offset the lower sensitivity of VecTest®, mosquitoes from these floater and permanent traps will be tested by VecTest® at the six regional laboratories. If WEE or SLE activity is observed, regional labs will be provided with multi-antigen VecTest® kits valid for all three viruses.

Participants in the surveillance program are encouraged to use limited mosquito testing resources responsibly. At this time there will be no testing quota assigned to each county. Depending on the intensity of virus activity that is detected, the risk of human exposure, planned control efforts, etc., diagnostic resources may be diverted to where they are needed most. Regional epidemiologists and CDPHE will be monitoring diagnostic resource usage, suggesting where testing is needed and curtailing usage when it's appropriate based on virus activity and the resources that are available for that region or county.

### C. Plan Criteria:

#### 1. Sentinel Mosquito Trap Sites:

##### a. Obligations:

- 1) Trapping Schedule: weekly from early May through September. In 2005, it is recommended that a trapping frequency of one night per week be observed, adding additional nights if needed due to inclement weather.
- 2) Each site will consist of 2 CDC CO<sup>2</sup> baited, light traps and one gravid trap.
- 3) Traps shall be properly maintained and baited appropriately (i.e., dry ice for light traps and straw-manure infusion for gravid traps). See "Mosquito Trapping and Handling Protocol" dated 4/29/04.
- 4) Accurate records maintained (date, # trap nights, # mosquitoes by species, *Culex* population density, weather conditions, etc.)
- 5) **Weekly** submission of *Culex* mosquito pools and data to LSD in Denver or if the pools are from Mesa, Delta, and Moffat counties, pools should be sent to the regional lab in Grand Junction.
- 6) Calculation of Infection Rates

##### b. Site considerations:

- 1) Care should be used in selecting a sentinel trap site so they do not have to be moved to insure continuity of data. Site should be stable and easily accessible.
- 2) Site has a history of significant *Culex* mosquito activity and close proximity to appropriate *Culex* breeding habitat
- 3) Close proximity to human populations
- 4) Availability of resting sites and protection from wind (e.g., culverts, fences, shrubbery, trees, sheds, etc.)
- 5) Away from competing sources of light (light traps) or oviposition sites (gravid traps).
- 6) Avoid areas where heavy, regular adult mosquito and/or insect control are performed.
- 7) History of past arbovirus activity.

Note: "Sentinel" trap sites should remain at the same site each season; however, traps can be moved within a general area (< 0.5 mile) of similar habitat in order

## Attachment B

to improve trap performance and are not required to hang from the same tree week after week.

- c. Mosquito pooling suggestions:
  - 1) Sorted Culex mosquitoes of the same species from the two light traps can be co-mingled into common pools.
  - 2) Sorted mosquitoes from the gravid traps **cannot** be co-mingled with the same species from light traps. They must remain segregated in separate pools.  
Note: to calculate mosquito population density, take the total number of captured mosquitoes, by species, and divide by the number of trap nights.

### 2. Floater Mosquito Traps

- a. Location preferences: same as above, except that a confirmed, infected dead bird, horse, and/or human case has been reported in the area.
- b. Deployment considerations:
  - 1) Surveillance data will be used to support mosquito control activities.
  - 2) Trap(s) deployed for a minimum of two (2) weeks.
  - 3) Trap(s) operated a minimum of one night per week, adjusted to allow for inclement weather.
  - 4) Traps properly maintained and baited appropriately.
  - 5) Mosquito captures sorted and pooled. Culex species submitted to the appropriate regional lab or LSD lab for testing.
- c. Obligations:
  - 1) Trap data (e.g., trap nights, species, #'s, dates, Culex population density, weather conditions, etc.) maintained.
  - 2) Calculation of Infection Rates
  - 3) "**Zone Trapping**" see above.

### 3. Permanent Mosquito Traps

- a. Location preferences: same as those described for *sentinel* and *floater* traps.
- b. Deployment considerations: the selected location has a history of trapping at that site.
- c. Mosquito testing criteria:
  - 1) Many permanent traps have an established history and have collected an abundance of mosquito data over the years, but often have been deployed as a result of nuisance mosquito monitoring as opposed to arbovirus activity in which case, nuisance mosquito species will not be tested at this time
  - 2) Culex mosquitoes from permanent traps should be tested if the site is within 1.25 mi. of a WNV+ bird, horse or human case, a sustained increase in the Culex mosquito population is noted, and/or the site provides the only arbovirus surveillance data for that area.
- c. Obligations:
  - 1) Trap data (e.g., trap nights, spp. #'s, dates, Culex population density, weather conditions, etc.) maintained.
  - 2) Calculation of Infection Rates
  - 3) "**Zone Trapping**" see above.





Colorado Department  
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## Attachment C

# West Nile Virus Mosquito Testing 2007 SENTINEL ZONE PROTOCOL

### Sentinel Zone Concept

The goal of surveillance for mosquito-borne viruses (WNV, SLE, WEE) is to determine the human transmission risk in order to implement control and prevention strategies. To facilitate a standardized method of data collection and insure continued operation during anticipated budget reductions, the mosquito sentinel site concept was launched in 2004. Although these sites have, in general, accurately assessed West Nile Virus (WNV) activity in the region some problems have been identified. Specifically there was concern that a single site provided a poor representation of the region's mosquito populations and, more importantly, a single site was vulnerable to environmental changes that could reduce its effectiveness.

To address the problems associated with a single trap location, the sentinel site concept is being modified into a "Sentinel Zone" approach. Within a defined "sentinel zone" mosquito traps are set in strategic locations to ensure successful trapping of adequate numbers of mosquitoes throughout the WNV season. If one trap or site becomes inoperable, mosquitoes from other traps in the zone can still be tested and the poor trap site can be relocated to another location within the zone.

Following standardized trapping and testing protocols, a sentinel zone would provide data about mosquito population density, species make-up and arboviral activity that is comparable over the years. Furthermore, this approach will provide sufficient mosquito testing volume for calculating accurate infection rates to allow control decisions to be made (i.e. to spray or not to spray) in time to have a public health benefit. All Culex species mosquitoes collected in the sentinel zones will be tested for WNV by RT-PCR and a sample of the submitted pools will also be tested for Western equine encephalitis (WEE) and St. Louis encephalitis (SLE).

### Scope of Work

- 1) Defining a zone: Local agencies can determine where a zone will be located and what geographic area it will encompass within the following parameters:
  - ◇ A zone will be a circle with a minimum radius of 1.5 miles and a maximum radius of 5 miles
  - ◇ The center point of the circle will be used as the geo reference point for the zone (latitude/longitude).
- 2) Trap placement: Each zone will consist of five CO<sub>2</sub> baited light traps. Local agencies can determine where within the zone these traps are located.
  - ◇ Gravid traps or additional light traps can be maintained in the zone, however mosquitoes from other traps cannot be combined with the five zone traps for either testing or calculation of infection rates.
  - ◇ The same location for each trap must be used throughout a season. However, when necessary a non-producing trap can be moved to another location within the zone although this should be minimized and occur early in the season.



Colorado Department  
of Public Health  
and Environment

## Attachment C

- 3) Trapping schedule: To better reflect the WNV transmission season in Colorado AND ensure the majority of samples ( $\geq 60\%$ ) are tested during the peak of the transmission season the following schedule will be used. This schedule will result in a total of 100 trap/nights per zone for the season. Agencies can decide which night of the week to use although the same day should be used each week when possible
  - ✧ Weeks of June 4<sup>th</sup> through June 18<sup>th</sup>, 2007 – trap one night per week
  - ✧ Weeks of June 25<sup>th</sup> through August 6<sup>th</sup>, 2007 – trap two nights per week
  - ✧ Weeks of August 13<sup>th</sup> through August 27<sup>th</sup>, 2007 – trap one night per week
  
- 4) Mosquito Submission: The 5 traps within the sentinel zone could be viewed as one large mosquito trap from which the pooled infection rate and vector index will be calculated to assess human risk.
  - ✧ All female *Culex* mosquitoes trapped in a sentinel zone must be submitted to the state lab.
  - ✧ Submit mosquitoes in separate pools by *Cx. tarsalis* and other *Culex* (i.e. *Cx. pipiens*, *Cx. erythrothorax*, *Cx. resturans* combined).
  - ✧ Pool size can be up to 65 mosquitoes per vial.
    - CRITICAL -- the exact number of mosquitoes per vial must be recorded as this affects the infection rate calculations.
  - ✧ *Culex* mosquitoes captured in the 5 zone traps and the captures from the 2 nights per week during the peak of the trapping period should be co-mingled into the minimum number of pools. This will extend limited testing resources.
  
- 5) Data Maintenance: Accurate records of trapping results must be maintained to allow year-to-year comparisons and monitor trends in mosquito populations. Dramatic changes in *Culex* numbers or proportions can provide an early indication of increasing human risk.
  - ✧ It is **strongly** recommended that all mosquitoes in the traps be identified to species and that population data be maintained for all species.
  - ✧ At a minimum, data to maintain should include: trapping dates, # mosquitoes in the zone traps, *Culex* population density by species (*Cx tarsalis* and other *Culex* at a minimum), and weather conditions on night of mosquito trapping.
  - ✧ At the end of the season, a file with the sentinel zone data for the entire season (preferably in electronic format) must be sent to CDPHE.
  
- 6) Other Considerations:
  - ✧ Sentinel zones should contain areas that are suitable for *Culex* mosquitoes to breed and are in close proximity to human populations.
  - ✧ Sentinel zone traps should not be located in an area with regular, heavy spraying operations for adult mosquito or other arthropod control (orchards or agriculture areas). Areas with ongoing larviciding are OK.
  - ✧ Traps within a zone should have an availability of mosquito resting sites and protection from wind (i.e. culverts, fences, shrubbery, trees, sheds, etc) and should be placed away from competing sources of light and carbon dioxide (e.g., a stockyard).
  - ✧ Traps should be placed on the leeward side of obstacles if possible. For example, if the prevailing wind is generally from the west just after dusk, try to place the trap on the east side of trees, sheds, etc.

JEFFERSON COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT

STATEMENT OF CONFIDENTIALITY

Clients of JCDHE have the right to protection of their personal and confidential information. This protection is required of all staff, business associates, independent contractors, students, volunteers, and any other individuals that access paper and electronic records. State statutes and Federal regulations require this protection by the department and individuals.

Appropriate and proper uses and disclosures of protected health information are described in the department's Policy 5 and the Notice of Privacy Practices. Every individual in the department that has access to protected health information is responsible for the proper use and disclosure of this information. (See the Health Insurance Portability and Accountability Act of 1996, 42 U.S.C., regulations at 45 C.F. R. Parts 160 and 164.)

Specific state statutes and Federal laws govern the use and disclosure of information about clients enrolled in our alcohol and substance abuse programs. (See 42 U.S.C. 290dd-3 & 42 U.S.C. 290ee-3 and 42 CFR Part 2 for law and regulations.) Violation of these laws and regulations is a crime and will be reported.

*I understand that violation of the department's privacy practices and policies is punishable by the county disciplinary policy and various state and Federal laws. I will not use or disclose any protected health information in violation of these policies, laws and regulations. I have received a copy of the department's Privacy Policy and the Notice of Privacy Practices.*

Ed Fleming 4-30-07  
 Staff / Business Associate / Independent Contractor / Student / Volunteer Signature Date

Ed Fleming Otter Tail Environmental, Inc.  
 Print Name



# 2006 Integrated Mosquito Management Service Area Map

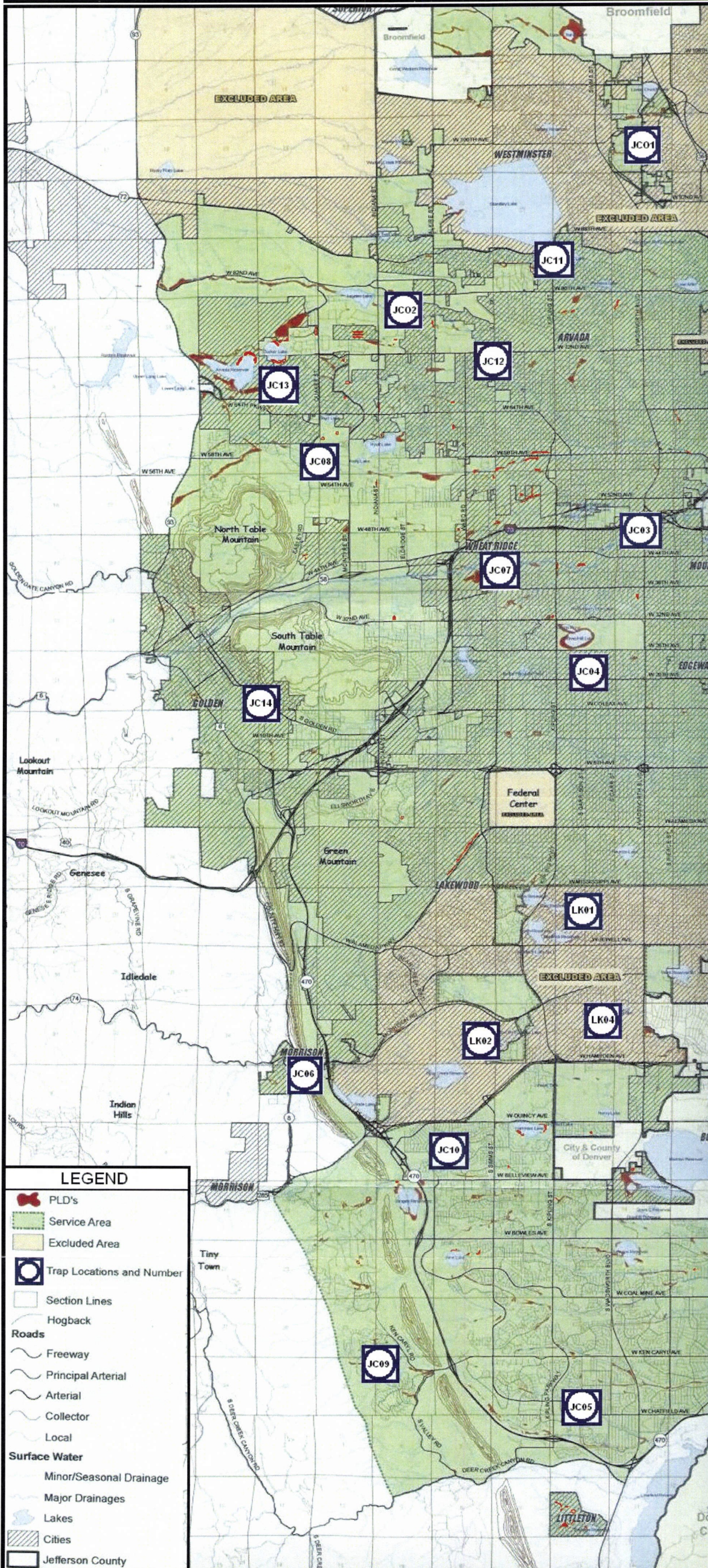
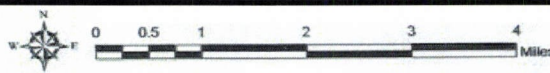


Figure: # 1  
 Figure Title: 2006 Service Area Map  
 Project: Jefferson County IMM Program



**OtterTail**  
 Environmental