# SPECIAL, 6/26/2017 1:30:00 PM

BE IT REMEMBERED that on June 26, 2017, there was begun and holden a SPECIAL session of the Commissioners Court of Jefferson County, Texas, with the following members and officers present and participating except those absent as indicated:

Honorable Jeff Branick, County Judge

Commissioner Eddie Arnold, Commissioner Pct. No. 1

Commissioner Brent Weaver, Commissioner Pct. No. 2

Commissioner Michael Sinegal, Commissioner Pct. No. 3

Commissioner Everette D. Alfred, Commissioner Pct. No. 4

Honorable Zena Stephens, Sheriff

Honorable Carolyn L. Guidry , County Clerk (ABSENT) -

Theresa Goodness, Chief Deputy

When the following proceedings were had and orders made, to-wit:

**Jeff R. Branick, County Judge**
**Eddie Arnold, Commissioner, Precinct One**
**Brent A. Weaver, Commissioner, Precinct Two**
**Michael S. Sinegal, Commissioner, Precinct Three**
**Everette "Bo" Alfred, Commissioner, Precinct Four**

# NOTICE OF MEETING AND AGENDA OF COMMISSIONERS' COURT OF JEFFERSON COUNTY, TEXAS June 26, 2017

Notice is hereby given that the Commissioners' Court of Jefferson County, Texas, willmeet at **1:30 PM,** on the **26th** day of **June 2017** at its regular meeting place in the Commissioners' Courtroom, 4th Floor, Jefferson County Courthouse, 1149 Pearl Street, Beaumont, Texas.

Said meeting will be a **Special** for the purpose of transacting the routine business of the County. Persons with disabilities requiring auxiliary aids for services who wish to attend this meeting should contact the County Judge's Office to arrange for assistance.

In addition to the routine business of the County, the subject of said meeting will be the following:

WORKSHOP:10:45a.m.- Discuss and review the products and services provided by the Texas Association of Counties Risk Management Pool.

## INVOCATION: Eddie Arnold, Commissioner, Precinct One

## PLEDGE OF ALLEGIANCE: Brent A. Weaver, Commissioner, Precinct Two

# PURCHASING:

1. Consider and approve, execute, receive and file contract for (RFP 17-013/YS), Operation and Installation of Shoe Shine Concession at Jefferson County Courthouse with Spurs Boot Shine.

**SEE ATTACHMENTS ON PAGES 8 - 13**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Weaver**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

2. Receive and file a sole source exemption pursuant to Local Government Code 262.024(7)(A) to purchase Scourge branded insecticides from ADAPCO, Inc. for Jefferson County Mosquito District.

**SEE ATTACHMENTS ON PAGES 14 - 40**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Weaver**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

3. Consider and approve award, execute, receive and file professional agreement (PROF 17-022/JW) with LJA Engineering, Inc., in the amount of $6,900.00, in accordance with (RFQ 16-005/JW), Engineering Services for Re-Bid Jefferson County Sheriff's Department Hangar Building at Jack Brooks Regional Airport. This project will be funded by 2015 Port Security Grant Funds.

**SEE ATTACHMENTS ON PAGES 41 - 41**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Weaver**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

4. Consider and approve, execute, receive and file professional agreement (PROF 17-023/JW), with Faust Engineering and Surveying, Inc. and Jefferson County Precinct No. 4 in the amount of $2,500.00, for surveying services for the creation of a County Assistance District.

**SEE ATTACHMENTS ON PAGES 42 - 42**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Weaver**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

# COUNTY AUDITOR:

5. Consider and approve budget transfer - Road & Bridge Pct.4 - additional cost for repairs, land survey, and travel.

| | | | |
|---|---|---|---|
| 114-0405-431-4018 | ROAD MACHINERY | $2,000.00 | |
| 114-0407-431-5027 | ARCHITECT & ENGINEER FEES | $1,500.00 | |
| 114-0407-431-5062 | TRAVEL EXPENSE | $1,500.00 | |
| 114-0402-431-3079 | CRUSHED STONE | | $5,000.00 |

**SEE ATTACHMENTS ON PAGES 43 - 43**

**Motion by: Commissioner Weaver**
**Second by: Commissioner Alfred**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

6. Consider and approve amendment of interlocal agreement with Port Arthur Independent School District for the Absent Student Assistance Project (ASAP) to be effective 07/01/2017.

**SEE ATTACHMENTS ON PAGES 44 - 48**

**Action: TABLED**

7. Consider and possibly adopt a Resolution recognizing Rebecca Jean Reynolds for her dedicated service to the Jefferson County Auditor's Office and to the citizens of Jefferson County and wishing her well in her retirement.

**SEE ATTACHMENTS ON PAGES 49 - 49**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Sinegal**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

8. Regular County Bills check #435013 through checks #435195.

**SEE ATTACHMENTS ON PAGES 50 - 57**

**Motion by: Commissioner Weaver**
**Second by: Commissioner Alfred**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

# COUNTY COMMISSIONERS:

9. Consider and approve Out of State Travel for the County Judge to attend the Gulf Coast BP Caucus Meeting at the NACO Conference in Columbus, OH July 21-22, 2017. All costs of the trip will be paid by Texas Association of Counties.

**Motion by: Commissioner Alfred**
**Second by: Commissioner Arnold**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

10. Receive and file executed Inter-local Agreement between Jefferson County, Texas and the South East Texas Regional Planning Commission allowing Jefferson County the use of the Swift reach 911 Emergency Alerting System.

**SEE ATTACHMENTS ON PAGES 58 - 64**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Arnold**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

11. Consider and possibly approve a Proclamation for the Port Neches-Groves 2017 5-A Baseball Championship.

**SEE ATTACHMENTS ON PAGES 65 - 66**

**Motion by: Commissioner Weaver**
**Second by: Commissioner Arnold**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

12. Consider, possibly approve, receive and file Annual Audit Report for Jefferson County Emergency Services District #4 pursuant to Section 775.082, Texas Health & Safety Code.

**SEE ATTACHMENTS ON PAGES 67 - 105**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Arnold**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

13. Receive and file Annual Road Reports of Jefferson County Commissioners of Precincts 1, 2, 3, and 4 pursuant to Section 251.005, Texas Transportation Code and file a copy of same with the Grand Jury.

**SEE ATTACHMENTS ON PAGES 106 - 112**

**Motion by: Commissioner Alfred**
**Second by: Commissioner Arnold**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

14. Consider and approve acceptance, Pursuant to Sec.81.032 of the Texas Local Government Code, of a donation to the Jacks Brooks Regional Airport Fire Department. Funds will be used to support the Airport Fire Department. The amount of the donation is $500.00.

**Motion by: Commissioner Alfred**
**Second by: Commissioner Arnold**
**In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
**Action: APPROVED**

15. Consider reappointments to the Spindletop Center Board of Trustees for a two-year term Mr. Frank Coffin, appointed by Commissioner Weaver and Ms. Rebecca Ford, appointed by Commissioner Arnold.

    **Motion by: Commissioner Alfred**
    **Second by: Commissioner Arnold**
    **In favor: County Judge Branick, Commissioner Arnold, Commissioner Weaver, Commissioner Sinegal, Commissioner Alfred**
    **Action: APPROVED**

PLEASE NOTE MONDAY, July 3, 2017 NO COMMISSIONERS' COURT MEETING.THE NEXT COURT MEETING WILL BE JULY 10, 2017.

**Other Business:**

Receive reports from Elected Officials and staff on matters of community interest without taking action.

***DISCUSSION ON ANY OTHER ITEM NOT ON AGENDA WITHOUT TAKING ACTION.

_____

**Jeff R. Branick**
**County Judge**

**STATE OF TEXAS** **CONTRACT NUMBER: 17-013/YS**
**COUNTY OF JEFFERSON** **OPERATION AND INSTALLATION OF SHOE SHINE CONCESSION**

**WHEREAS,** JEFFERSON COUNTY has determined there is a need to provide for Operation and Installation of Shoe Shine Concession at Jefferson County Courthouse; located at 1085 Pearl Street, Beaumont, TX.

**WHEREAS,** JEFFERSON COUNTY has requested and reviewed proposals for a Shoe Shine Concession Contractor in accordance with applicable Federal, State and local laws and ordinances regarding health, sanitation, and safety.

**WHEREAS,** JEFFERSON COUNTY has determined that Spurs Boot Shine can best provide Operation and Installation of Shoe Shine Concession at Jefferson County Courthouse located at 1149 Pearl, Beaumont, TX.

**WHEREAS,** this agreement is made between Spurs Boot Shine (hereinafter referred to as（CONTRACTOR) and the COUNTY OF JEFFERSON, TEXAS (hereinafter referred to as (COUNTY） acting by and through its duly authorized representative, Jefferson County Judge Jeff Branick.

**NOW THEREFORE,** the parties agree as follows:

## ARTICLE I
## RETENTION OF CONTRACTOR

COUNTY hereby retains CONTRACTOR as an independent contractor and not an employee for services more particularly described in this Agreement.

## ARTICLE II
## TERM OF AGREEMENT

Regardless of the date of execution, this Agreement shall become effective July 1, 2017 and continue in force until June 30, 2018 with the option to extend for four (4) additional one (1) year terms unless sooner terminated as provided herein. Should this Agreement naturally expire without alternative provisions, this agreement shall continue in force on a month-to-month basis under the same terms.

Due to the Constitutional debt limitation for Counties, any Agreement, which extends beyond the current fiscal year, is executed subject to future appropriations to fund its provision.

## ARTICLE III
## CREDENTIALING

CONTRACTOR shall select and assign specific personnel to provide services for COUNTY under this Agreement and shall provide COUNTY with current copies of all licensure,

credentialing, and insurance information as required by State law. All such information shall be provided at the time of execution of this Agreement.

## ARTICLE IV
## TERMINATION

The parties hereto understand and agree that after a good faith effort has been made toward the success and performance of the Agreement, if either party believes in its sole judgment that the Agreement cannot be successfully continued for any reason, either party may terminate the Agreement NINETY (90) calendar days from receipt of said notice. Thereafter, this Agreement shall terminate, become null and void, and be of no further force or effect.

This Agreement shall immediately and automatically terminate upon the occurrence of any one of the following:

1. Dissolution of CONTRACTOR.

2. CONTRACTOR abandons its duties in accordance with the provisions of Article V (Duties of Contractor).

3. Failure of CONTRACTOR to perform its responsibilities under this Agreement in the highest professional manner.

4. Any substantiated allegation of criminal wrongdoing on the part of CONTRACTOR, which would substantially interfere with the performance of the duties, set out herein.

5. Failure by CONTRACTOR to cure any default or breach under this Agreement within ten (10) days after receiving notice in writing.

6. Whenever CONTRACTOR and COUNTY mutually agree to termination in writing.

Upon termination of this agreement under any provision, CONTRACTOR shall be entitled to receive only the unpaid accrued compensation as of the date of termination minus any reasonable costs incurred by COUNTY to fulfill CONTRACTORS obligations under this Agreement.

## ARTICLE V
## DUTIES OF CONTRACTOR

CONTRACTOR shall be responsible for all duties specified in RFP Specification Number 17-013/YS, which by this reference is incorporated in full into this agreement, and include but are not limited to the following:

1. CONTRACTOR shall furnish Operation and Installation of Shoe Shine Concession in accordance with the Specifications of RFP 17-013/YS.

2. CONTRACTOR will bring in their own furnishings, equipment, and supplies and with

the understanding upon expiration of agreement equipment remains property of Spurs Boot Shine.

3. CONTRACTOR's hours of operation will be Monday – Thursday, 7:30a.m -3:30 pm for "as you wait" service, 3:30 p.m. – 5:00 p.m. for delivery service within the Jefferson County Courthouse. Service on Friday will be from 7:30 a.m. – noon, with no same day delivery service. Shoe shine concession will be closed all federal holidays and two weeks out of the year (the week of July 4th and the week falling between December 24th and January 2nd). When a holiday falls on a Thursday, the stand will reopen the following Monday.

4. CONTRACTOR will be responsible for all licenses and permits necessary to comply with all local, state, and federal mandates pertaining to the operation of a shoe shine concession.

5. CONTRACTOR shall make payments to COUNTY as specified in ARTICLE VII.

6. CONTRACTOR shall be responsible for all telephone, internet, or cable service required in the performance of this Agreement.

7. CONTRACTOR is responsible for all day-to-day as well as periodic major cleaning of the entire area assigned to CONTRACTOR.

8. CONTRACTOR and its employees assigned to COUNTY facilities are required to comply with all facility rules of conduct concerning normal day-to-day operations.

9. CONTRACTOR is required to staff the operation with the optimum number of employees at all times for the efficient operation of the shoe shine concession.

10. CONTRACTOR employees must be properly attired in a standard uniform.

11. CONTRACTOR employees are subject to background check and wear security identification while working in the County facilities.

12. CONTRACTOR employees are subject to search at any time while within secured areas of COUNTY facilities.

13. CONTRACTOR must obey all Federal, State and local laws and ordinances regarding health, sanitation, and safety. CONTRACTOR will be subject to inspections of the assigned area by authorized personnel from the Jefferson County Courthouse Superintendent of Maintenance.

14. CONTRACTOR may at a later date add or delete any County facilities with terms to be negotiated at that time.

## ARTICLE VI
## DUTIES OF COUNTY

COUNTY shall provide access to dumpsters and recycling containers at reasonable times to be negotiated between CONTRACTOR and Courthouse Superintendent of Maintenance.

COUNTY shall approve any and all designs, furnishings, decorations, alterations, improvements, advertisements, etc., prior to any such action being taken by the Contractor.

COUNTY will provide the shoeshine concession access to one electrical outlet. Contractor will be responsible for additional wiring or cables as approved by Jefferson County Maintenance.

COUNTY will maintain all building systems (HVAC, electrical, structural).

## ARTICLE VII
## RATES

CONTRACTOR shall pay directly to COUNTY Lease Payment $125.00 per month for the first six months of contract, increasing to $250.00 per month after the initial first six months through the end of the second year, to be negotiated prior to year three in accordance with CONTRACTOR'S response to RFP Number 17-013/YS, which with the RFP Specifications for RFP Number 17-013/YS are by this reference incorporated in full into this Agreement. Payments will be monthly installments by the 5th of each month.

## ARTICLE VIII
## RELATIONSHIP OF PARTIES

None of the provisions of this Agreement is intended to create nor shall be deemed or construed to create any relationship between the parties other than that of independent entities contracting with each other solely for affecting the provisions of this Agreement.

It is expressly acknowledged and agreed that neither of the parties, nor any of their employees shall be construed to be agent, employer or representative of the other nor shall any provision of this Agreement create any right in COUNTY to exercise control or direction over the business of CONTRACTOR provided, however, that all services provided to COUNTY hereunder shall be provided and delivered at all times in a manner consistent with the standards of CONTRACTORS profession, the terms of this Agreement and all applicable laws, rules and regulations of authorities having jurisdiction over Jefferson County.

Personnel provided by CONTRACTOR are not employees of COUNTY nor are they entitled to any direct compensation nor any benefits or rights of COUNTY employees as from time to time may be established, and shall provide services for the benefit of COUNTY through CONTRACTOR and only pursuant to this Agreement.

COUNTY has hired CONTRACTOR to provide shoe shine concession. As such, CONTRACTOR has the duty and obligation to perform all obligations to COUNTY under this

Agreement in the highest professional manner. No property owned by or referencing COUNTY or one of its subdivisions shall be used by any employee, staff member, or representative of CONTRACTOR without express approval by the authorized COUNTY representative and then shall be used only for professional purposes within the parameters of this Agreement.

## ARTICLE IX
## INSURANCE

CONTRACTOR, at no cost to COUNTY, shall have and maintain at all times insurance of the types and amounts required in the bid specifications.

## ARTICLE X
## INDEMNIFICATION

CONTRACTOR shall indemnify and hold COUNTY harmless from and against any and all claims, demands, costs, expenses, liabilities and losses (including reasonable attorneys fees) which may arise out of any acts or failure to act of CONTRACTOR, its employees, agents or contractors in connection with the performance of services pursuant to this Agreement.

## ARTICLE XI
## MISCELLANEOUS

This agreement, Specifications for RFP Number 17-013/YS, and CONTRACTOR'S response constitute the entire understanding between the parties, and no other agreements, representations or contract shall be binding on any of the parties unless set forth in writing and signed by all parties. Should the documents comprising this understanding contain conflicting provisions, provisions of the Bid Specifications shall have priority.

This Agreement supersedes all other prior agreements, either oral or written between the parties with respect to the professional services to be provided by CONTRACTOR to COUNTY and contains all of the covenants and agreements between the parties with respect to the rendering of such services in any manner.

Each party to this Agreement acknowledges that any party or anyone acting on behalf of any party that is not embodied in this Agreement has made no inducements or promises, oral or otherwise.

The invalidity or unenforceability of any term or provision of this Agreement shall in no way affect the validity or enforceability of any other term or provision**.**

Neither party under this Agreement shall have the right to assign or transfer its rights to any third party without prior written consent of the other party.

The law of the State of Texas hereunder, shall govern the validity of this Agreement and of any of its terms or provisions, as well as the rights and duties of the parties and all venues shall be in Jefferson County, Texas.

## ARTICLE XII
## NOTICES

All notice required under this Agreement shall be sent postage prepaid U.S. Mail or hand delivered to the parties at the following addresses:

CONTRACTOR:

COUNTY: Jefferson County Purchasing Department
Deborah L. Clark, County Purchasing Agent
1149 Pearl Street, 1st Floor
Beaumont, Texas 77701

**Signed** on this the 21st day of June 2017.

OWNER:

Jefferson County

BY: _____
Jeff R. Branick

TITLE: County Judge

CONTRACTOR:

Spurs Boot Shine

BY: Linda C Riggs
Linda C. Riggs

TITLE: Owner

ATTEST:

By _____, Chief Deputy
Carolyn L. Guidry
County Clerk

COMMISSIONERS COURT
JEFFERSON COUNTY, TEXAS

Bayer

January, 2017

To Whom It May Concern:

Bayer is the only manufacturer of Scourge® branded insecticides including Scourge 18-54 and Scourge 4-12 RTU.

ADAPCO, Inc. is the sole distributor for these Scourge brands of ULV products in the United States, Puerto Rico, and the Caribbean Islands

We appreciate your interest in Bayer Vector Control Products. If there are further questions, or if there is additional information that you need, please do not hesitate to call.

Respectfully,

Gordon Morrison
Vector Business Manager
Office 919-549-2535
Mobile 919-452-7145
Gordon.morrison@bayer.com

US005466458A

# United States Patent [19]

**Martin et al.**

[11] **Patent Number: 5,466,458**

[45] **Date of Patent: Nov. 14, 1995**

[54] **EMULSIFIED SPRAY FORMULATIONS**

[75] Inventors: **Robert Martin**; **George R. Cayley**, both of Hertfordshire, England; **Jonathan R. M. Thacker**, Paisley, Scotland; **Franklin R. Hall**, Wooster, Ohio; **Denise K. North**, Hertfordshire, England; **John M. Groome**, Hertfordshire, England; **David A. Jeffries**, Hertfordshire, England

[73] Assignee: **Roussel Uclaf**, France

[21] Appl. No.: **196,809**

[22] Filed: **Feb. 15, 1994**

**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 979,452, Nov. 20, 1992, abandoned, and Ser. No. 78,212, Jun. 17, 1993, abandoned, said Ser. No. 979,452, is a continuation of Ser. No. 845,804, Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 438,399, Dec. 27, 1989, abandoned.

[51] **Int. Cl.**[6] ..... **A01N 25/00**

[52] **U.S. Cl.** ..... **424/405**; 424/DIG. 8; 424/DIG. 10

[58] **Field of Search** ..... 424/405; 514/558, 514/389, 242, 86

[56] **References Cited**

U.S. PATENT DOCUMENTS

| | | | |
|---|---|---|---|
| 3,931,413 | 1/1976 | Frick et al. | 514/558 |
| 4,176,189 | 11/1979 | Itaya et al. | 514/389 |
| 4,308,258 | 12/1981 | Okabe et al. | 514/86 |
| 4,327,094 | 4/1982 | Mizutani et al. | 514/242 |
| 4,647,610 | 3/1987 | Sperry et al. | 524/377 |

FOREIGN PATENT DOCUMENTS

| | | |
|---|---|---|
| 0210747 | 2/1987 | European Pat. Off. . |
| 0331474 | 9/1989 | European Pat. Off. . |
| 1297607 | 12/1962 | Germany . |

OTHER PUBLICATIONS

K. Naumann, 1939 "Synthetic Pyrethroid Insecticides: Structures and properties" Springer–Verlag pp. 96–99.

"Kolos" Protection of Plants, No. 6, 1980, Ways of Increasing the Effectiveness of Pesticides.

*Primary Examiner*—Thurman K. Page
*Assistant Examiner*—William E. Benston, Jr.
*Attorney, Agent, or Firm*—Nixon & Vanderhye

[57] **ABSTRACT**

A formulation suitable for spraying or for dilution with water to form a sprayable preparation, the formulation comprising an active ingredient, optionally a carrier or solvent for the active ingredient, an emulsifier and an evaporation retardant where the formulation satisfies the following formula

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \mathrm{Exp}\left[\ln\left(\frac{L}{4}\right) + C\ln(AX^B)\right]$$

where L is less than or equal to 15, A=700376, B=–1.51, C=0.8472, $M_{oil}$ is the weighted average relative molar mass of the oil phase $M_{retardant}$ is the weighted average relative molar mass of the retardant, and X=($M_{oil}$) 1.8/Y, where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of the oil phase which will dissolve the retardant, divided by the number of moles of retardant, provided that, in the formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is extruded. The formulation may include a pesticide or herbicide. The action of the evaporation retardant is improved.

**25 Claims, No Drawings**

# EMULSIFIED SPRAY FORMULATIONS

This application is a continuation-in-part of earlier application Ser. No. 07/979,452 filed Nov. 20, 1992, abandoned, which is a continuation of Ser. No. 07/845,804 filed Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 07/438,399 filed Dec. 27, 1989, abandoned. This application is also a continuation-in-part of application Ser. No. 08/078,212 filed Jun. 17, 1993, abandoned.

The present invention relates to spray formulations, especially pesticidal formulations of the sort which may be diluted with water to form a sprayable preparation, for example a pressure pack ("aerosol") preparation or a spray, particularly an ultra low volume (ULV) spray for domestic, horticultural, agricultural, environmental or industrial use.

Water-based sprays are advantageous because they cost less than oil-based sprays and are often less toxic to mammals. However, particularly then the ambient temperature is high, the water in the spray droplets evaporates and the droplets become smaller and drift more readily from the area being sprayed. The size of the droplets is frequently specially chosen to suit the application, for example to maximise droplet adherence to flying insects or adherence to plant foliage, to increase bio-availability, or to control the size of the area being sprayed and the delivery rate per square metre; such care is pointless if the spray droplets change size, possibly unpredictably, following spraying.

GB-A-2 095 109 discloses improved water-dilutable formulations comprising a long-chain fatty alkanol which retards the evaporation of the water from the drops of the spray.

We have now found that still better evaporation retardation can be achieved if the formulation satisfies the following Formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \mathrm{Exp}\left[\frac{\ln\left(\frac{L}{4}\right) + C\ln(AX^B)}{C}\right]$$

where L is less than or equal to 15, A: 700376, B=−1.51, C=0.8472,

$M_{oil}$ is the weighted average relative molar mass of the oil phase,

$M_{retardant}$ is the average molar mass of the retardant, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of oil phase which will dissolve the retardant, divided by the number of moles of retardant,

provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded.

For the avoidance of doubt, and to clarify any ambiguities which may arise in the printing or copying of this specification, it is to be noted that the relational symbol in the Formula is "less than or equal to", "Exp" means the exponential of what follows in brackets, "ln" means the natural logarithm, i.e. $\log_e$, L is divided by 4, X is raised to the power B, B is a negative value (minus 1.51) and, in the definition of X, $M_{oil}$ is raised to the power 1.8.



The "oil phase" is the liquid non-aqueous phase and will comprise one or more of the active ingredient, the solvent therefor and the emulsifier.

Preferably L, which is related to the evaporation rate from the sprayed droplets, is less than 12, 10, or 8 and is most preferably less than 5. A distilled water spray has an "L" value of about 26, and most conventional diluted formulations have a value of about 22–30. In the formulations of the invention, "L" can be set at a desired value in order to calculate the required ratios of the ingredients. "L" can also be measured for a given formulation by the method described below.

The evaporation retardant may be any film-forming compound, preferably an alkanol. It is preferably a primary alcohol; preferably with no more than one or two side substitutions selected from methyl, ethyl, tri fluoromethyl and halo (e.g. fluoro or chloro), with such substitutions preferably remote from the alcohol group (preferably at least 7 carbon atoms away from the hydroxyl group), and preferably the alkanol is not substituted at all: preferably $C_{16-20}$; preferably saturated; and preferably a solid at 27° Octadecan-1-ol and, particularly, hexadecan-1-ol are preferred. Hexadecan-1-ol (also known as cetyl alcohol) is usually available commercially as a mixture with a minor proportion of octadecan-1-ol (stearyl alcohol) and such "cetostearyl alcohol" is quite satisfactory. Heptadecan-1-ol performs adequately but is much more expensive. Other highly effective film-forming agents include 1-hexadecylamine, 1-heptadecylamine and 1-octadecylamine. Less preferred film-forming agents include hexadecan-2-ol, 1,2-hexadecandiol, methyl stearate, stearyl acetate, methyl palmitate and 1,2-octadecandiol. N-alkoxyalkanols may be used, for example $CH_3(CH_2)_{21}OC_2H_4OH$, $CH_3(CH_2)_{21}OC_3H_6OH$, $CH_3(CH_2)_{17}OC_2H_4OH$ or $CH_3(CH_2)_{15}OC_2H_4OH$, as may oxyethylene-docosanol and mixtures of any of the said evaporation retardants.

The emulsifier may be any suitable compound or mixture of compounds. Cationic emulsifiers can be used, but they tend to irritate the users' eyes. Anionic emulsifiers such as calcium dodecyl benzene sulphate (CDBS) or sodium diisopropyl naphthalene sulphonate (SDNS) can also be used, but these are not as effective at stabilising the emulsion. Preferably, the emulsifier is a non-ionic compound, or mixture of non-ionic compounds, having an HLB (hydrophilic/lipophilic balance) of 8–18. Suitable compounds include polyoxyethylene stearyl ethers(PSE), polyoxyethylene monolaurates(PEM), polyoxyethylene mono-oleates (PMO), sorbitan mono-oleate (SMO), nonylphenol ethoxylate (NPE), polyethylene glycol (PEG) and blends of oleyl ethoxylate (10 mole) and PEG20 glyceryl oleate (OE/PGO).

These emulsifiers are available as follows:

| Abbrev | Trade name | Supplier |
|---|---|---|
| OE/PGO | Tegoplant EM11 | Th. Goldschmidt Ltd |
| PSE | Brij 72, Brij 76, Brij 78 | ICI Speciality Chemicals |
| PEM | Tween 20 | ICI Speciality Chemicals |
| SMO | Span 80 | ICI Speciality Chemicals |
| PMO | Tween 80 | ICI Speciality Chemicals |
| NPE | Ethylan KEO, 55, BV | Lankro Chemicals Limited |
| CDBS | Arylan CA | Lankro Chemicals Limited |

-continued

| Abbrev | Trade name | Supplier |
|---|---|---|
| SDN | Aerosol OS | Cyanamid GB Ltd |

The solvent, at least for an oil-soluble active ingredient, preferably has a low relative molecular mass, namely less than about 200. Suitable compounds include lower alkyl esters, lower ketones, lower alkanols and lower alkanes, the term "lower" meaning $C_{1-10}$, preferably $C_{1-8}$.

Particular solvents include the following, all available from Exxon Chemicals Limited.

"Solvesso 150"—An aromatic hydrocarbon solvent (C9 to C11) with a distillation range 190° to 210° C.

"Solvesso 200"—An aromatic hydrocarbon solvent (C10 to C12) with a distillation range 226° to 290° C.

"Exxate 700"—Heptyl acetate 99% pure, or Odourless kerosene—A mixture of high boiling non-aromatic hydrocarbons consisting of paraffins and naphthenes with a distillation range of 180° to 270° C.

The formulation may comprise more than one active ingredient (optionally with a synergist or potentiator, which is regarded as an active ingredient for the purpose of the Formula above), more than one solvent, more than one emulsifier and/or more than one retardant, together with other ingredients such as perfumes, dyes, anti-foam agents, solids (especially to form wettable powders) and thickeners. Some compounds, such as butane, propane and dichlorodifluoromethane and carbon dioxide are highly volatile and are used as propellants in pressure pack formations. Although sometimes acting as solvents for particular active ingredient, they almost instantly evaporate from the drops when sprayed and are thus excluded from the calculations in the Formula above. Such solvent/propellants are those which have no liquid phase at 27° C. at atmospheric pressure.

$M_{oil}$ the average molecular weight of the oil phase, is the weighted average, i.e. taking into account the relative proportions of the ingredients.

The value "Y", namely the molar solubility ratio of the formulation, may be derived empirically by making up at 40° C. a series of mixtures with different ratios of oil phase to alkanol, allowing the mixtures to cool to 27° C., leaving the cool mixtures for at least 48 hours at 27° C., and determining the amount, in moles, of the oil phase which is needed to dissolve completely a given amount of retardant, in moles. The former is then divided by the latter to give Y.

The formulations of the invention may be (i) single phase substantially anhydrous formulations, or (ii) emulsions comprising water. In a formulation of type (ii), some of the active ingredient, solvent or emulsifier components may partition into the aqueous phase, in which case such components are deemed not to be part of the oil phase in the Formula above. Examples of water-miscible solvents include ethanol, propanol, ethylene glycol and propylene glycol. It has been found that partially water-miscible components may be treated as being wholly water-miscible and hence excluded from the oil phase in the calculations.

When the formulation of the invention is diluted to give a sprayable preparation, the molar ratio of water to retardant should preferably not exceed about 9000, and preferably not exceed 8000, 7000 or 6000. It is perfectly possible to prepare a more dilute solution, but all that will happen is that the retardant will be unable to form a film over the entire surface of the droplets, and the water will evaporate until there is a sufficient concentration of the retardant to form a complete film which will then retard further evaporation. Thus, the droplet size is less controllable and, in addition, a larger volume of solution must be stored and pumped, which is inefficient.



The active ingredient may be an insecticide, acaricide, herbicide, fungicide, plant growth regulator, insect behaviour modifier, biological control agent (e.g. viruses, bacteria and eggs of parasites), dye, perfume, bactericide, lubricant, medicament, paint, polish, lacquer (including hair lacquer), textile treatment (including sizes), or any other compound to be sprayed in a water-based formulation. Sprays in accordance with the invention are particularly suitable for spraying buildings, residential or commercial areas and insect breeding grounds (such as swamps and other tracts of water) with insecticide and for spraying crops with herbicides, insecticides, fungicides and plant growth regulators.

Suitable pesticides including pyrethroids (such as permethrin, deltamethrin, cypermethrin (including alphamethrin, the allethrins, fenvalerate and cyfluthrin), organophosphates (such as ethion, chlorfenvinphos, chlorpyrifos (methyl) or coumaphos), carbamates, organochlorines (such as DDT, dieldrin, dicofol, chlorpropylate or tetradifon), lipid amides, bicyclooctanes and dithianes. Suitable herbicides include glyphosate.

The sprays may be delivered by pumping through a nozzle, especially a sonic nozzle, by pumping over an ultrasonic nebulizer, or via a spinning disc. The droplets may be electro-statically charged, if desired.

As well as the uses discussed above, at least some of the formulations of the invention can be used to form a larvicidal film over a lake.

To determine whether a given formulation satisfies the Formula given above, the following procedure may be adopted. If the formulation is an emulsion, the emulsion should first be "broken" by extraction of the concentrate with a suitable solvent such as ether. The ingredients are then analysed by suitable quantitative and qualitative analytical methods. If not already known, the miscibility of each component with water is tested: if the component is water-miscible in the conditions of the formulation, it is excluded from the calculations. The solubility of the evaporation retardant in the oil phase (excluding water-miscible components) is determined. The parameters are then operated on in the manner defined in the Formula to see whether the (mass of oil phase)/(mass of retardant) ratio is less than or equal to the figure on the right hand side of the Formula. This procedure is explained below with specific reference to the Examples.

Preferred embodiments of the invention will now be described by way of example.

The present invention also relates to a method of controlling the damage caused by phytophagus insects to crops by the application of an anti-evaporant formulation containing an insecticide using the above described spray formulations which have evaporation retardant properties such formulations contain an oil phase, a retardant and an active ingredient, for example a pesticide.

Mite resurgence is a phenomenon encountered when broad spectrum insecticides, such as the pyrethroids, are used to control insects on crops. Treatment with the pyrethroids controls the major pest on the crops, for example caterpillars, but results in an explosion of the mite population which was previously at a low density (mite resurgence). One reason for mite resurgence is that the pyrethroids stimulate the mites to increase their reproductive rate.

The above described spray formulations containing a pyrethroid can be applied to crops without causing mite resurgence.

Accordingly, the present invention also provides a method of controlling insects on plants which comprises the application to the plant of an effective amount of an aqueous formulation that contains a pyrethroid insecticide as active ingredient, an evaporation retardant and an emulsifier that satisfies the formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \cdot X \text{ Exp } [[\ln(L/4) + [C \times \ln(AX^B)]]/C]$$

where L is less than or equal to 15, A=700376, B=−1.51, C=0.8472,

$M_{oil}$ is the weighted average relative molar mass of the oil phase,

$M_{retardant}$ is the average molar mass of the retardant, and

$$X=M_{oil}^{1.8}/Y$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of oil phase which will dissolve the retardant, divided by the number of moles of retardant, provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded.

The "oil phase" is the liquid non aqueous phase and will comprise one or more of the active ingredient, the solvent therefore and in some cases the emulsifier.

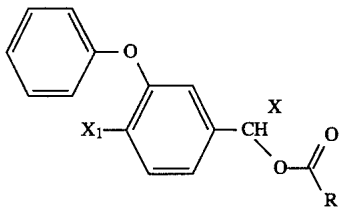
For the avoidance of doubt, and to clarify any ambiguities which may arise in the printing or copying of this specification, it is to be noted that the relational symbol "≦" in the Formula is "less than or equal to", "Exp" means the exponential of what follows in brackets, "ln" means the natural logarithm, i.e. $\log_e$, L is divided by 4, X is raised to the power B, B is a negative value (minus 1.51) and, in the definition of X, Moil is raised to the power 1.8.

Preferably L is less than 12, 10, or 8 and is most preferably less than 5. A distilled water spray has an "L" value of about 26, and most conventional diluted formulations have a value of about 22–30. In the formulations of the invention, "L" can be set at a desired value in order to calculate the required ratios of the ingredients.

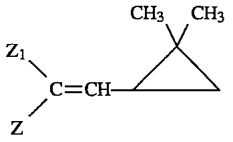
$M_{oil}$, the average molecular weight of the oil phase, is the weighted average, i.e. taking into account the relative proportions of the ingredients.

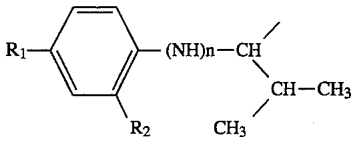
The value "Y" namely the molar solubility ratio of the formulation, may be derived empirically by making up at 40° C. a series of mixtures with different ratios of oil phase to alkanol, allowing the mixtures to cool to 27° C., leaving the cool mixtures for at least 48 hours at 27° C., and determining the amount, in moles, of the oil phase which is needed to dissolve completely a given amount of retardant, in moles. The former is then divided by the latter to give Y.

Examples of pyrethroid insecticides include those of the formula (I)

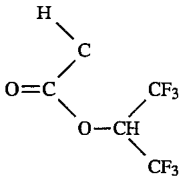


where R is

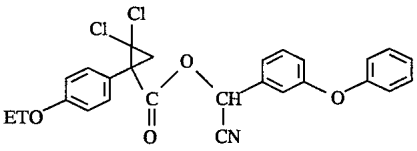


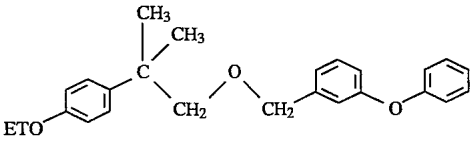


$R_1$ is halo, $CF_3$ or $CHF_2O$, $R_2$ is hydrogen or halo, n is 0 or 1, and Z and $Z_1$ are each independently selected from halo, $CF_3$ and methyl, or Z(Z1)C=represents:



X is hydrogen or halo, and X is H, CN or C≡CH, or pyrethroids of formula:





Examples of pyrethroids are:

3-phenoxybenzyl-(1RS)-cis,trans-3-(2,2-dichlorovinyl-2,2-dimethylcyclopropanecarboxylate (permethrin),

(RS)-α-cyano-3-phenoxybenzyl-(1RS)-cis,trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate (cypermethrin) and its individual isomers such as the (1RS) cis isomer (alphamethrin) and the four isomer mixture betamethrin,

(S)-α-cyano-3-phenoxybenzyl-(1R )-cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate (deltamethrin), or a reaction mixture comprising two enantiomeric pairs in approximately ratio 2:3,

(S)-α-cyano-3-phenoxybenzyl-(1R)-cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate,

(R)-α-cyano-3-phenoxybenzyl-(1S)-cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate with (S)-α-cyano-3-phenoxybenzyl-(1R)-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate

(R)-α-cyano-3-phenoxybenzyl- (1S)-trans-3-(2,2-dichlorovinyl)—2,2-dimethylcyclopropanecarboxylate (beta-cypermethrin),

(RS)-α-cyano-3-phenoxybenzyl-(Z)-(1RS) -cis-3-(2-chloro-3,3,3-trifluoropropenyl)-2,2-dimethylcyclopropanecarboxylate (cyhalothrin) and a mixture of its (S)(Z)-(1R)-cis and (R) (Z)-(1S)-cis-isomers,

(S)-α-cyano-3-phenoxybenzyl-(1R,3S)-3-[(Z)-3-[bis (trifluoromethyl)methoxy]-3-oxo-1-propenyl]-2,2-dimethylcyclopropanecarboxylate (acrinathrin),

(RS)-α-cyano-3-phenoxybenzyl-(RS)-2-(4-chlorophenyl)-3-methylbutyrate (fenvalerate) and the single (S), (S) isomer (esfenvalerate),

(RS)-α-cyano-3-phenoxybenzyl-(S)-2-(4-difluoromethoxyphenyl)-3-methyl butyrate (flucythinate),

(RS)-α-cyano-3-phenoxybenzyl-N-(2-chloro-α, α, α-trifluoro-p-tolyl)-D-valinate (fluvalinate),

(RS)-α-cyano-4-fluoro-3-phenoxybenzyl-(1RS)-cis-trans-3-(2,2-dichlorovinyl)-2,2-di-methylcyclopropanecarboxylate (cyfluthrin),

(RS)-α-cyano-4-fluoro-3-phenoxybenzyl-(1RS)-cis-trans-3-(2-chloro-2(4-chlorophenyl)vinyl)-2,2-dimethylcyclopropanecarboxylate (flumethrin), 2-methylbiphenyl-3-yl-methyl-(Z)-1RS,3RS)-3-(2-chloro-3,3,3-trifluoro-prop-1-enyl)-2,2-dimethylcyclopropanecarboxylate (Bifenthrin); the allethrins, for example (1RS)-3-allyl-2-methyl-4-oxocylopent-2-enyl-(1R,3R)-2,2-dimethyl-3-(2-methylprop-1-enyl)-cyclopropanecarboxylate (bioallethrin),

(1S) -allyl-2-methyl-4-oxocyclopent-2-enyl-(1R, 3R)-2,2-dimethyl-3-(2-methylprop-1-enyl)cyclopropanecarboxylate (S-bioallethrin), and mixtures of allethrin isomers (esbiothrin); the resmethrins, for example 5-benzyl-3-furylmethyl(IRS, 3RS; IRS, 3SR)-2,2-dimethyl-3-(2-methyl-prop-1-enyl)cyclopropanecarboxylate (resmethrin) and 5-benzyl-3-furylmethyl (1R,3R)-2,2-dimethyl-3-(2-methylprop-1-enyl)cyclopropanecarboxylate (bioresmethrin).

Octadecan-1-ol and, particularly, hexadecan-1-ol are preferred evaporation retardants. Hexadecan-1-ol (also known as cetyl alcohol) is usually available commercially as a mixture with a minor proportion of octadecan-1-ol (stearyl alcohol) and such "cetostearyl alcohol" is quite satisfactory. Heptadecan-1-ol performs adequately but is much more expensive. Other highly effective evaporation retardants include 1-hexadecylamine, 1-heptadecylamine and 1-octadecylamine. Less preferred evaporation retardants include hexadecan-2-ol, 1,2-hexadecandiol, methyl stearate, stearyl acetate, methyl palmirate and 1,2-octadecandiol. N-alkoxyalkanols may be used, for example $CH_3(CH_2)_{21}OC_2H_4OH$, $CH_3(CH_2)_{21}OC_3H_6OH$, $CH_3(CH_2)_{17}OC_2H_4OH$ or $CH_3(CH_2)_{15}OC_2H_4OH$, as may oxyethylene-docosanol and mixtures of any of the said evaporation retardants.

The amount of emulsifier present in the formulation will be less than twice the amount of the evaporation retardent present and will preferably be less than the amount of the evaporation retardant present.

The emulsifier may be any suitable compound or mixture of compounds. Cationic emulsifiers can be used, but they tend to irritate the user's eyes. Artionic emulsifiers such as calcium dodecyl benzenesulphate (CDBS) or sodium d-isopropyl naphthalenesulphonate (SDNS) can also be used, but these are not as effective at stabilising the emulsion whilst maintaining evaporation retarding properties. Preferably, the emulsifier is a non-ionic compound, or mixture of non-ionic compounds, having an HLB (hydrophilic/lipophilic balance) of 6–20 and preferably 8–18. Suitable compounds include polyoxyethylene stearyl ethers (PSE), polyoxyethylene monolaurates (PEM), polyoxyethylene mono-oleates (PMO), sorbitan mono-oleate (SMO), nonylphenol ethoxylate (NPE), polyethylene glycol (PEG) and blends of oleyl ethoxylate (10 mole), and PEG20 glyceryl oleate (OE/PGO).

These emulsifiers are available as follows:

| Abbrev | Trade name | Supplier |
|---|---|---|
| OE/PGO | Tegoplant EM11 | Th. Goldschmidt Ltd. |
| PSE | Brij 72, Brij 76, Brij 78 | ICI Speciality Chemicals |
| PEM | Tween 20 | ICI Speciality Chemicals |
| SMO | Span 80 | ICI Speciality Chemicals |
| PMO | Tween 80 | ICI Speciality Chemicals |
| NPE | Ethylan KEO, 55, BV | Lankro Chemicals Limited |
| CDBS | Arylan CA | Lankro Chemicals Limited |
| SDN | Aerosol OS | Cyanamid GB Ltd. |

The solvent, at least for an oil-soluble active ingredient, preferably has a low relative molecular mass, namely less than about 200.

Suitable compounds include aromatic hydrocarbons, lower alkyl esters, lower ketones, lower alkanols and lower alkanes, the term "lower" meaning C1–12, preferably C1–10 and more preferably C1–8.

Particular solvents include the following, all available from Exxon Chemicals Limited;

"Solvesso 150"—An aromatic hydrocarbon solvent (C9 to C11) with a distillation range 190° to 210° C.

"Solvesso 200"—An aromatic hydrocarbon solvent (C10 to C12) with a distillation range 226° to 290° C.

"Exxate 700"—Heptyl acetate 99% pure, or Odourless kerosene—A mixture of high boiling non-aromatic hydrocarbons consisting of paraffins and naphthenes with a distillation range of 180° to 270° C.

The formulation may comprise more than one pyrethroid (optionally with a synergist or potentiator, which is regarded as an active ingredient for the purpose of the Formula above), more than one solvent, more than one emulsifier and/or more than one stabiliser, together with other ingredients such as perfumes and dyes.

The present invention also provides a method for preventing the resurgance of mite infestation in plants when treated with pyrethroid insecticides which comprises the application to the plant of an aqueous formulation that contains the pyrethroid insecticide as active ingredient, an evaporation retardant and an emulsifier that satisfies the Formula described hereinbefore.

## EXAMPLE 1A

A ULV insecticide formulation is made up as follows:

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 10.32 | 391 |
| S-Bioallethrin | 1.51 | 302 |
| Piperonyl Butoxide | 11.32 | 338 |
| Odourless kerosene | 9.30 | 170 |
| Hexadecan-1-ol | 3.00 | 242 |
| Emulsifiers | | |
| Tegoplant EM11 | 0.75 | |
| Brij 76 | 0.24 | |
| Tween 20 | 0.01 | |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Aqueous phase | | |
| Water | 63.45 | 18 |
| Silocolapse 5000 | 0.10 | — |

"Silcolapse" is a Regd. T.M.

The concentrade is diluted 1+9 parts with water for application.

Average relative molar mass of oil phase=271

Molar solubility ratio (moles oil phase/moles alkanol)= 9.4

Model prediction: ratio (mass of oil phase/mass of alkanol) of a formulation within the scope of the invention:

Maximum ratio with an evaporation rate (L) of 15=27.5. with L of 10=17 and with L of 5=7.

Hence, the invention encompasses all such formulations where the mass ratio for this solvent/pesticide mixture to hexadecan-1-ol is less than or equal to 27.

The above formulation has the ratio (mass of oil phase/ mass of alkanol)=10.8 and the ratio (moles water/moles of alkanol)=4318 when diluted.

Observed averake evaporation rate (L) =3.8

## EXAMPLE 1B

### A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 10.87 | 391 |
| S-Bioallethrin | 0.15 | 302 |
| Piperonyl butoxide | 11.07 | 338 |
| Odourless kerosene | 9.30 | 170 |
| Hexadecan-1-ol | 3.00 | 242 |
| Emulsifiers | | |
| Tegoplant EM11 | 0.75 | |
| Brij 76 | 0.24 | |
| Tween 20 | 0.01 | |
| Aqueous phase | | |
| Water | 64.51 | 18 |
| Silcolapse 5000 | 0.10 | |

## EXAMPLE 2

### A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil Phase | | |
| Deltamethrin | 1.0 | 505 |
| Heptyl acetate (Exxate 700) [Exxon Chemicals] | 30.0 | 158 |
| Hexadecan-1-ol | 5.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Silicolapse 5000 (anti foam agent) | 0.1 | — |
| Water | 62.9 | 18 |

The concentrate is diluted 1+19 parts with water for spray application.

The parameters for these and the subsequent Examples are given in Table 1.

## EXAMPLE 3

### A ULV insecticide Formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil Phase | | |
| Alpha cypermethrin | 2.0 | 416 |
| Heptyl acetate (Exxate 700) [Exxon Chemicals] | 30.0 | 158 |
| Hexadecan-1-ol | 7.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |
| Water | 60.0 | 18 |

Observed average evaporation rate =4.5

## EXAMPLE 4

### A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 25.0 | 391 |
| 4-methylpentan-2-one | 32.0 | 100 |
| Hexadecan-1-ol | 6.0 | 242 |
| Propan-2-ol | 32.0 | —* |
| Emulsifiers | | |
| Tween 80 | 3.6 | |
| Span 80 | 1.4 | |

*assumed to partition mostly into the aqueous phase on dilution as it is water-miscible.

This formulation was found to be particularly effective.

## EXAMPLE 4B

### A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 25.0 | 391 |
| Hexadecan-1-ol | 6.0 | 242 |
| Emulsifiers | | |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| PMO | 3.6 | |
| SMO | 1.4 | |
| Aqueous phase | None | |

## EXAMPLE 5

A pressure packed insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Bioallethrin | 0.315 | 302 |
| Permethrin | 0.038 | 391 |
| Odourless kerosene | 8.3 | 170 |
| Butane | 40.0 | —* |
| Hexadecan-1-ol | 1.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |
| Water | 50.347 | 18 |

*excluded due to its volatility (vapour at normal temperatures and pressures)

## EXAMPLE 6

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Pyrethrins (PY) | 2.0 | 350 |
| Solvent in PY extract | 6.0 | 150 |
| Piperonyl Butoxide | 16.0 | 338 |
| Octadecan-1-ol | 2.5 | 270 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |
| Water | 72.4 | 18 |
| Silcolapse 5000 | 0.1 | — |

Ready use concentrate (no further dilution required).

## EXAMPLE 7

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Chlorpyrifos-methyl | 20.0 | 323.0 |
| Solvesso 150 [Exxon Chemicals] | 20.0 | 144.0 |
| Hexadecan-1-ol | 3.0 | 242 |
| Emulsifiers | | |
| Tegoplant EM11 | 2.0 | — |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Aqueous phase | | |
| Water | 54.9 | 18 |
| Silcolapse 5000 | 0.1 | |

## EXAMPLE 8

A wettable powder formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Inorganic carrier | | |
| Celite 204 | 64.0 | — |
| Oil phase | | |
| Permethrin | 25.0 | 391 |
| Hexadecan-1-ol | 6.0 | 141 |
| Emulsifiers/dispersing agents | | |
| Tegoplant EM11 | 1.0 | |
| Sodium diisopropyl naphthalene sulphonate e.g. Aerosol OS [Cyanamid G.B. Ltd.] | 4.0 | |

## EXAMPLE 9

A ULV herbicide formulation (containing water soluble herbicide).

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 200 | 10.0 | 163.0 |
| Hexadecan-1-ol | 3.0 | 242 |
| Emulsifiers | | |
| Span 80 | 6.6 | |
| Tween 80 | 3.4 | |
| Aqueous phase | | |
| Water | 40.0 | 18 |
| Glyphosate -mono isopropylammonium | 36.9 | |

This formulation may be modified for other water-miscible active ingredients, for example the components of Bordeaux mixture or quaternary ammonium compounds.

## EXAMPLE 10

An LV synergist spray.

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Piperonyl butoxide | 64.0 | 338 |
| Hexadecan-1ol | 7.5 | 242 |
| Emulsifiers | | |
| NPE | | 7.0 |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Propan-2-ol | 21.5 | |

## EXAMPLE 11

An LV insecticide spray.

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 150 | 8.8 | 144 |
| Hexadecan-1-ol | 1.2 | 242 |
| Emulsifiers | | |
| SMO | | 0.3 |
| PMO | | 0.9 |
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Dimethoate | 80.0 | |
| Propan-2-ol | 8.8 | |

## EXAMPLE 12

A wettable powder insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 150 | 25.0 | 144 |
| Hexadecan-1-ol | 5.0 | 242 |
| Emulsifiers | | |
| SDNS | | 7.5 |
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Diflubenzuron | 25.0 | |
| Mineral silicates | 37.5 | |

## EXAMPLE 13

A flowable fungicide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 150 | 15.0 | 144 |
| Hexadecan-1-ol | 6.0 | 242 |
| Emulsifiers | | |
| SMO | | 1.4 |
| PMO | | 3.6 |
| Aqueous phase | | |
| Water (pH = 13) | 48.9 | 18 |
| Sodium hydroxide | 0.1 | |
| 1,2 propandiol | 4.0 | |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Inert/water soluble ingredients | | |
| Thiabendazole | 20.0 | |
| Xanthan gum | 0.5 | |
| Mineral silicates | 0.5 | |

## EXAMPLE 14

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Exxate 700 | 5.0 | 158 |
| Hexadecan-1-ol | 4.0 | 242 |
| Emulsifiers | | |
| OE/PGO | 2.4 | |
| Aqueous phase | None | |

## EXAMPLE 15

A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Cypermethrin | 10.0 | 416 |
| Solvesso 150 | 40.0 | 144 |
| Hexadecan-1-ol | 4.0 | 242 |
| Emulsifiers | | |
| OE/PGO | 2.0 | |
| Aqueous phase | | |
| Water | 44.0 | |
| Inert/water soluble ingredients | | |
| | None | |

## EXAMPLE 16

A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Methoprene | 28.0 | 311 |
| Solvesso 150 | 28.0 | 144 |
| Hexadecan-1-ol | 7.0 | 242 |
| Emulsifiers | | |
| NPE | | 4.0 |
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Propsal-2-ol | 33.0 | |

EXAMPLE 17

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Amitraz | 18.0 | 293 |
| Solvesso 150 | 36.0 | 144 |
| 1-Hexadecylamine | 16.3 | 242 |
| Emulsifiers | | |
| SMO | | 1.8 |
| PMO | | 4.5 |
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Propan-2-ol | 23.4 | |

EXAMPLE 18

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Malathion | 65.0 | 330 |
| Hexadecan-1-ol | 7.5 | 242 |
| Emulsifiers | | |
| SMO | | 2.0 |
| PMO | | 5.0 |
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Propan-2-ol | 20.5 | |

EXAMPLE 19

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Fenitrothion | 65.0 | 277 |
| Hexadecan-1-ol | 4.0 | 242 |
| Emulsifiers | | |
| SMO | | 2.0 |
| PMO | | 5.0 |
| Aqueous phase | None | |
| Inert/water soluble ingredients | | |
| Propan-2-ol | 24.0 | |

Comparative Example A

(A ULV insecticide formation)*

| Oil phase | % mass/mass | Rel. molar mass |
|---|---|---|
| Permethrin | 10.8 | 391 |
| S-Bioallethrin | 1.7 | 302 |
| Piperonyl Butoxide | 12.3 | 338 |
| Mineral oil | 20.0 | 296 |
| Kerosene | 41.7 | 170 |
| Hexadecan-1-ol | 1.0 | 242 |
| Nonylphenol ethylene oxide condensate** | 8.2 | 638 |
| Calcium dodecyl benzenesulphonate** | 4.3 | 394 |

**emulsifiers assumed to partition mostly into aqueous phase on dilution.

Dilute 1+9 with water for application.

Average relative molar mass of oil phase=254

Molar solubility ratio (moles oil phase/moles long chain alcohol)=10.0

Model prediction ratio {mass of oil phase/mass of alkanol) of a formulation within the scope of the invention:

Maximum ratio with an evaporation rate (L) of 15 units=33.0, with an L of 10 units=20.4, and with an L of 5 units=9.0

The above formulation has the ratio (moles of oil phase/moles long chain alcohol)=86, and is therefore outside the scope of the invention.

The ratio (moles of water/moles of alkanol)=12100 on dilution.

Observed average evaporation rate=20 units

*Example 1 of GB-A-2 095 109.

ANALYSIS OF FORMULATIONS

The analysis of a given formulation to determine whther it satisfies the formula above is illustrated as follows.

Analysis of Example 1A

The permethrin, S-bioallethrin, piperonyl butoxide, odourless kerosene, emulsifiers and antifoam agent could constitute the oil phase. Each one of these components may be taken in turn at the level in the formulation and diluted in water (%1+9). Onr would observe that the permethrin, S-bioallethrin, odourless kerosene and piperonyl butoxide are not miscible with water at this dilution level, eg. permethrin has a solubility of 0.2 mg/l of water at 30° C. These components would therefore constitute the oil phase. The emulsifiers would be miscible with water giving a clear solution upon dilution. Of the antifoam agent, (o.1%) 30% of this would not be soluble in the oil phase or the water and would simply be classed as an inert ingredient. The oil phase would then be constituted in the proportions in the formulation. The solubility limit of hexadecan-1-ol would be determined by preparing s series of mixtures and noting the maximum composition at which all the hexadecan-1-ol remained in solution at 27° C. after a period of 24 hours. A mixture containing 8.7% mass/mass of hexadecan-1-ol is the composition in this case. The relative molar mass of the oil phase is also required. This is calculated as follows from the relative molar mass of each component and the proportions in the oil phase:

$$\frac{10\,32}{391} + \frac{1.51}{302} + \frac{11.32}{338} + \frac{9.30}{170} = \frac{32.45}{RMM\ \text{mixture}}$$

RMM mixture=271

The relative molar mass of hexadecan-1-ol is 242.

The molar solubility ratio (moles oil phase/moles film forming agent)

=((100–8.7)/271)/(8.7/242)=9.37

This provides all the variables to use in the right hand side of the equation. With L=15 the predicted maximum ratio of mass of oil phase to film forming agent is 27. The above formulation has a mass of oil phase to film forming agent of 10.8 (33.45/3). Therefore it is clearly within the scope of the formula. The level of hexadecan-1-ol could be reduced to 1.21% with the same level of oil phase and still remain within the cope of the formula. However, a formulation with 1.0% hexadecan-1-ol would be outside the scope of the formula.

Analysis of Example 4A

This formulation contains permethrin, 4-methylpentan-2-one, hexadecan-1-ol, emulsifiers and propan-2-ol. The formulation is diluted 1+9 parts with water for use.

All the components given could potentially constitute the oil phase once diluted. Propan-2-ol is completely miscible with water over all compositions. The emulsifiers are also water miscible when diluted. The permethrin and 4-methyl pentan-2-one are not completely miscible with water when diluted at this level. The oil phase therefore consists of permethrin and 4-methyl-pentan-2-one. The solubility of hexadecan-1-ol is determined in this mixture as described above at 27° C. The solubility of hexadecan-1-ol in the mixture of permethrin and 4-methylpentan-2-one is 16.0% mass/mass. The relative molar mass of the oil phase is calculated from the relative molar mass of the components and their proportion in the oil phase:

$$\frac{25.0}{391}+\frac{32.0}{100}=\frac{87.0}{RMM\ \text{mixture}}$$

RMM mixture=149

The relative molar mass of hexadecan-1-ol is 242.

The molar solubility ratio (moles oil phase/moles film forming agent)

=([100–16.1])/149)/(16/242)=8.5

This gives all the variables to be used on the right hand side of the equation. With L=15 then the maximum ratio of oil phase to hexadecan-1-ol is 66. The above formulation has a mass ratio of oil phase to film-forming anent of 9.5 and is therefore well within the scope of the formula. The level of hexadecan-1-ol could be reduced to 0.87% whilst maintaining the oil phase levels constant and still remain within the scope of the formula.

Analysis of Example 4B

It will be observed that this formulation is the same as that given as example 4A except that the formulation is ddiluted 1+29 parts with water. Permethrin is the only component within the formulation that is immiscible with water at this level of dilution. 0.32 g of 4-methyl-pentan- 2-one dissolves completely in 29 g of water. The permethrin in this example constitutes the oil phase. The solubility of hexadecan-1-ol in permethrin is 1.8% w/w which gives a molar solubility ratio of 33.7.

With L=15 the maximum ratio of oil phase to film-forming agent is 99. At this dilution level the level of hexadecan-1-ol in the formulation could be reduced to 0.4% and still remain within the scope of the formula. This also provided an example of where the evaporation rate of a formulation is improved as a result of further dilution because of additional partitioning of one of the oil phase components in the aqueous phase. There is less oil phase for the film forming agent to dissolve in, thus more will be available to form a film at the surface of the droplet.

Analysis of Example 13

This formulation contains Solvesso 150, hexadecan-1-ol, emulsifiers, water, sodium hydroxide, 1,2-propandiol, thiabendazole, xanthan gum, and mineral silicates. This is a fairly complex formulation. The active ingredient is not particularly soluble in the aqueous or oil phase. A fine particulate suspension of the active ingredient is therefore made. The formulation also contains a thickening agent to aid the suspension of the particulates. This is a high molecular weight polysaccharide that is insoluble in the oil phase and can be regarded as an inert substance. The formulation also contains powered mineral silicates of low bulk density to prevent the formulation "caking" (particles sticking together). The 1,2-propandiol is added to prevent freezing and is completely water miscible. The sodium hydroxide is added to buffer the formulation at around pH13 and is water soluble. The oil phase therefore consists of only Solvesso 150 with possibly a small amount of thiabendazole dissolved in it.

The solubility of hexadecan-1-ol in Solvesso 150 is 23.5% mass/mass. The relative molar mass of Solvesso 150 is 144. The molar solubility is 5.5.

The right hand side of the formula with L=15, gives a ratio mass of oil phase/mass of film forming agent)+35. The formulation has a mass ratio of 2.5 and is The solubility of hexadecan-1-ol in Solvesso 150 is 23.5% mass/mass. The relative molar mass of Solvesso 150 is 144. The molar solubility is 5.5.

The right hand side of the formula with L=15, gives a ratio (mass of oil phase/mass of film forming agent)= 35. The formulation has a mass ratio of 2.5 and is clearly within the scope of the formula. The level of hexadecan-1-ol could be reduced substantially and the formulation would remain within the scope of the formula.

TABLE 1

| Example No: | 1A | 1B | 2 | 3 | 4A | 4B |
|---|---|---|---|---|---|---|
| Dilution for appln. 1 + n | 9 | 9 | 19 | 29 | 9 | 29 |
| Av. Rel. Molar mass of oil phase | 271 | 271 | 162 | 164 | 149 | 391 |
| Mass solubility | 8.7 | 8.7 | 16.5 | 16.5 | 16.0 | 1.8 |
| Molar solubility ratio | 9.4 | 9.4 | 7.6 | 7.5 | 8.5 | 33.7 |
| Maximum ratio calcd. for L | | | | | | |
| L = 15 | 27 | 27 | 47 | 45 | 66 | 99 |
| L = 10 | 17 | 17 | 29 | 28 | 41 | 61 |
| L = 5 | 7 | 7 | 13 | 12 | 18 | 27 |
| Mass of oil | | | | | | |
| Mass of film-former | 10.8 | 10.5 | 6.2 | 4.6 | 9.5 | 9.5 |
| L measured | 3.8 | 3.8 | 4.0 | 4.5 | 5.0 | 4.2 |
| Moles (water) | | | | | | |

TABLE 1-continued

| Moles (film-former) | 4318 | 5278 | 5278 | 5683 | 2016 | 6498 |
|---|---|---|---|---|---|---|
| Example No: | 5 | 6 | 7 | 8 | 9 | |
| Dilution for appln. 1 + n | 0 | 0 | 14 | 39 | 39 | |
| Av. Rel. Molar mass of oil phase | 173 | 258 | 199 | 391 | 153 | |
| Mass solubility | 7.5 | 4.0 | 9.0 | 1.8 | 12.5 | |
| Molar solubility ratio | 17.2 | 25.1 | 12.2 | 33.7 | 10.4 | |
| Maximum ratio calcd. for L | | | | | | |
| L = 15 | 145 | 116 | 68 | 99 | 75 | |
| L = 10 | 90 | 72 | 42 | 61 | 47 | |
| L = 5 | 40 | 32 | 19 | 99 | 21 | |
| Mass of oil | | | | | | |
| Mass of film-former | 8.6 | 9.6 | 13.3 | 8.5 | 8.5 | |
| L measured | 3.8 | 4.8 | 4.7 | 5.3 | 3.8 | |
| Moles (water) | | | | | | |
| Moles (film-former) | 663 | 435 | 6520 | 6691 | 32490 | |
| Example No: | 10 | 11 | 12 | 13 | 14 | |
| Dilution for appln. 1 + n | 39 | 29 | 39 | 49 | 19 | |
| Av. Rel. Molar mass of oil phase | 338 | 144 | 144 | 144 | 158 | |
| Mass solubility | 5.5 | 23.5 | 23.5 | 23.5 | 16.5 | |
| Molar solubility ratio | 12.3 | 5.5 | 5.5 | 5.5 | 7.8 | |
| Maximum ratio calcd. for L | | | | | | |
| L = 15 | 28 | 35 | 35 | 35 | 51 | |
| L = 10 | 17 | 22 | 22 | 22 | 32 | |
| L = 5 | 8 | 10 | 10 | 10 | 14 | |
| Mass of oil | | | | | | |
| Mass of film-former | 5.0 | 2.5 | 5.0 | 2.5 | 1.3 | |
| L measured | 5.3 | 7.5 | 7.0 | 7.5 | 7.3 | |
| Moles (water) | | | | | | |
| Moles (film-former) | 6991 | 11089 | 10487 | 11089 | 9747 | |
| Example No: | 15 | 16 | 17 | 18 | 19 | |
| Dilution for appln. 1 + n | 19 | 19 | 19 | 19 | 19 | |
| Av. Rel. Molar mass of oil phase | 166 | 197 | 173 | 330 | 277 | |
| Mass solubility | 15.0 | 18.5 | 20.1 | 1.9 | 0.8 | |
| Molar solubility ratio | 8.2 | 5.4 | 5.5 | 37.8 | 108 | |
| Maximum ratio calcd. for L | | | | | | |
| L = 15 | 52 | 20 | 26 | 157 | 1038 | |
| L = 10 | 32 | 13 | 16 | 97 | 643 | |
| L = 5 | 14 | 6 | 7 | 43 | 284 | |
| Mass of oil | | | | | | |
| Mass of film-former | 12.5 | 8.0 | 3.3 | 8.7 | 16.3 | |
| L measured | 4.7 | 7.8 | 4.5 | 6.4 | 5.1 | |
| Moles (water) | | | | | | |
| Moles (film-former) | 6534 | 3649 | 1567 | 3402 | 6386 | |

The following examples illustrate representative formulations to be applied and the biological properties of such formulations:

## EXAMPLE 20

Formulation 1

| Ingredient | % w/w |
|---|---|
| Permethrin (Technical) | 10.32 |
| Piperonyl Butoxide (Technical) | 12.83 |
| Cetyl Alcohol | 3.00 |
| Odourless Kerosene | 9.70 |
| Emulsifier Blend | 1.00 |
| Deionised Water | 62.75 |
| Silcolapse 5000 | 0.10 |
| Formaldehyde Solution | 0.30 |
| | 100.00 |

1% Emulsifier Blend consists of 0.75% Emulgator BT02, 0.1% BRIJ 78, 0.1% BRIJ 72 and 0.05% TWEEN20.

Emulgator BT02 is equivalent.to Tegoplant EM11 described in European Patent 331474.

### Biological Properties

1501 m Diameter droplets of Ambush™ (which is a formulation marketed by ICI Americas Inc) and formulation 1 were applied to 2 cm diameter leaf discs cut from "Henderson" lima beans. Both formulations were mixed in water at a rate of 12.5 g a.i. per liter.

Droplets were applied at densities of 25, 50, 75, 100, 150 and 200 per leaf disc. Five replicate leaf discs were used per droplet density. Five replicate control leaf discs were left untreated.

Leaf discs were left to dry for one hour. Five adult female two-spotted spider mites (TSSM) were then placed on each leaft disc using a fine camel-hair brush. The mites were obtained from cultures reared on greenhouse lima beans at the OARDC. The leaf discs were placed on moistened cotton in 3 cm diameter petri dishes and were maintained in the laboratory at room temperature (22°–25° C.).

At 24 and 48 hours following treatment, the following were assessed: mortality, the number of mites on and off the leaf disc, the number of eggs and the number of feeding scars. Mites were recorded as dead when they would not respond to gentle prodding.

For each parameter measured the data were analysed using a one-way analysis of variance. Significant treatment effects were partitioned using a Student-Newman-Keuls (SNK) multiple range test. Prior to analyses, the data were first transformed using either percentages and arcsin-square-root (mortality, irritancy) or log10 n+1 (eggs/mite, scars/mite). The effects of droplet density upon the parameters measured were then subsequently analysed using linear regression analyses.

The individual treatment means and the results of the SNK multiple range test were plotted for irritancy, fecundity and feeding rate at 24 hours after exposure. Significant treatment effects were detected in the measurements of irritancy, fecundity and feeding rate but not in the measurement of mortality. In all, very few mites died throughout the study, in any of the treatments. This was expected as the rates of permethrin that were chosen were selected in order to investigate the sub-lethal effects of these pesticides upon TSSM.

For all the parameters measured, no treatment effects were detected for formulation 1. However, significant treatment effects were detected with Ambush.

By increasing the droplet density, it was observed with Ambush, a significant increase in the number of TSSM leaving the leaf, which took place concomitant with a significant decrease in the number of eggs laid and the amount of feeding activity (despite a correction for the number of TSSM that remained on the leaf).

What is claimed is:

**1**. A formulation suitable for spraying or for dilution with water to form a sprayable preparation, the formulation consisting essentially of an active ingredient, an emulsifier and an evaporation retardant, wherein the formulation satisfies the following formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \text{Exp}\,\frac{\ln(L/4) + C\ln(AX^B)}{C}$$

where L is less than or equal to 15, A=700376, B=−1.51, C=0.8472, the oil phase is the liquid non-aqueous phase containing the active ingredient, solvent if present and the emulsifier, provided those components are not miscible with water at the dilution level employed,

$M_{oil}$ is the weighted average relative molar mass of the oil phase,

$M_{retardant}$ is the weighted average relative molar mass of the retardant, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of the oil phase which will dissolve the retardant, divided by the number of moles of retardant,

provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded, and wherein the active ingredient is sprayable in a water-based formulation and is an insecticide, acaricide, herbicide, fungicide, plant growth regulator, insect behavior modifier, biological control agent, dye, perfume, bactericide, lubricant, medicament, paint, polish, lacquer or textile treatment, the emulsifier is an anionic compound, a cationic compound, a nonionic compound or mixtures thereof having a hydrophilic/lipophilic balance of 8 to 18, and the evaporation retardant is a $C_{16-20}$ alkanol, 1-hexadecylamine, 1-heptadecylamine or 1-octadecylamine and

wherein the formulation optionally also contains a carrier or solvent for the active ingredient.

**2**. A formulation according to claim **1** wherein L is less than 10.

**3**. A formulation according to claim **2** wherein L is less than 5.

**4**. A formulation according to claim **1** wherein the active ingredient is a pesticide or herbicide.

**5**. A formulation according to claim **4** wherein the active ingredient is a pyrethroid.

**6**. A formulation according to claim **1** wherein the solvent has a relative molar mass of less than 200.

**7**. A formulation according to claim **6** wherein the solvent comprises kerosene, odorless kerosene, mineral oil, heptyl acetate, 4-methylpentan-2-one or butane.

**8**. A formulation according to claim **1** wherein the formulation is an ultra-low volume concentrate and the proportion of the oil phase is between 8% and 30% by mass before dilution for use.

**9**. A formulation according to claim **1** wherein the formulation is a wettable power.

**10**. A formulation according to claim **1** wherein the evaporation retardant is hexadecan-1-ol or a mixture of hexadecan-1-ol and octadecan-1-ol.

**11**. A formulation according to claim **10** which is to be diluted before use and which comprises more than 1.0 to 7.5% evaporation retardant by mass.

**12**. A formulation according to claim **1** wherein the emulsifier is a non-ionic compound with an HLB value of 8–18, or a mixture of non-ionic compounds, the mixture having a weighted average HLB value of 8–18.

**13**. A formulation according to claim **1** which is diluted and ready for use and which comprises 0.0 to 3.2% oil phase by weight.

**14**. A formulation according to claim **13** which is diluted and ready for use and which comprises 0.25 to 1.5% oil phase by weight.

**15**. A method of combating insect or acarine pests or unwanted plants by spraying a formulation according to claim **1**, optionally diluted with water, wherein the formulation comprises an insecticide, acaricide or herbicide.

**16**. A method of controlling insects on plants which comprises applying to the plant an effective amount of an aqueous formulation that consists essentially of a pyrethroid insecticide as an active ingredient, an evaporation retardant and an emulsifier, which formulation satisfies the formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \text{Exp}\,\frac{\ln(L/4) + C\ln(AX^B)}{C}$$

where L is less than or equal to 15, A=700376, B=1.51, C=0.8472, $M_{oil}$ is the weighted average relative molar mass of the oil phase $M_{retardant}$ is the average molar mass of the retardant, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of oil phase which will dissolve the retardant, divided by the number of moles of retardant, provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded, and wherein the active ingredient is sprayable in a water-based formulation and is an insecticide, acaricide, herbicide, fungicide, plant growth regulator, insect behavior modifier, biological control agent, dye, perfume, bactericide, lubricant, medicament, paint, polish, lacquer or textile treatment, the emulsifier is an anionic compound, a cationic compound, a nonionic compound or mixtures thereof having a hydrophilic/lipophilic balance of

8 to 18, and the evaporation retardant is a $C_{16-20}$ alkanol, 1-hexadecylamine, 1-heptadecylamine or 1-octadecylamine and

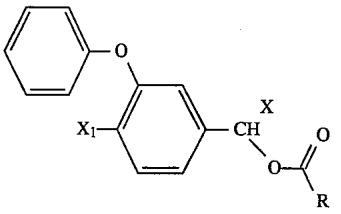
wherein the formulation optionally also contains a carrier or solvent for the active ingredient.

**17**. A method for preventing the resurgence of mite infestation in a plant when treated with pyrethroid insecticides which comprises the application to the plant of an effective amount of a formulation as defined in claim **16**.

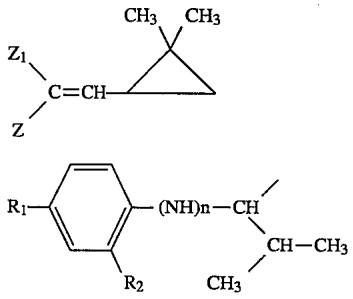
**18**. A method as claimed in claim **16** in which the formulation optionally comprises more than one pyrethroid optionally with a synergist or potentiator, which is regarded as an active ingredient for the purpose of the formula in claim **16**, and/or more than one solvent, and/or more than one emulsifier and/or more than one retardant, optionally together with other ingredients selected from perfumes and dyes.

**19**. A method as claimed in claim **16** in which the pyrethroid insecticides are either

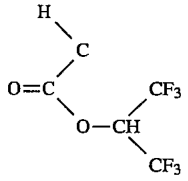
(a) a compound of formula (I)



wherein R represents

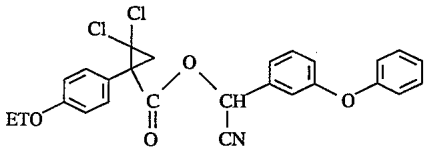


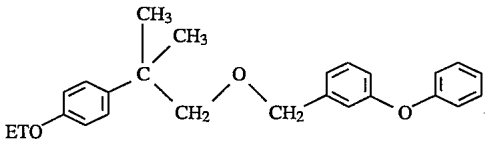
in which $R_1$ is halo, $CF_3$ or $CHF_2O$, $R_2$ represents hydrogen or halo, n is 0 or 1, and Z and $Z_1$ are each independently selected from halo, $CF_3$ and methyl; or $Z(Z_1)C$=represents:



X represents hydrogen or halo, and X is H, CN or C≡CH, in the form or individual isomers or mixtures thereof; or

(b) a compound of formula:





in the form of individual isomers ir mixtures thereof; or

(c) a compound selected from flumethrin, bifenthrin, bioallethrin, S-bioallethrin, esbiothrin, resmethrin, bioremesthrin and acrinathrin.

**20**. A method as claimed in claim **16** wherein L is less than 10.

**21**. A method as claimed in claim **5** wherein L is less than 5.

**22**. A method as claimed in claim **16** wherein the amount of emulsifier present in the formulation is less than twice the amount of the evaporation retardant present.

**23**. A method as claimed in claim **22** wherein the amount of emulsifier present in the formulation is less than the amount of the evaporation retardant present.

**24**. A method as claimed in claim **16** wherein the emulsifier is a non-ionic compound with an HLB (hydrophilic/lipophilic balance) value of 8–18, or a mixture of non-ionic compounds, the mixture having a weighted average HLB value of 8–18.

**25**. A method as claimed in claim **16** wherein the evaporation retardant is hexadecan-1-ol, octadecan-1-ol, octadecan-1-ol or a mixture thereof.

* * * * *

US005527823A

# United States Patent [19]

**Martin et al.**

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[45] **Date of Patent: *Jun. 18, 1996**

[54] **PESTICIDAL FORMULATIONS**

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[ * ] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 5,466,458.

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**Related U.S. Application Data**

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[51] **Int. Cl.**[6] ..... **A01N 37/34**; A01N 57/08; A01N 53/08; A01N 25/22

[52] **U.S. Cl.** ..... **514/521**; 514/89; 514/531; 514/122; 514/637; 514/549; 514/367; 514/594; 514/119; 504/706; 71/DIG. 1; 424/405

[58] **Field of Search** ..... 514/89, 521, 531, 514/122, 637, 549, 367, 594, 119; 504/206; 71/DIG. 1; 424/405

[56] **References Cited**

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[57] **ABSTRACT**

A formulation suitable for spraying or for dilution with water to form a sprayable preparation, the formulation comprising an active ingredient, optionally a carrier or solvent for the active ingredient, an emulsifier and an evaporation retardant, characterized in that the formulation satisfies formula

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \text{Exp}\left[\frac{\ln\left(\frac{L}{4}\right) + C\ln(AX^B)}{C}\right] \quad (I)$$

where L is less than or equal to 15, A=700376, B=−1.51, C=0.8472, $M_{oil}$ is the weighted average relative molar mass of the oil phase $M_{retardant}$ is the weighted average relative molar mass of the retardant, and X=($M_{oil}$) 1.8/Y, where Y is the molar solubility ration of the formulation, defined as the minimum number of moles of the oil phase which will dissolve the retardant, divided by the number of moles of retardant, provided that, in the formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded. The formulation may comprise a pesticide or herbicide. The action of the evaporation retardant is improved.

**18 Claims, No Drawings**

# PESTICIDAL FORMULATIONS

## PRIOR APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 924,044, filed Aug. 24, 1992, now abandoned and of U.S. patent application Ser. No. 979,452, filed Nov. 22, 1992, which is a continuation of U.S. patent application Ser. No. 845,804, filed Mar. 9, 1992, which is a continuation of U.S. patent application Ser. No. 438,399 filed Dec. 27, 1989 all abandoned.

## SPRAY FORMULATIONS

The present invention relates to spray formulations, especially pesticidal formulations of the sort which may be diluted with water to form a sprayable preparation, for example a pressure pack ("aerosol") preparation or a spray, particularly an ultra low volume (ULV) spray for domestic, horticultural, agricultural, environmental or industrial use.

Water-based sprays are advantageous because they cost less than oil-based sprays and are often less toxic to mammals. However, particularly when the ambient temperature is high, the water in the spray droplets evaporates and the droplets become smaller and drift more readily from the area being sprayed. The size of the droplets is frequently specially chosen to suit the application, for example to maximize droplet adherence to flying insects or adherence to plant Foliage, to increase bio-availability, or to control the size of the area being sprayed and the delivery rate per square meter; such care is pointless if the spray droplets change size, possibly unpredictably, following spraying.

GB-A-2 095 109 discloses improved water-dilutable formulations comprising a long-chain fatty alkanol which retards the evaporation of the water from the drops of the spray.

We have now found that still better evaporation retardation can be achieved if the Formulation satisfies the following Formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \text{Exp}\left[\frac{\ln\left(\frac{L}{4}\right) + C\ln(AX^B)}{C}\right]$$

where L is less than or equal to 15, A=700376, B=−1.5, C=0.8472

$M_{oil}$ is the weighted average relative molar mass of the oil phase

$M_{retardant}$ is the average molar mass of the retardant, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of oil phase which will dissolve the retardant, divided by the number of moles of retardant,

provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded.

For the avoidance of doubt, and to clarify any ambiguities which may arise in the printing or copying of this specification, it is to be noted that the relational symbol in the Formula is "less than or equal to" , "Exp" means the exponential of what follows in brackets, "in" means the natural logarithm, i.e. $\log_e$, L is divided by 4 , X is raised to the power B, B is a negative value (minus 1.51) and, in the definition of X, $M_{oil}$ is raised to the power 1.8.



The "oil phase" is the liquid non-aqueous phase and will comprise one or more of the active ingredient, the solvent therefor and the emulsifier.

Preferably L, which is related to the evaporation rate from the sprayed droplets, is less than 12, 10, or 8 and is most preferably less than 5. A distilled water spray has an "L" value of about 26, and most conventional diluted formulations have a value of about 22–30. In the formulations of the invention, "L" can be set at a desired value in order to calculate the required ratios of the ingredients. "L" can also be measured for a given formulation by the method described below.

The evaporation retardant may be any film-forming compound, preferably an alkanol. It is preferably a primary alcohol: preferably with no more than one or two side substitutions selected from methyl, ethyl, trifluoromethyl and halo (e.g. fluoro or chloro), with such substitutions preferably remote from the alcohol group (preferably at least 7 carbon atoms away from the hydroxyl group), and preferably the alkanol is not substituted at all: preferably $C_{16\text{-}20}$; preferably saturated: and preferably a solid at 27° Octadecan-1-ol and, particularly, hexadecan-1-ol are preferred. Hexadecan-1-ol (also known as cetyl alcohol) is usually available commercially as a mixture with a minor proportion of octadecan-1-ol (stearyl alcohol) and such "cetostearyl alcohol" is quite satisfactory. Heptadecan-1-ol performs adequately but is much more expensive. Other highly effective film-forming agents include 1-hexadecylamine, 1-heptadecylamine and 1-octadecylamine. Less preferred film-forming agents include hexadecan-2-ol, 1,2-hexadecandiol, methyl stearate, stearyl acetate, methyl palmirate and 1,2-octadecandiol. N-alkoxyalkanols may be used, for example $CH_3(CH_2)_{21}OC_2H_4OH$, $CH_3(CH_2)_{21}OC_3H_6OH$, $CH_3(CH_2)_{17}OC_2H_4OH$ or $CH_3(CH_2)_{15}OC_2H_4OH$, as may oxyethylene-docosanol and mixtures of any of the said evaporation retardants.

The emulsifier may be any suitable compound or mixture of compounds. Cationic emulsifiers can be used, but they tend to irritate the users' eyes. Anionic emulsifiers such as calcium dodecyl benzene sulphate (CDBS) or sodium diisopropyl naphthalene sulphonate (SDNS) can also be used, but these are not as effective at stabilizing the emulsion. Preferably, the emulsifier is a non-ionic compound, or mixture of non-ionic compounds, having an HLB (hydrophilic/lipophilic balance) of 8–18. Suitable compounds include polyoxyethylene stearyl ethers(PSE), polyoxyethylene monolaurates(PEM), polyoxyethylene mono-oleates (PMO), sorbitan mono-oleate (SMO), nonylphenol ethoxylate (NPE), polyethylene glycol (PEG) and blends of oleyl ethoxylate (10 mole) and PEG20 glyceryl oleate (OE/PGO).

These emulsifiers are available as follows:

| Abbrev | Trade name | Supplier |
|---|---|---|
| OE/PGO | Tegoplant EM11 | Th. Goldschmidt Ltd |
| PSE | Brij 72, Brij 76, Brij 78 | ICI Speciality Chemicals |
| PEM | Tween 20 | ICI Speciality Chemicals |
| SMO | Span 80 | ICI Speciality Chemicals |
| PMO | Tween 80 | ICI Speciality Chemicals |

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| Abbrev | Trade name | Supplier |
|---|---|---|
| NPE | Ethylan KEO, 55, BV | Lankro Chemicals Limited |
| CDBS | Arylan CA | Lankro Chemicals Limited |
| SDN | Aerosol OS | Cyanamid GB Ltd |

The solvent, at least for an oil-soluble active ingredient, preferably has a low relative molecular mass, namely less than about 200. Suitable compounds include lower alkyl esters, lower ketones, lower alkanols and lower alkanes, the term "lower" meaning $C_{1-10}$, preferably $C_{1-5}$.

Particular solvents include the following, all available from Exxon Chemicals Limited. "Solvesso 150"—An aromatic hydrocarbon solvent (C9 to C11) with a distillation range 190° to 210° C. "Solvesso 200"—An aromatic hydrocarbon solvent (C10 to C12) with a distillation range 226° to 290° C. "Exxate 700"—Heptyl acetate 99% pure, or odorless kerosene—A mixture of high boiling non-aromatic hydrocarbons consisting of paraffins and naphthenes with a distillation range of 180° to 270° C.

The formulation may comprise more than one active ingredient (optionally with a synergist or potentiator, which is regarded as an active ingredient for the purpose of the Formula above, more than one solvent, more than one emulsifier and/or more than one retardant, together with other ingredients such as perfumes, dyes, anti-foam agents, solids especially to form wettable powders) and thickeners. Some compounds, such as butane, propane and dichlorodifluoromethane and carbon dioxide are highly volatile and are used as propellants in pressure pack formations. Although sometimes acting as solvents for particular active ingredient, they almost instantly evaporate from the drops when sprayed and are thus excluded from the calculations in the Formula above. Such solvent/propellants are those which have no liquid phase at 27° C. at atmospheric pressure.

In a modification of the formulations of the invention, particularly pesticidal formulations which contain two incompatible pesticides, are useful. It has been found that an anhydrous formulation of a pesticide, i.e. one which does not contain an aqueous phase, may be formulated with a second immiscible phase which contains a second pesticide. This has the advantage that incompatible pesticides may be incorporated in the same formulation.

Accordingly to this modification, the invention provides a two-phase formulation, the first phase of which comprises a first active ingredient, a stabilizer, and optionally an emulsifier or wetting or dispersing agent, and a carrier or solvent for the active ingredient; and a second phase immiscible with the first phase which comprises a second active ingredient and optionally an emulsifier or wetting or dispersing agent and a carrier or solvent for the second active ingredient.

Normally, the first active ingredient is dissolved or dispersed into the first phase but when the active ingredient is a liquid, a solvent is not always required. The second phase which is immiscible with the first phase contains the second active ingredient either dissolved or dispersed in the second phase. Preferably, the first phase is a water immiscible phase and the second phase is a water phase.

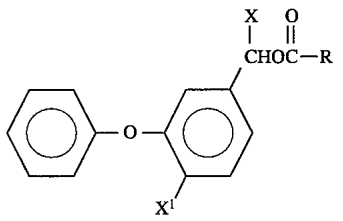
The first and second active ingredients are preferably physically and/or chemically incompatible when contained in a single phase, i.e. the presence of one of the actives in a formulation normally affects adversely the stability or utility of the other active. In addition, the active ingredient in the first phase may be one which has properties, for example



irritancy or noxious vapor, which may be avoided by formulating it according to the present invention. Thus, it may have been possible previously to prepare stable but irritant formulations of the active ingredients; formulations of the invention may avoid such irritancy.

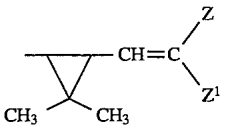
By active ingredient we mean both non-biologically and biologically active compounds. For example, the active ingredients may be selected from insecticides, acaricides, herbicides, fungicides, insect and plant growth regulators, pheromones, insect behavior modifiers, biological control agents (e.g. viruses, bacteria and eggs of parasites), dyes, perfumes, flavors, bactericides, lubricants, medicaments, food supplements, paints, polishes, lacquers (including hair lacquer), textile treatments (including sizes), or other active ingredients which are limited in their use by their incompatibility with other active ingredients. Examples of incompatible actives include combinations of pesticides selected from arthropodicides (insecticides, acaricides), herbicides, fungicides or insect and plant growth regulators. Examples of incompatible pesticides are the pyrethroids and organophosphate insecticides, the pyrethroid and formamidine insecticides, α-cyano-pyrethroid insecticides and thiazole anthelmintics, and pyrethroids and tributyl tin fungicides. Examples of incompatible pesticides are the pyrethroids and organophosphate insecticides, the pyrethroid and formamidine insecticides, α-cyano-pyrethroid insecticides and thiazole anthelmintics, and pyrethroids and tributyl tin fungicides.

Examples of pyrethroid insecticides include those of the formula (I)

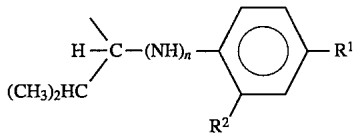



(I)

where R is

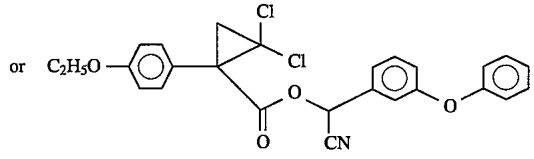



or




and n is 0 or 1,

$R^1$ is halo $CF_3$ or $CHF_2O$, $R^2$ is hydrogen or halo, and Z and $Z^1$ are each independently selected from halo, $CF_3$ and methyl, X is hydrogen or halo, and X is H, CN or C≡CH



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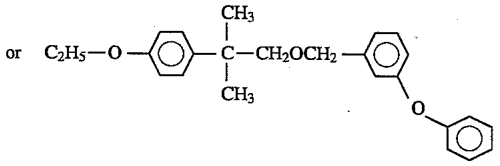

Examples of pyrethroids are 3-phenoxybenzyl-(1RS)-cis, trans-3-(2,2-dichlorovinyl- 2,2-di-methyl-cyclopropane-1-carboxylate (permethrin), (RS)-α-cyano-3-phenoxybenzyl-(1RS)-cis,trans-3-(2,2-dichlorovinyl)- 2,2-dimethylcyclopropane-1-carboxylate (cypermethrin) and its individual isomers such as the (1RS) cis isomer (alpha-methrin), (S)-α-cyano-3-phenoxybenzyl-(IR)-cis-3-(2,2-dibromovinyl)-2,2-dimethyl cyclopropane-1-carboxylate (deltamethrin), or a reaction mixture comprising two enantiomeric pairs in approximately ratio 2:3 (S)-α-cyano-3-phenoxybenzyl-(IR)-cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (R)-α-cyano-3-phenoxybenzyl (IS)-cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate with (S)-α-=cyano-3-phenoxybenzyl (IR)-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (R)-α-cyano-3-phenoxybenzyl(IS)-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate (beta-cypermethrin), (RS)-α-cyano-3-phenoxybenzyl-(Z)-(IRS)-cis-3-(2-chloro-3,3,3-trifluoro propenyl)-2,2-dimethylcyclopropanecarboxylate (cyhalothrin) and a mixture of its (S)(Z)-(IR)-cis and (R)(Z)-(IS)-cis-isomers; (RS)-α-cyano-3-phenoxybenzyl (RS)-2-(4-chlorophenyl)-3-methylbutyrate (fenvalerate) and the single (S), (S) isomer (esfenvalerate) (RS)-α-cyano-3-phenoxybenzyl (S)-2-(4-difluoromethoxyphenyl)-3-methyl butyrate (flucythinate), (RS)-α-cyano-3-phenoxybenzyl N(2-chloro-α, α,α -trifluoro-p-tolyl)-D-valinate(fluvalinate), (RS)-α-cyano-4-fluoro- 3-phenoxybenzyl(IRS)-cis-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxy late (cyfluthrin), (RS)-α-cyano-4-fluoro-3-phenoxybenzyl (IRS)-cis-trans-3-(2-chloro-2(4-chlorophenyl)vinyl)-2,,2-dimethylcyclopropanecarboxylate (flumethrin), 2-methylbiphenyl-3-yl-methyl(Z)-(IRS,3RS)-3RS)-3-(2-chloro-3,3,3-trifluoroprop-1-enyl)2,2-dimethyl-cyclopropane carboxylate (Bifenthrin); the allethrins, for example (1RS)-3-allyl-2-methyl-4-oxocylopent-2-enyl (1R, 3R)-2,2-dimethyl-3-(2-methylprop-1-enyl)cyclopropanecarboxylate (bioallethrin), (1S)-allyl-2-methyl-4-oxocyclopent-2-enyl (1R, 3R)-2,2-dimethyl-3-(2-methylprop-1-enyl)cyclopropanecarboxylate (S-bi-oallethrin), and mixtures of allethrin isomers (esbiothrin); the resmethrins, for example 5-benzyl-3-furylmethyl(IRS, 3RS; IRS, 3SR)-2,2-dimethyl-3-(2-methyl-prop-1-enyl)cyclopropanecarboxylate (resmethrin) and 5-benzyl-3-furylmethyl (1R,3R)-2,2-dimethyl-3-(2-methylprop-1-enyl)cyclopropanecarboxylate (bioresmethrin).

Examples of organophosphate insecticides are:

0,0-dimethyl-0-3,5,6-trichloro-2-pyridylphosphorothioate (Chloropyri-fos-methyl)

Examples of formamidine insecticides include N-methyl bis(2,4-xylylaminomethyl)amine (Amitraz). Examples of thiazole anthelmintics include 2,3,5,6-tetrahydro-6-phenylimidazo[2,1-b]thiazole(levamisole).

Examples of fungicides include tributyl tin oxide.

Particularly preferred examples of incompatible actives in the formulations of the present invention include deltamethrin and chlorpyrifos methyl in an aqueous system.

The first phase is preferably dispersed within the second phase. The stabilizer forms a barrier at the interface between the dispersed first phase and the second phase. The stabilizer



is preferably a film-forming alkanol e.g. an alkanol which can act as an evaporation retardant in an aqueous spray system as described in European Patent Specification 331474. It is preferably a primary alcohol; preferably with no more than one or two side substitutions selected from methyl, ethyl, trifluoromethyl and halo (e.g. fluoro or chloro), with such substitutions preferably remote from the alcohol group (preferably at least 7 carbon atoms away from the hydroxyl group), and preferably the alkanol is not substituted at all; preferably $C_{16-20}$; preferably saturated; and preferably a solid at 27° C., Octadecan-1-ol and, particularly, hexadecan-1-ol are preferred. Hexadecan-1-ol (also known as cetyl alcohol) is usually available commercially as a mixture with a minor proportion of octadecan-1-ol (stearyl alcohol) and such "cetostearyl alcohol" is quite satisfactory. Heptadecan-1-ol performs adequately but is much more expensive. Other highly effective film-forming agents include 1-hexadecylamine, 1-heptadecylamine and 1-octadecylamine. Less preferred film-forming agents include hexadecan-2-ol, 1,2-hexadecandiol, methyl stearate, stearyl acetate, methyl palmirate and 1,2-octadecandiol. N-alkoxyalkanols may be used, for example $CH_3(CH_2)_{21}OC_2H_4OH$, $CH_3(CH_2)_{21}OC_3H_6OH$, $CH_3(CH_2)_{CH17}OC_2H_4OH$ or $CH_3(CH_2)_{15}OC_2H_4OH$, as may oxyethylene-docosanol and mixtures of any of the said film-forming compounds.

The first phase may comprise more than one active ingredient (optionally with a synergist or potentiator, which is regarded as an active ingredient for the purpose of the Formula below), more than one solvent, more than one emulsifier and/or more than one stabilizer, together with other ingredients such as perfumes and dyes. $M_{oil}$, the average molecular weight of the oil phase, is the weight average, i.e. taking into account the relative proportions of the ingredients.

The value "Y", namely the molar solubility ratio of the formulation, may be derived empirically by making up at 40° C. a series of mixtures with different ratios of oil phase to alkanol, allowing the mixtures to cool to 27° C., leaving the cool mixtures for at least 48 hours at 27° C., and determining the amount, in moles, of the oil phase which is needed to dissolve completely a given amount of retardant, in moles. The former is then divided by the latter to give Y.

The formulations of the invention may be (i) single phase substantially anhydrous formulations, or (ii) emulsions comprising water. In a formulation of type (ii), some of the active ingredient, solvent or emulsifier components may partition into the aqueous phase, in which case such components are deemed not to be part of the oil phase in the Formula above. Examples of water-miscible solvents include ethanol, propanol, ethylene glycol and propylene glycol. It has been found that partially water-miscible components may be treated as being wholly water-miscible and hence excluded from the oil phase in the calculations.

When the formulation of the invention is diluted to give a sprayable preparation, the molar ratio of water to retardant should preferably not exceed about 9000, and preferably not exceed 8000, 7000 or 6000. It is perfectly possible to prepare a more dilute solution, but all that will happen is that the retardant will be unable to form a film over the entire surface of the droplets, and the water will evaporate until there is a sufficient concentration of the retardant to form a complete film which will then retard further evaporation. Thus, the droplet size is less controllable and, in addition, a larger volume of solution must be stored and pumped, which is inefficient.

The active ingredient of the one phase compositions may be an insecticide, acaricide, herbicide, fungicide, plant

growth regulator, insect behavior modifier, biological control agent (e.g. viruses, bacteria and eggs of parasites), dye, perfume, bactericide, lubricant, medicament, paint, polish, lacquer (including hair lacquer), textile treatment (including sizes), or any other compound to be sprayed in a water-based formulation. Sprays in accordance with the invention are particularly suitable for spraying buildings, residential or commercial areas and insect breeding grounds (such as stamps and other tracts of water) with insecticide and for spraying crops with herbicides, insecticides, fungicides and plant growth regulators.

Suitable pesticides including pyrethroids (such as permethrin, deltamethrin, cypermethrin (including alpha-methrin, the allethrins, fenvalerate and cyfluthrin), organophosphates (such as ethion, chlorfenvinphos, chlorpyrifos (methyl) or coumaphos), carbamates, organochlorines (such as DDT, dieldrin, dicofol, chlorpropylate or tetradifon), lipid amides, bicyclooctanes and dithianes. Suitable herbicides include glyphosate.

The sprays may be delivered by pumping through a nozzle, especially a sonic nozzle, by pumping over an ultrasonic nebulizer, or via a spinning disc. The droplets may be electro-statically charged, if desired.

As well as the uses discussed above, at least some of the formulations of the invention can be used to form a larvicidal Film over a lake.

To determine whether a given formulation satisfies the Formula given above, the following procedure may be adopted. If the formulation is an emulsion, the emulsion should first be "broken" by extraction of the concentrate with a suitable solvent such as ether. The ingredients are then analyzed by suitable quantitative and qualitative analytical methods. If not already known, the miscibility of each component with water is tested: if the component is water-miscible in the conditions of the Formulation, it is excluded From the calculations. The solubility of the evaporation retardant in the oil phase (excluding water-miscible components) is determined. The parameters are then operated on in the manner defined in the Formula to see whether the (mass of oil phase)/(mass of retardant) ratio is less than or equal to the figure on the right hand side of the Formula. This procedure is explained below with specific reference to the Examples.

In a preferred aspect, the first phase of the two phase formulation satisfies the formula:

$$\frac{\text{mass of oil phase}}{\text{mass of stabiliser}} \leqq \frac{M_{oil}}{M_{stabiliser}} \times \text{Exp}\left[\frac{\ln(L/4) + C\ln(AX^B)}{C}\right]$$

where L is less than or equal to 15, A=700376, B=−1.51, C=0.8472 $M_{oil}$ is the weighted average relative molar mass of the oil phase $M_{stabilizer}$ is the average molar mass of the stabilizer, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of oil phase which will dissolve the stabilizer, divided by the number of moles of stabilizer, provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded.

The "oil phase" is the liquid non aqueous phase and will comprise one or more of the active ingredient, the solvent therefor and in some cases the emulsifier.

Preferably L is less than 12, 10, or 8 and is most preferably less than 5. A distilled water spray has an "L" value of about 26, and most conventional diluted formulations have a value of about 22–30.

In the two phase formulations of the invention, "L" can be set at a desired value in order to calculate the required ratios of the ingredients.

Preferred film-forming compounds include $C_{16-20}$ saturated alkanols such as hexadecan-1-ol and $C_{16-18}$ saturated amines. Preferred emulsifiers and solvents for the first phase are as described hereinbefore for European Patent Specification 331474, which is incorporated herein by reference.

The use of the two phase formulations of the invention will be dependent upon the nature of the active ingredients included within the formulation but the formulations will commonly be used to control pesticidal infestations such as insect, acarine or helminth or microbial infestations. The application rate of the active ingredients will correspond to the application rates of these actives when applied conventionally for that particular use.

A preferred formulation of the present invention contains 20% of chloropyrifos methyl and 1% of deltamethrin, cetyl alcohol being the stabilizer. This formulation is useful for the treatment of stored crops such as grain, in particular, against insect pests, of the orders Coleoptera (e.g. Anobium, Ceutorhynchus, Rhynchophorus, Cosmopolites, Lissorhoptrus, Meligethes, Hypothenemus, Hylesinus, Acalymma, Lema, Psylliodes, Leptinotarsa, Gonocephalum, Agriotes, Dermolepida, Heteronychus, Phaedon, Tribolium, Sitophilus, Oryzaephilus, Rhyzopertha, Prostephanus, Cryptoletes, Trogoderma, Typheae, Diabrotica, Anthonomus or Anthrenus spp.), Lepidoptera (e.g. Ephestia, Mamestra, Earias, Pectinophora, Ostrinia, Trichoplusia, Pieris, Plodia, Sitotroga, Corcyra, Laphygma, Agrotis, Amathes, Wiseana, Tryporysa, Diatrae, Sporganothis, Cydia, Archips, Plutella, Chilo, Heliothis, Spodoptera or Tineola spp.), Diptera (e.g. Musca, Aedes, Anopheles, Culex, Glossina, Simulium, Stomoxys, Haematobia, Tabanus, Hydrotaea, Lucilia, Chrysomla, Callitroga, Dermatobia, Gasterophilus, Hypoderma, Hylemyia, Atherigona, Chlorops, Phytomyza, Ceratitis, Liriomyza and Melopbagus spp.), Phthiraptera (Malophaga e.g. Damalina spp. and Anoplura e.g. Linognathus and Haematopinus spp.), Hemiptera (e.g. Aphis, Bemisia, Photodon, Aeneolamia, Empoasca, Parkinsiella, Pyrilla, Aonidiella, coccus, Pseudococus, Helopeltis, Lygus, Dysdercus, Oxycarenus, Nezara, Aleurodes, Triatoma, Psylla, Mysus, Megourn, Pbylloxera, Adelyes, Niloparvata, Nephrotetix or Cimex spp.), Orthoptera (e.g. Locusta, Gryllus, Schistocerca or Acheta spp.), Dictyoptera (e.g. Blattella, Periplaneta or Blatta spp.) Hymenoptera (e.g. Athalia, Cephus, Atta, Solenopsls or Monomorium spp.), Isoptera (e.g. Odontotermes and Reticulitermes spp.), Siphonaptera (e.g. Ctencephalides or Pulex spp.), Thysanura (e.g. Lepisma spp.), Dermaptera (e.g. Forficula spp.), Pscoptera (e.g. Peripsocus spp.) and Thysanoptera (e.g. *Thrips tabaci*),. Acarine pests include ticks, e.g. members of the genera Boophilus, Ornithodorus, Rhipicephalus, Amblyomma, Hyalomma, Ixodes, Haemaphysalis, Dermacentor and Anocentor, and mites and manges such as Acarus, Tyrophagus, Glycyphagus, Tetranychus, Psoroptes, Notoednes, Sarcoptes, Psorergates, Choriоptes, Eutrombicula, Demodex, Panonycbus, Bryobia, Eriophyes, Blaniulus, Polyphagotarsonemus, Scutigerella, and Oniscus spp. and Periplaneta, Blatta, Blattella and Lapisma.

The two phase formulations may be prepared as follows:

1) The first active is dissolved in a solvent to form, or is itself, the first phase.

2) The stabilizer is dissolved into the first phase.

3) The second active ingredient is dispersed in part of the second phase.

4) The surfactants are dispersed either into the first phase or into the part of the second phase containing the second active ingredient.

5) The first phase is then dispersed into that part of the second phase that does not contain the second active ingredient.

6) The remainder of the second phase containing the second active ingredient is mixed with the mixture of the first phase and the other part of the second phase. Step (6) is not carried out under high sheer conditions. Therefore the second portion of the second phase simply combines with the first portion of the second phase and the end result is a first-phase-in-second-phase dispersion or emulsion.

In the following examples, there are described several preferred embodiments to illustrate the invention. However, it should be understood that the invention is not intended to be limited to the specific embodiments.

## EXAMPLE 1A

A ULV insecticide formulation was made up of the following components.

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 10.32 | 391 |
| S-Bioallethrin | 1.51 | 302 |
| Piperonyl Butoxide | 11.32 | 338 |
| Odorless kerosene | 9.30 | 170 |
| Hexadecan-1-ol | 3.00 | 242 |
| Emulsifiers | | |
| Tegoplant EM11 | 0.75 | |
| Brij 76 | 0.24 | |
| Tween 20 | 0.01 | |
| Aqueous phase | | |
| Water | 63.45 | 18 |
| Silcolapse 5000 | 0.10 | |
| "Silcolapse" is a Regd. T.M. | | |

The concentrate was diluted in 1+9 parts with water for application. The average relative molar mass of oil phase= 271 and the molar solubility ratio (moles oil phase/moles alkanol)=9.4.

Model prediction: ratio (mass oil phase/mass of alkanol) of a formulation within the scope of the invention:

Maximum ratio with an evaporation rate (L) of 15=27.5 with L of 10=17 and with L of 5=7. Hence, the invention encompasses all such formulations where the mass ratio for this solvent/pesticide mixture to hexadecan-1-ol is less than or equal to 27.

The above formulation has the ratio (mass of oil phase/mass of alkanol)=10.8 and the ratio (moles water/moles of alkanol)=4318 when diluted. Observed average evaporation rate (L)=3.8.

## EXAMPLE 1B

A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 10.87 | 391 |
| S-Bioallethrin | 0.15 | 302 |
| Piperonyl Butoxide | 11.07 | 338 |
| Odorless kerosene | 9.30 | 170 |
| Hexadecan-1-ol | 3.00 | 242 |
| Emulsifiers | | |
| Tegoplant EM11 | 0.75 | |
| Brij 76 | 0.24 | |
| Tween 20 | 0.01 | |
| Aqueous phase | | |
| Water | 64.51 | 18 |
| Silcolapse 5000 | 0.10 | |
| "Silcolapse" is a Regd. T.M. | | |

## EXAMPLE 2A

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Delamethrin | 1.0 | 505 |
| Heptyl acetate (Exxate 700) [Exxon Chemicals] | 30.0 | 158 |
| Hexadecan-1-ol | 5.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |
| Silcolapse 5000 (anti foam agent) | 0.1 | — |
| Water | 62.9 | 18 |

The concentrate was diluted in 1+19 parts with water for spray application and the parameters for these and the subsequent Examples are given in Table 1.

## EXAMPLE 3

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Alpha cypermethrin | 2.0 | 416 |
| Heptyl acetate (Exxate 700) [Exxon Chemicals] | 30.0 | 158 |
| Hexadecan-1-ol | 7.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 0.1 | 800 |
| Aqueous phase | | |
| Water | 60.0 | 18 |
| Observed average evaporation rate = 4.5 | | |

## EXAMPLE 4

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 25.0 | 391 |
| 4-methylpentan-2-one | 32.0 | 100 |
| Hexadecan-1-ol | 6.0 | 242 |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Propan-2-ol | 32.0 | — * |
| Emulsifiers | | |
| Tween 80 | 3.6 | |
| Span 80 | 1.4 | |

* assumed to partition mostly into the aqueous phase on dilution as it was water-miscible. This formulation was found to be particularly effective.

## EXAMPLE 4B

A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Permethrin | 25.0 | 391 |
| Hexadecan-1-ol | 6.0 | 242 |
| Emulsifiers | | |
| PMO | 3.6 | |
| SMO | 1.4 | |
| Aqueous phase | none | |

## EXAMPLE 5

A pressure packed insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Bioallethrin | 0.315 | 302 |
| Permethrin | 0.038 | 391 |
| Odorless kerosene | 8.3 | 170 |
| Butane | 40.0 | — * |
| Hexadecan-1-ol | 1.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |
| Water | 50.347 | 18 |

* excluded due to its volatility (vapor at normal temperatures and pressures)

## EXAMPLE 6

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Pyrethrins (PY) | 2.0 | 350 |
| Solvent in PY extract | 6.0 | 150 |
| Piperonyl Butoxide | 16.0 | 338 |
| Octadecan-1-ol | 2.5 | 270 |
| Emulsifier | | |
| Tegoplant EM11 | 1.0 | 800 |
| Aqueous phase | | |
| Water | 72.4 | 18 |
| Silcolapse 5000 | 0.1 | — |



Ready use concentrate (no further dilution required).

## EXAMPLE 7

A ULV insecticide formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Chlorpyrifos-methyl | 20.0 | 323.0 |
| Solvesso 150 [Exxon Chemicals] | 20.0 | 144.0 |
| Hexadecan-1-ol | 3.0 | 242 |
| Emulsifier | | |
| Tegoplant EM11 | 2.0 | — |
| Aqueous phase | | |
| Water | 54.9 | 18 |
| Silcolapse 5000 | 0.1 | — |

## EXAMPLE 8

A wettable powder formulation

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Inorganic carrier | | |
| Celite 204 | 64.0 | — |
| Oil phase | | |
| Permethrin | 25.0 | 391 |
| Hexadecan-1-ol | 6.0 | 141 |
| Emulsifiers/dispersing agents | | |
| Tegoplant EM11 | 1.0 | |
| Sodium diisopropyl naphthalene sulfonate e.g. Aerosol OS [Cyanamid G.B. Ltd.] | 4.0 | |

## EXAMPLE 9

A ULV herbicide formulation (containing a water soluble herbicide).

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 200 | 10.0 | 163.0 |
| Hexadecan-1-ol | 3.0 | 242 |
| Emulsifiers | | |
| Span 80 | 6.6 | |
| Tween 80 | 3.4 | |
| Aqueous phase | | |
| Water | 40.0 | 18 |
| Glyphosate-mono isopropylammonium | 36.9 | |

This formulation may be modified for other water-miscible active ingredients, for example the components of Bordeaux mixture or quaternary ammonium compounds.

EXAMPLE 10

An LV synergist spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Piperonyl butoxide | 64.0 | 338 |
| Hexadecan-1-ol | 7.5 | 242 |
| Emulsifiers | | |
| NPE 80 | | 7.0 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Propan-2-ol | 21.5 | |

EXAMPLE 11

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 150 | 8.8 | 144 |
| Hexadecan-1-ol | 1.2 | 242 |
| Emulsifiers | | |
| SMO | | 0.3 |
| PMO | | 0.9 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Dimethoate | 80.0 | |
| Propan-2-ol | 8.8 | |

EXAMPLE 12

A wettable powder insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 150 | 25.0 | 144 |
| Hexadecan-1-ol | 5.0 | 242 |
| Emulsifiers | | |
| SDNS | | 7.5 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Diflubenzuron | 25.0 | |
| Mineral silicates | 37.5 | |

EXAMPLE 13

A flowable fungicide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Solvesso 150 | 15.0 | 144 |
| Hexadecan-1-ol | 6.0 | 242 |
| Emulsifiers | | |
| SMO | | 1.4 |
| PMO | | 3.6 |
| Aqueous phase | | |

-continued

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Water (pH = 13) | 48.9 | 18 |
| Sodium hydroxide | 0.1 | |
| 1,2 propandiol | 4.0 | |
| Inert/Water Soluble ingredients | | |
| Thiabendazole | 20.0 | |
| Xanthan gum | 0.5 | |
| Mineral silicates | 0.5 | |

EXAMPLE 14

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Exxate 700 | 5.0 | 158 |
| Hexadecan-1-ol | 4.0 | 242 |
| Emulsifiers | | |
| OE/PGO | 2.4 | |
| Aqueous phase | none | |

EXAMPLE 15

A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Cypermethrin | 10.0 | 416 |
| Solvesso 150 | 40.0 | 144 |
| Hexadecan-1-ol | 4.0 | 242 |
| Emulsifiers | | |
| OE/PGO | 2.0 | |
| Aqueous phase | | |
| Water | 44.0 | |
| Inert/Water Soluble ingredients | none | |

EXAMPLE 16

A ULV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Methoprene | 28.0 | 311 |
| Solvesso 150 | 28.0 | 144 |
| Hexadecan-1-ol | 7.0 | 242 |
| Emulsifiers | | |
| NPE | | 4.0 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Propan-2-ol | 33.0 | |

EXAMPLE 17

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Amitraz | 18.0 | 293 |
| Solvesso 150 | 36.0 | 144 |
| 1-Hexadecylamine | 16.3 | 242 |
| Emulsifiers | | |
| SMO | | 1.8 |
| PMO | | 4.5 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Propan-2-ol | 23.4 | |

EXAMPLE 18

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Malathion | 65.0 | 330 |
| Hexadecan-1-ol | 7.5 | 242 |
| Emulsifiers | | |
| SMO | | 2.0 |
| PMO | | 5.0 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Propan-2-ol | 20.5 | |

EXAMPLE 19

An LV insecticide spray

| | % mass/mass | Rel. molar mass |
|---|---|---|
| Oil phase | | |
| Fenitrothion | 65.0 | 277 |
| Hexadecan-1-ol | 4.0 | 242 |
| Emulsifiers | | |
| SMO | | 2.0 |
| PMO | | 5.0 |
| Aqueous phase | none | |
| Inert/Water Soluble ingredients | | |
| Propan-2-ol | 24.0 | |

COMPARATIVE EXAMPLE A (A ULV INSECTICIDE FORMULATION).

| Oil phase | % mass/mass | Rel. molar mass |
|---|---|---|
| Permethrin | 10.8 | 391 |
| S-Bioallethrin | 1.7 | 302 |
| Piperonyl Butoxide | 12.3 | 338 |
| Mineral Oil | 20.0 | 296 |
| Kerosene | 41.7 | 170 |
| Hexadecan-1-ol | 1.0 | 242 |
| Nonylphenol ethylene oxide condensate** | 8.2 | 638 |
| Calcium dodecyl benzenesulfonate** | 4.3 | 394 |

**emulsifiers assumed to partition mostly into aqueous phase on dilution.

Diluted 1+9 with water for application and the average relative molar mass of oil phase=254. The molar solubility ratio (moles oil phase/moles long chain alcohol)=10.0.

Model prediction ratio (mass of oil phase/mass of alkanol) of a formulation within the scope of the invention:

Maximum ratio with an evaporation rate (L) of 15 units=33.0, with an L of 10 units=20.4, and with an L of 5 units=9.0. The above formulation had the ratio (moles of oil phase/moles long chain alcohol)=86, and was therefore outside the scope of the invention. The ratio (moles of water/moles of alkanol)=12100 on dilution. Observed average evaporation rate=20 units

* Example 1 of GB-A-2 095 109.

ANALYSIS OF FORMULATIONS

The analysis of a given formulation to determine whether it satisfies the formula above is illustrated as follows:

Analysis of Example 1A:

The permethrin, S-bioallethrin, piperonyl butoxide, odorless kerosene, emulsifiers and antifoam agent constitute the oil phase and each one of these components may be taken in turn at the level in the formulation and diluted in water (%1+9). One could observe that the permethrin, S-bioallethrin, odorless kerosene and piperonyl butoxide were not miscible with water at this dilution level, e.g. permethrin has a solubility of 0.2 mg/l of water at 30° C. These components therefore constitute the oil phase. The emulsifiers would be miscible with water giving a clear solution upon dilution. Of the antifoam agent, (0.1%) 30% of this would not be soluble in the oil phase or the water and would simply be classed as an inert ingredient. The oil phase would then be constituted in the proportions in the formulation. The solubility limit of hexadecan-1-ol was determined by preparing a series of mixtures and noting the maximum composition at which all the hexadecan-1-ol remained in solution at 27° C. after a period of 24 hours. A mixture containing 8.7% mass/mass of hexadecan-1-ol was the composition in this case. The relative molar mass of the oil phase was also required and this was calculated as follows from the relative molar mass of each component and the proportions in the oil phase:

$$\frac{10\,32}{391}+\frac{1.51}{302}+\frac{11.32}{338}+\frac{9.30}{170}=\frac{32.45}{RMM\ \text{mixture}}$$

$RMM$ mixture = 271

The relative molar mass of hexadecan-1-ol was 242. The molar solubility ratio (moles oil phase/moles film forming agent)

$$=((100-8.7)/271)/(8.7/242)=9.37$$

This provided all the variables to use in the right hand side of the equation. With L=15, the predicted maximum ratio of mass oil phase of film forming agent was 27. The above formulation had a mass oil phase to film forming agent of 10.8 (33.45/3). Therefore, it was clearly within the scope of the formula. The level of hexadecan-1-ol could be reduced to 1.21% with the same level of oil phase and still remained with the scope of the formula. However, a formulation with 1.0% hexadecan-1-ol would be outside the scope of the formula.

Analysis of Example 4A:

This formulation contained permethrin, 4-methylpentan-2-one, hexadecan-1-ol, emulsifiers and propan-2-ol and the formulation was diluted 1+9 parts with water for use.

All the components given could potentially constitute the oil phase, once diluted. Propan-2-ol was completely miscible with water over all compositions and the emulsifiers were also water miscible when diluted. The permethrin and 4-methyl pentan-2-one were not completely miscible with water when diluted at this level and the oil phase therefore consisted of permethrin and 4-methyl-pentan- 2-one. The solubility of hexadecan-1-ol was determined in this mixture as described above at 27° C. The solubility of hexadecan-1-ol in the mixture of permethrin and 4-methylpentan-2-one was 16.0% mass/mass and the relative molar mass of the oil phase was calculated from the relative molar mass of the components and their proportion in the oil phase:

$$\frac{25.0}{391}+\frac{32.0}{100}=\frac{87.0}{RMM\ \text{mixture}}$$

$$RMM\ \text{mixture}=149$$

The relative molar mass of hexadecan-1-ol was 242 and the molar solubility ratio (moles oil phase/moles film forming agent)

$$=([100-16.11)/149)/(16/242)=8.5$$

This gave all the variables to be used on the right hand side of the equation. With L=15, then the maximum ratio of oil phase to hexadecan-1-ol was 66. The above formulation had a mass ratio of oil phase to film-forming agent of 9.5 and was well within the scope of the formula. The level of hexadecan-1-ol could be reduced to 0.87% while maintaining the oil phase levels constant and still remained within the scope of the formula.



Analysis of Example 4B:

It will be observed that this formulation was the same as that given as Example 4A except that the formulation was diluted 1+29 parts with water. Permethrin was the only component within the formulation that was immiscible with water at this level of dilution. 0.32 g of 4-methyl-pentan-2-one dissolved completely in 29 g of water and the permethrin in this example constituted the oil phase. The solubility of hexadecan-1-ol in permethrin was 1.8% w/w which gave a molar solubility ratio of 33.7.

With L=15, the maximum ratio of oil phase to film-forming agent was 99. At this dilution level, the level of hexadecan-1-ol in the formulation could be reduced to 0.4% and still remained within the scope of the formula. This also provided an example of where the evaporation rate of a formulation was improved as a result of further dilution because of additional partitioning of one of the oil phase components in the aqueous phase. There was less oil phase for the film forming agent to dissolve in, thus more was available to form a film at the surface of the droplet.

Analysis of Example 13:

This formulation contained Solvesso 150, hexadecan-1-ol, emulsifiers, water, sodium hydroxide, 1,2-propandiol, thiabendazole, xanthan gum, and mineral silicates which was a fairly complex formulation. The active ingredient was not particularly soluble in the aqueous or oil phase and a fine particulate suspension of the active ingredient was therefore made. The formulation also contained a thickening agent to aid the suspension of the particulates. This was a high molecular weight polysaccharide that was insoluble in the oil phase and it can be regarded as an inert substance. The formulation also contained powered mineral silicates of low bulk density to prevent the formulation from "caking" (particles sticking together). The 1,2-propandiol was added to prevent freezing and was completely water miscible. The sodium hydroxide was added to buffer the formulation at around a pH of 13 and was water soluble. The oil phase consisted of only Solvesso 150 with possibly a small amount of thiabendazole dissolved in it.

The solubility of hexadecan-1-ol in Solvesso 150 was 23.5% mass/mass and the relative molar mass of Solvesso 150 was 144. The molar solubility was 5.5. The right hand side of the formula with L=15, gave a ratio (mass of oil phase/mass of film forming agent)=35. The formulation had a mass ratio of 2.5 and was clearly within the scope of the formula. The level of hexadecan-1-ol could be reduced substantially and the formulation remained within the scope of the formula.

TABLE 1

| Example No: | 1A | 1B | 2 | 3 | 4A | 4B | 5 |
|---|---|---|---|---|---|---|---|
| Dilution for appln. 1 + n | 9 | 9 | 19 | 29 | 9 | 29 | 0 |
| Av. Rel. Molar mass of oil phase | 271 | 271 | 162 | 164 | 149 | 391 | 173 |
| Mass solubility | 8.7 | 8.7 | 16.5 | 16.5 | 16.0 | 1.8 | 7.5 |
| Molar solubility ratio | 9.4 | 9.4 | 7.6 | 7.5 | 8.5 | 33.7 | 17.2 |
| Maximum ratio | | | | | | | |

TABLE 1-continued

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| calcd. for L | | | | | | | |
| L = 15 | 27 | 27 | 47 | 45 | 66 | 99 | 145 |
| L = 10 | 17 | 17 | 29 | 28 | 41 | 61 | 90 |
| L = 5 | 7 | 7 | 13 | 12 | 18 | 27 | 40 |
| Mass of oil | 10.8 | 10.5 | 6.2 | 4.6 | 9.5 | 9.5 | 8.6 |
| Mass of film-former | | | | | | | |
| L measured | 3.8 | 3.8 | 4.0 | 4.5 | 5.0 | 4.2 | 3.8 |
| Moles (water) | 4318 | 5278 | 5278 | 5685 | 2016 | 6498 | 663 |
| Moles (film-former) | | | | | | | |
| Example No. | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Dilution for | 0 | 14 | 39 | 39 | 39 | 29 | 39 |
| appln. 1 + n | | | | | | | |
| Av. Rel. Molar | 258 | 199 | 391 | 153 | 338 | 144 | 144 |
| mass of oil phase | | | | | | | |
| Mass solubility | 4.0 | 9.0 | 1.8 | 12.5 | 5.5 | 23.5 | 23.5 |
| Molar solubility | 25.1 | 12.2 | 33.7 | 10.4 | 12.3 | 5.5 | 5.5 |
| ratio | | | | | | | |
| Maximum ratio | | | | | | | |
| calcd. for L | | | | | | | |
| L = 15 | 116 | 68 | 99 | 75 | 28 | 35 | 35 |
| L = 10 | 72 | 42 | 61 | 47 | 17 | 22 | 22 |
| L = 5 | 32 | 19 | 99 | 21 | 8 | 10 | 10 |
| Mass of oil | 2.5 | 9.6 | 13.3 | 8.5 | 8.5 | 5.0 | 5.0 |
| Mass of film-former | | | | | | | |
| L measured | 4.8 | 4.7 | 5.3 | 3.8 | 5.3 | 7.5 | 7.0 |
| Moles (water) | 435 | 6520 | 6691 | 32490 | 6991 | 11089 | 10487 |
| Moles (film-former) | | | | | | | |
| Example No. | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Dilution for | 49 | 19 | 19 | 19 | 19 | 19 | 19 |
| appln. 1 + n | | | | | | | |
| Av. Rel. Molar | 144 | 158 | 166 | 197 | 173 | 330 | 277 |
| mass of oil phase | | | | | | | |
| Mass solubility | 23.5 | 16.5 | 15.0 | 18.5 | 20.1 | 1.9 | 0.8 |
| Molar solubility | 5.5 | 7.8 | 8.2 | 5.4 | 5.5 | 37.8 | 108 |
| ratio | | | | | | | |
| Maximum ratio | | | | | | | |
| calcd. for L | | | | | | | |
| L = 15 | 35 | 51 | 52 | 20 | 26 | 157 | 1038 |
| L = 10 | 22 | 32 | 32 | 13 | 16 | 97 | 643 |
| L = 5 | 10 | 14 | 14 | 6 | 7 | 43 | 284 |
| Mass of oil | 2.5 | 1.3 | 12.5 | 8.0 | 3.3 | 8.7 | 16.3 |
| Mass of film-former | | | | | | | |
| L measured | 7.5 | 7.3 | 4.7 | 7.8 | 4.5 | 6.4 | 5.1 |
| Moles (water) | 11089 | 9747 | 6534 | 3649 | 1567 | 3402 | 6386 |
| Moles (film-former) | | | | | | | |

## EXAMPLE 20

Formulations

| Ingredients | % w/w |
|---|---|
| chlorpyrifos methyl | 19.15 |
| solvesso 150 | 19.15 |
| water (deionised) | 51.40 |
| emulsifiers | 2.00 |
| Deltamethrin (20% SC) | 5.20 |

The deltamethrin (20% SC) contained deltamethrin (20%) in water with surfactant, thickening agents and biological preservative. The oil phase was prepared by dissolving cetyl alcohol in a solution of chlorpyrifos methyl in Solvesso 150 at a temperature up to 50° C. The emulsifiers were added to the water at 60° C. and the resultant aqueous solution was cooled to 50° C. (aqueous phase). The oil phase was added to the aqueous phase at 50° C. with vigorous mixing and the resultant emulsion was cooled to 20° C. A 20% aqueous suspension of deltamethrin was added with stirring at 20°–25° C.

## EXAMPLE 21

Stability Testing

Tests were carried out on the stability of active ingredients in a formulation of the present invention (A) and in a two phase formulation that did not contain stabilizer (B).

Formulation A Results

A chlorpyrifos methyl/deltamethrin formulation with film-forming agent was prepared in a similar manner to Example 20 above.

Typical Stability Data: chlorpyrifos methyl (CPMe) tests (figures±10%)

| Time in months (M) | 25° C. | 38° C. | 50° C. |
|---|---|---|---|
| Initial | 100 | 100 | 100 |
| 3 M or 4 M | 101 | 103 | 103 |

-continued

| | | | |
|---|---|---|---|
| 6 M | 102 | 100 | 103 |
| 12 M | 101 | 94 | 101 |

Typical Stability Data: Deltamethrin (DLTM)

| Time in months (M) | 25° C. | 38° C. | 50° C. |
|---|---|---|---|
| Initial | 100 | 100 | 100 |
| 3 M or 4 M | 96 | 99 | 98 |
| 6 M | 97 | 103 | 103 |
| 12 M | 98 | 94 | 76 |

Formulations B—results

A chlorpyrifos methyl/Deltamethrin Formulation without film forming agent.

Typical Stability Data: CPME

| Time in months (M) | 25° C. | 38° C. | 50° C. |
|---|---|---|---|
| Initial | 100 | 100 | 100 |
| 3 M | 112 | 106 | 71 |

Typical Stability Data: DLTM

| Time in months (M) | 25° C. | 38° C. | 50° C. |
|---|---|---|---|
| Initial | 100 | 100 | 100 |
| 3 M | 75 | 75 | 16 |

The results show formulations (B) without film forming agent are relatively unstable.

## EXAMPLE 22

Biological Testing

Protocol: An appropriately water-diluted formulation was sprayed on to 400 tons of grain at Wail, Victoria. It was applied to the grain stream during turning at one liter of spray per ton. Treated grain was sampled at intervals by a vacuum probe and bioassays were conducted by holding 100 adult insects on 150 g or 300 g of grain. After 3 weeks of incubation at 25° C. and 55–60% relative humidity, the insects were sieved off and mortality counted. The grain was further sieved at 7, 9, and 11 weeks to remove and mortality count adult progeny.

(1) 0.24; 4.9 mg/kg deltamethrin; chlorpyrifos-methyl

| Insects tested | Months of post-treatment storage | % Mortality | Progeny numbers living | Progeny numbers dead | Progeny suppression % |
|---|---|---|---|---|---|
| *Sitophilus oryzae* | 0 | 100 | 0 | 4 | 99.8 |
| | 1.5 | 100 | 0 | 0 | 100 |
| | 3 | 100 | 0 | 0 | 100 |
| | 4.5 | 100 | 0 | 0 | 100 |
| | 6 | 100 | 0 | 0 | 100 |
| | 9 | 100 | 0 | 0 | 100 |
| *Rhyzopertha dominica* | 0 | 100 | 0 | 0 | 100 |
| | 1.5 | 100 | 0 | 0 | 100 |
| | 3 | 100 | 0 | 0 | 100 |
| | 4.5 | 100 | 0 | 0 | 100 |
| | 6 | 100 | 0 | 0 | 100 |
| | 9 | 100 | 0 | 0 | 100 |
| *Tribolium castaneum* | 0 | 100 | 0 | 0 | 100 |
| | 1.5 | 100 | 0 | 1 | 99.7 |
| | 3 | 100 | 0 | 0 | 100 |
| | 4.5 | 100 | 0 | 1 | 99.5 |
| | 6 | 100 | 0 | 4 | 99.0 |
| | 9 | 100 | 0 | 0 | 100 |
| Queensland *Tribolium castaneum* | 0 | 100 | 0 | 0 | 100 |
| | 1.5 | 100 | 0 | 2 | 97 |
| | 3 | 99 | 0 | 0 | 100 |
| | 4.5 | 99 | 0 | 1 | 99.7 |

(1) 0.24; 4.9 mg/kg deltamethrin; chlorpyrifos-methyl

| Insects tested | Months of post-treatment storage | % Mortality | Progeny numbers living | Progeny numbers dead | Progeny suppression % |
|---|---|---|---|---|---|
| | 6 | 100 | 0 | 4 | 99.0 |
| | 9 | 95 | 0 | 0 | 100 |

Results show good control of insect pests for post-treatment storage up to 9 months,

Various modifications of the compositions and method of the invention may be made without departing from the spirit or scope thereof and it is to be understood that the invention is intended to be limited only as defined in the appended claims.

What we claim is:

**1**. Formulation suitable for spraying or for dilution with water to form a sprayable preparation, the formulation comprising an active ingredient, optionally a carrier or solvent for the active ingredient, an emulsifier and an evaporation retardant, characterized in that the formulation satisfies the following Formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leqq \frac{M_{oil}}{M_{retardant}} \times \text{Exp}\left[\frac{\ln\left(\frac{L}{4}\right) + C\ln(AX^B)}{C}\right]$$

where L is less than or equal to 15, A: 700376, B=–1.51, C=0.8472,

$H_{oil}$ is the weighted average relative molar mass of the oil phase,

$M_{retardant}$ is the weighted average relative molar mass of the retardant, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of the oil phase which will dissolve the retardant, divided by the number of moles of retardant,

provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded.

**2**. A Formulation according to claim **1** wherein L is less than 10.

**3**. A formulation according to claim **2** wherein L is less than 5.

**4**. A Formulation according claim **1** wherein the active ingredient is a pesticide or herbicide.

**5**. A formulation according to claim **4** wherein the active ingredient is a pyrethroid.

**6**. A formulation according to claim **1** where in the solvent has a relative molar mass of less than 200.

**7**. A formulation according to claim **6** herein the solvent comprises kerosene, odorless kerosene, mineral oil, heptyl acetate, 4 -methylpentan-2-one or butane.

**8**. A formulation according claim **1** wherein the formulation is an -ultra low volume concentrate and the proportion of the oil phase is between 8% and 30% by mass before dilution for use.

**9**. A formulation according to claim **1** wherein the formulation is a wettable power.

10. A formulation according to claim 1 wherein the evaporation retardant is hexadecan- 1-ol or a mixture of hexadecan-1-ol and octadecan-1-ol.

11. A formulation according claim 10 which is to be diluted before use and which comprises from 1.0 to 7.5% evaporation retardant by mass.

12. A formulation according to claim 1 wherein the emulsifier is a non-ionic compound with an HLB value of 8–18, or a mixture of non-ionic compounds, the mixture having a weighted average HLB value of 8–18.

13. A formulation according to claim 1 which is diluted and ready for use and which comprises 0.0 to 3.2% oil phase by weight.

14. A formulation according to claim 13 which is diluted and ready for use and which comprises 0.25 to 1.5% oil phase by weight.

15. A method of combating insect or acarine pests or unwanted plants by spraying a formulation of claim 1, optionally diluted with water, wherein the formulation comprises an insecticide, acaricide or herbicide.

16. A pesticidal formulation comprising a two phase formulation, the first phase of which is water immiscible and comprises a first active ingredient, a stabilizer, and optionally an emulsifier or wetting or dispersing agent, and a carrier or solvent for the active ingredient; and a second phase immiscible with the first phase which is water and comprises a second active ingredient and optionally an emulsifier or wetting or dispersing agent and a carrier or solvent for the second active ingredient, wherein the first phase of the formulation satisfies the formula:

$$\frac{\text{mass of oil phase}}{\text{mass of stabiliser}} \leqq \frac{M_{oil}}{M_{stabiliser}} \times \text{Exp}\left[\frac{\ln(L/4) + C\ln(AX^B)}{C}\right]$$

where L is less than or equal to 15, A=700376, B=–1.51. C= 0.8472

$M_{oil}$ is the weighted average relative molar mass of the oil phase $M_{stabilizer}$ is the average molar mass of the stabilizer, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of oil phase which will dissolve the stabilizer, divided by the number of moles of stabilizer, provided that, in the formula above, any solvent which has no liquid phase at 27° C. at atmosphere pressure is excluded.

17. A pesticidal formulation according to claim 16 wherein L is less than 5.

18. A pesticidal formulation according to claim 16 wherein the stabilizer is a $C_{16-20}$ saturated alkanol, or $C_{16-18}$ saturated amine.

* * * * *

LJA ENGINEERING

905 Orleans, Beaumont, Texas 77701
t 409.813.1862 f 409.813.1916 LJA.com TBPE F-1386 TBPLS 10000600

PROF 17-022/JW

June 1, 2017 PROPOSAL

Ms. Deborah Syphrett-Clark
Purchasing Agent
Purchasing Department
1149 Pearl Street
Beaumont, Texas 77701

Re: (RFQ 16-005/JW) Engineering Services for Jefferson County Sheriff's Department
Hangar at Jack Brooks Regional Airport – Reduced Building Size
LJA Project No. 079-1013A
Proposal No. 17-01129

Dear Ms. Clark:

LJA Engineering, Inc. ("LJA") is pleased to provide this proposal to Jefferson County, Texas, ("Client") for professional engineering services for the referenced project. We understand that the Client intends to construct a new hangar/storage building at the Jack Brooks Regional Airport. Previously LJA prepared drawings and specifications for a 60'x100' pre-engineered metal building structure. Due to some additions made during detailed design and unforeseen utility work required, the bid estimates received for the original design exceeded the available funds for project. Therefore, the county would like to scale back the building and re-issue for bid. LJA proposes to revise and reissue construction documents and specifications in accordance with the changes requested by the county.

LJA's deliverables will include a complete revised set of construction documents and specifications.

We propose to provide this scope of services for a lump sum amount of $6,900. If this proposal meets with your approval, please execute and return a copy to our office. Your signature below will be sufficient authorization to commence the stated work.

We appreciate the opportunity to submit this proposal and look forward to working with you on this project. If you should have any questions, please do not hesitate to call me at 409.291.5362.

Sincerely,

Heath E. Reynolds, PE
Project Manager

Robin Warrick, PE
Project Manager

HER/sp

**APPROVED FOR JEFFERSON COUNTY TEXAS**

By: _____

Name: Jeff R. Branick

Title: Jefferson County Judge

Date: June 26, 2017

ATTEST _____, Chief Deputy
DATE 6/26/17

COMMISSIONERS COURT JEFFERSON COUNTY, TEXAS

L:\Projects\079 (Jefferson County Engineering Dept)\079-1013A (JCSO Hangar Building - Revised Bldg Size)\Project Management\Proposal 17-01129.docx

# FAUST Engineering and Surveying, Inc.

PROF 17-023/JW

Professional Engineers and Professional Surveyors
E-MAIL ADDRESS INFO@FAUSTENG.COM
2525 Calder Street
Beaumont, Texas 77702
Surveying Firm Registration No. 100024-00
Engineering Firm Registration No. 4800

Telephone (409) 813-3410
Fax (409) 813-3484

June 16, 2017

**Commissioner Everette Alfred**
**Jefferson County Precinct 4**
**Jefferson County Courthouse**
**1149 Pearl Street**
**Beaumont, Texas 77701**

**Dear Commissioner Alfred:**

**Re: Jefferson County Assistance District**

Faust Engineering and Surveying, Inc., is pleased to provide this proposal for surveying services for the creation of the Jefferson County Assistance District. Our services will include the following:

- Development of a drawing on a 8 1/2" x 11" sheet giving a pictorial representation of the proposed district
- Preparation of a legal description of the proposed district utilizing deed references and general directions of the district lines (Description will be based on property information researched at the Jefferson County Appraisal District.)

Faust Engineering and Surveying, Inc., proposes to provide the above-referenced services for a fee of $2,500.

We appreciate the opportunity to provide this proposal and look forward to working with you on this project. If you have any questions or need additional information in this matter, I may be reached by telephone at 409-813-3410.

For The Firm,

Richard F. Faust

Richard F. Faust, P.E.
President

COMMISSIONERS COURT
JEFFERSON COUNTY, TEXAS

Accepted By _____ Date June 26, 2017
Jeff R. Branick, Jefferson County Judge

ATTEST _____, Chief Deputy
DATE 6/26/17

Jefferson County Assistance District

# MEMO

To: Ms. Fran Lee, Auditing

From: Commissioner Everette Alfred, Precinct #4

Date: June 20, 2017

RE: Transfer Funds

Please transfer **$2,000** from account # 114-0402-431.30-79 (Crushed Stone) into account # 114-0405-431-40-18 (Road Machinery) for additional cost of equipment repairs; and

Please transfer **$1,500** from account # 114-0402-431.30-79 (Crushed Stone) into account #114-0407-431.50-27 (Architect and Engineer Fees) for cost of land surveying; and

Please transfer **$1,500** from account # # 114-0402-431.30-79 (Crushed Stone) into account #114-0407-431.50-62 (Travel Expense) for additional cost of travel.

Thank you.

EA/nr

AMENDED INTERLOCAL COOPERATION AGREEMENT
BETWEEN JEFFERSON COUNTY AND
PORT ARTHUR INDEPENDENT SCHOOL DISTRICT
(PRECINCT ~~8~~2 ASAP)

## 1. PARTIES

1.1 The Parties to this Amended Agreement are JEFFERSON COUNTY ("County"), a corporate and political body under the laws of the State of Texas, and the PORT ARTHUR INDEPENDENT SCHOOL DISTRICT ("District"), a Texas School district located in Jefferson County.

## 2. PURPOSE

2.1 The TEX. GOV'T CODE ANN. §791 et seq. (Vernon 1994 & Vernon Supp. 1998) authorizes contracts between counties and school districts for the performance of governmental functions and services. The District wants to have the Constable Precinct ~~8~~ 2 ("Officer") of Jefferson County, Texas, authorize and direct nine (9) Deputies (hereinafter called "A.S.A.P. deputies), to devote one hundred percent (100%) of their, "working time" per week, to the Absent Student Assistance Project (A.S.A.P.) for the District.

2.2 The District pursuant to TEX. GOV'T CODE ANN, §791.001 et seq. (Vernon 1994 & Vernon Supp. 1998), is willing to pay to Jefferson County fair compensation in an amount equal to one hundered per cent (100%) of the cost to the County- to supply the A.S.A.P. deputies, including salaries and any additional expenses the County may incur in providing the services, so as to enable the Officer to appoint deputies for such purpose.

## 3. TERM OF THE AGREEMENT

3.1 The term of this Agreement begins on ~~October~~ July 1, 201~~6~~7 and ends on September 30, 201~~7~~7, unless terminated sooner in accordance with section 7 of this Agreement.

## 4. COUNTY'S RIGHTS AND OBLIGATIONS

4.1 County agrees to authorize the Officer to appoint the above-designated number of A.S.A.P. deputies desired by the District, effective at the beginning of the term mentioned in Paragraph 3 of this agreement, so as to enable (but not require) the Officer to appoint said A.S.A.P. deputies to devote one hundred per cent (100%) of their working time to the A.S.A.P. The time that the A.S.A.P. deputies are on duty for the District, the time the A.S.A.P. deputies are in court in connection with cases arising out of events occurring under the A.S.A.P., the time the A.S.A.P. deputies spend preparing reports and documents pertaining to events occurring under the A.S.A.P., the time the A.S.A.P. deputies spend in making preparations to provide law enforcement for the District, the time the A.S.A.P. deputies spend transporting persons arrested in the District to jail or to the juvenile detention facilities, the time the A.S.A.P. deputies spend investigating crimes or possible crimes committed in the District, and one hundred per cent (100%) of the time the A.S.A.P. deputies are on vacation, one hundred per cent (100%) of the time the A.S.A.P. deputies are on sick leave, and one hundred per cent (100%) of the time the A.S.A.P. deputies receive worker's compensation benefits, if any, or any other paid leave, shall be deemed working time devoted to the District. The items listed above are explanatory and the meaning of "working time devoted to the District and under the A.S.A.P." is not limited to said list.

4.2 District expressly understands and agrees that the A.S.A.P. deputies (if such A.S.A.P. deputies are appointed by the Officer) shall be subject to the control and supervision of the Officer to the same extent as other deputies, and that such A.S.A.P. deputies shall have no duty or obligation to the District or the students, faculty, personnel, or other agents of the District other than those duties and obligations which the Officer's deputies have to the public generally.

4.3 It is also expressly understood and agreed that employment of the A.S.A.P. deputies (if such A.S.A.P. deputies are appointed by the Officer) will cease on the date this contract is terminated.

4.4 The County shall maintain payroll records for the ASAP officers, as a routine course of business. The County shall provide payroll records in electronic form to the District with each invoice forwarded to district for payment.

4.5 The County will provide notice to the school district of any expenses incurred– over the annual budgeted amount.

## 5. DISTRICT'S PAYMENT OBLIGATIONS

5.1 For the services provided, the District agrees to pay the County based on the compensation terms of the Articles of Agreement between Jefferson County, Texas and The Jefferson County Deputy Constables Association. The District– will pay one hundred per cent (100%) of the cost to the County for supplying the law enforcement services, including salaries, benefits, deferred liabilities, insurance, which also includes workers compensation costs, and any additional expenses the County may incur in providing the services of the A.S.A.P. deputies for the term of agreement.

5.2 In addition, the district also agrees to compensate County for hours worked in excess of 40, per deputy, per week at the rate of time and one half the officer's regular rate of pay.

5.3 District agrees to reimburse County for all supplies and equipment utilized by A.S.A.P. deputies.

5.4 District expressly understands and agrees that if payment is not received within thirty (30) days of the date due, this Agreement may be terminated by County without further notice. Further, failure of County to make demand for payment due shall not be a waiver of District's obligation to make timely payments.

5.5 District agrees to restrict as part of the district's fund balance the amount necessary to fund the deferred liabilities for sick leave, vacation accrual, compensatory time, and other post-employment benefits related to the A.S.A.P. deputies. This amount will be estimated by the County Auditor's office on an annual basis.

5.6. District agrees to reimburse the County for the purchase of liability automobile insurance to cover expenses and costs associated with the vehicles utilized by the A.S.A.P. officers. The District will be named as an additional insured. The District shall pay any deductible required in addition to damages incurred up to tort limits for accidents occurring while A.S.A.P. deputies are performing duties for PAISD.

## 6. COUNTY'S PREROGATIVE TO APPOINT DEPUTIES

6.1 District further understands and agrees that this Agreement is not intended (nor shall it be construed) to obligate the Officer in any manner whatsoever to assign the A.S.A.P. deputies to devote any portion of their working time to the District, and that County shall have no liability whatsoever to the District other than to refund the money paid by the District to County Pursuant to this Agreement, if the Officer does not assign the A. S. A. P. deputies to devote one hundred per cent (100%) of their working time to the A.S.A.P. Any and all questions as to whether or not the deputies devoted one hundred per cent (100%) of their working time to an area, if a refund is due, and the amount of the refund shall be determined by the Jefferson County Auditor and his determination shall be final and conclusive.

6.2 The District shall participate in an annual evaluation of ASAP officers to assess whether each officer has performed satisfactory services for the District.

6.3 If an ASAP officer is no longer agreeable to District because of performance or other employment related concerns on the part of District officials, then the Superintendent of District shall notify the Constable and give the Constable in writing the specific reason(s) for the concerns. The Constable will timely counsel with and attempt to have those issues properly addressed within seven days. If the ASAP officer's performance and other employment related concerns are not corrected to the satisfaction of District, Superintendent and Constable will meet to discuss and attempt to reach a consensus on the matter.

6.4 In the event any ASAP officer is terminated, the District shall be notified in writing, immediately. The County shall defend against payment of any unemployment benefits to any ASAP officers terminated for cause or who voluntary terminates his or her employment with the County.

## 7. TERMINATION AND DEFAULT

7.1 It is expressly understood and agreed that the period or term of this Agreement may be terminated without cause at any time by either party by giving to the other party at least thirty (30) days advance written notice of its intention to do so, specifying therein the effective date of such termination.

7.2 It is further expressly understood and agreed that the period or term of this Agreement may be terminated by County with or without notice at any time after District has defaulted in the payment of any obligation hereunder. It is understood and agreed if District shall at any time be in default hereunder, District shall be liable for expenses incurred by County as a result of such default, including, but not limited to attorney's fees and costs. Further, District shall be liable for interest at the rate of one percent (1%) for each month on all past due amount. The amount of expenses incurred and interest accrued, if any, shall be deemed to be in addition to any monies due for services rendered hereunder.

7.3 In the event a dispute arises between the County and District concerning any portion of payment due, the District agrees that only payment of the disputed amount may be retained by the District. The parties' further agree that they will put forth their best efforts toward successfully resolving any disputed amount in a timely and expeditious manner.

## 8. NOTICE

8.1 Any notice permitted or required to be given to Jefferson County hereunder may be given by registered or certified United States Mail, postage prepaid, return receipt requested, addressed to:

Jefferson County Commissioners Court
1149 Pearl Street
Beaumont, Texas 77701

Attention: Commissioners Court Clerk

Any notice permitted or required to be given hereunder to the District hereunder may be given by registered or certified United States Mail, postage prepaid, return receipt requested, addressed to:

Port Arthur I.S.D.
4801 9th Avenue
Port Arthur, Texas 77642

Such notice shall be deemed given and complete upon deposit of the notice in the United States Mail as aforesaid.

## 9. MISCELLANEOUS

9.1 The terms and provisions of this agreement constitute the entire agreement between the County and the District, and no modification of this agreement shall be effective unless in writing and executed by the authorized representative of both parties.

9.2 Upon request by the District, the County Auditor will conduct a payroll review of this Agreement and submit the results to the District within a reasonable time.

9.3 It is understood and agreed that the Office of Constable ~~Eddie Collins~~ Christopher L. Bates is an independent contractor and neither it nor any employees agents, or assignees contracted by it, shall be deemed for any purposes to be employees or agents of the District. The Constable's Office assumes full responsibility for the actions of such personnel and volunteers while performing any services incident to this Agreement and shall remain solely responsible for their supervision, daily direction and control, payment of salary (including withholding of income taxes and social security), worker's compensation disability benefits, and like requirements and obligations.

9.4 To the extent that the Office of Constable Christopher L. Bates ~~Eddie Collins~~ will come into possession of student records, incidential to this Agreement, the Constable's office agrees to comply with all requirements of the Family Educational Rights and Privacy Act. In the event that the District is required to furnish information or records of the Office of Constable Eddie Collins pertaining to this program pursuant to the Open Records Act, the Constable's Office shall furnish such information and records to the District and the District shall have the right to release such information and records.

9.5 Neither the Office of Constable ~~Eddie Collins~~ Christopher L. Bates nor the Parties waive or relinquish any governmental immunities or defenses on behalf of themselves, their trustees, officers, employees, and agents as a result of its execution of the Agreement and performance of the functions or obligations described herein.

9.6 This Agreement is made in Texas and shall be construed, interpreted, and governed by the laws of such state. The parties consent to the jurisdiction and venue of the courts of Jefferson County, Texas, for any action under this Agreement.

9.7 This Agreement is executed in three (3) copies, each of which shall have full force and effect of the original Agreement, and each of which shall constitute but one in the same instrument.

9.8 The Officer will provide District with a monthly report of all A.S.A.P. deputies' activities. The A.S.A.P. deputies will attend all scheduled meetings between District officials and Precinct ~~8~~2. A.S.A.P. deputies will provide home visits to all students appearing on the absentee list. This Officer will make every effort to reach the desired attendance projections for all middle schools within the area of ~~Precinct 8~~ Port Arthur ISD boundaries.

SIGNED in triplicate originals this_____day of _____20167.

APPROVED AS TO FORM:

KATHLEEN M. KENNEDY JEFFERSON COUNTY
First Assistant District Attorney

By_____ By_____
Jeff R. Branick - County Judge

PORT ARTHUR INDEPENDENT
SCHOOL DISTRICT

By _____
~~Thomas Kinlaw~~Rev. Donald Frank, Board President

APPROVED AS TO FORM:

_____
Melody Chappell
Attorney for Port Arthur
Independent School District

APPROVED:

_____
Dr. Mark Porterie
Superintendent of Schools

# Resolution

STATE OF TEXAS § COMMISSIONERS COURT
§
COUNTY OF JEFFERSON § OF JEFFERSON COUNTY, TEXAS

BE IT REMEMBERED at a meeting of Commissioners Court of Jefferson County, Texas, held on the 26nd day of June, 2017, on a motion made by Everette Alfred, Commissioner of Precinct No. 4, and seconded by Michael Sinegal, Commissioner of Precinct No. 3, the following Resolution was adopted:

**WHEREAS,** ***Rebecca Jéan Reynolds***, has devoted 32 years of her life serving the people of Jefferson County with pride and professionalism; and

**WHEREAS,** ***Rebecca Jéan Reynolds,*** began her career with Jefferson County in May 1985 as an auditor with the County Auditor's office under the direction of Jerry Ware, she has worked in all aspects of the office including implementing the current computer accounting system, becoming a Certified Grant Writer, a Certified Grant Compliance Officer, a Grant Financial Reporter, and many other duties, and has been honored by several Women's Business Professional Groups, and

**WHEREAS,** ***Rebecca Jéan Reynolds***, received her Bachelor of Business Administration with Specialization in Accounting with Highest Honors in 1983 from Lamar University and was the first Black employee to work in the Jefferson County Auditor's Office, often the only Black accountant attending conferences and seminars for many years early in her career with Jefferson County , and is currently the longest tenured employee in the County Auditor's office, and had an accounting joke stating "I don't do time for anybody, so don't do anything illegal or immoral or I will rat you out", and was promoted to Accounting and Grants Manager in 1995 dedicating her talents and services to Jefferson County; and

**WHEREAS,** through hard work and commitment to excellence, ***Rebecca Jéan Reynolds,*** has earned the respect of her colleagues and the citizens of Jefferson County; and

**WHEREAS,** having made a significant contribution to the Jefferson County Auditor's Office, ***Rebecca Jéan Reynolds,*** is recognized for her unselfish devotion to the common good and welfare of the citizens of Jefferson County; and will always be missed by her friends and co-workers.

**NOW THEREFORE, BE IT RESOLVED** that the Jefferson County Commissioners Court does hereby honor and commend ***Rebecca Jéan Reynolds***, for her dedicated service as a valuable employee of Jefferson County and wishes her well in her retirement.

SIGNED this 26th day of June 2017.

**JUDGE JEFF R. BRANICK**
**County Judge**

**COMMISSIONER EDDIE ARNOLD**
**Precinct No. 1**

**COMMISSIONER MICHAEL S. SINEGAL**
**Precinct No. 3**

**COMMISSIONER BRENT A. WEAVER**
**Precinct No. 2**

**COMMISSIONER EVERETTE D. ALFRED**
**Precinct No. 4**

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| JURY FUND | | | |
| TRI-CITY COFFEE SERVICE | 429.75 | 435085 | |
| DAWN DONUTS | 91.00 | 435177 | |
| | | | 520.75** |
| ROAD & BRIDGE PCT.#1 | | | |
| SPIDLE & SPIDLE | 3,235.44 | 435018 | |
| LOUIS' YAZOO SALES & SERVICE, LLC | 256.80 | 435055 | |
| M&D SUPPLY | 154.35 | 435056 | |
| SANITARY SUPPLY, INC. | 282.00 | 435073 | |
| DEPARTMENT OF INFORMATION RESOURCES | .17 | 435094 | |
| ADVANCE AUTO PARTS | 128.27 | 435148 | |
| CINTAS CORPORATION | 53.18 | 435188 | |
| | | | 4,110.21** |
| ROAD & BRIDGE PCT.#2 | | | |
| SPIDLE & SPIDLE | 3,714.96 | 435018 | |
| CERTIFIED LABORATORIES | 495.30 | 435031 | |
| MID-COUNTY ALTERNATOR | 125.00 | 435059 | |
| MUNRO'S | 40.00 | 435061 | |
| PHILPOTT MOTORS, INC. | 71.55 | 435069 | |
| SETZER HARDWARE, INC. | 4.99 | 435074 | |
| DEPARTMENT OF INFORMATION RESOURCES | .04 | 435094 | |
| CENTERPOINT ENERGY RESOURCES CORP | 45.18 | 435117 | |
| TRACTOR SUPPLY CO | 119.99 | 435122 | |
| NEW WAVE WELDING TECHNOLOGY | 6.82 | 435127 | |
| MEMBER'S BUILDING MAINTENANCE LLC | 149.50 | 435156 | |
| GCR TIRES & SERVICE | 93.00 | 435162 | |
| FRED MILLER'S OUTDOOR EQUIPMENT LLC | 35.90 | 435168 | |
| GULF COAST | 71.51 | 435192 | |
| | | | 4,973.74** |
| ROAD & BRIDGE PCT. # 3 | | | |
| ABLE FASTENER, INC. | 958.38 | 435014 | |
| HILO / O'REILLY AUTO PARTS | 200.53 | 435015 | |
| CERTIFIED LABORATORIES | 537.08 | 435031 | |
| CITY OF PORT ARTHUR - WATER DEPT. | 29.76 | 435033 | |
| FARM & HOME SUPPLY | 45.56 | 435040 | |
| ENTERGY | 283.20 | 435045 | |
| MUNRO'S | 23.40 | 435061 | |
| NOACK LOCKSMITH | 168.34 | 435062 | |
| OIL CITY TRACTORS, INC. | 16.50 | 435065 | |
| STRATTON INC. | 87.95 | 435088 | |
| DEPARTMENT OF INFORMATION RESOURCES | .09 | 435094 | |
| BEAUMONT FREIGHTLINER STERLING | 175.19 | 435119 | |
| TRACTOR SUPPLY CO | 29.98 | 435122 | |
| SHOPPA'S FARM SUPPLY | 310.28 | 435163 | |
| FELIX AAA AUTO & TRUCK PARTS LLC | 106.40 | 435174 | |
| | | | 2,972.64** |
| ROAD & BRIDGE PCT.#4 | | | |
| COASTAL WELDING SUPPLY | 55.80 | 435037 | |
| CASH ADVANCE ACCOUNT | 440.00 | 435051 | |
| ON TIME TIRE | 52.00 | 435143 | |
| SAM'S CLUB DIRECT | 139.88 | 435146 | |
| ASCO | 1,278.61 | 435149 | |
| TRANSIT & LEVEL CLINIC LLC | 25.00 | 435182 | |
| | | | 1,991.29** |
| ENGINEERING FUND | | | |
| UNITED STATES POSTAL SERVICE | 4.27 | 435102 | |
| | | | 4.27** |
| PARKS & RECREATION | | | |
| A&B OUTDOOR EQUIPMENT | 166.10 | 435013 | |
| HILO / O'REILLY AUTO PARTS | 64.47 | 435015 | |
| LOUIS' YAZOO SALES & SERVICE, LLC | 187.60 | 435055 | |
| SPRINT WASTE SERVICES LP | 310.80 | 435160 | |
| BK INDUSTRIAL SOLUTIONS LLC | 88.28 | 435169 | |
| | | | 817.25** |
| GENERAL FUND | | | |
| TAX OFFICE | | | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| DEPARTMENT OF INFORMATION RESOURCES | .02 | 435094 | |
| UNITED STATES POSTAL SERVICE | 515.07 | 435102 | |
| | | | 515.09* |
| COUNTY HUMAN RESOURCES | | | |
| CARPENTER'S TIME CENTER INC. | 40.00 | 435030 | |
| MOORMAN & ASSOCIATES, INC. | 450.00 | 435060 | |
| PINNACLE EMPLOYEE TESTING | 120.00 | 435070 | |
| SOCIETY FOR HUMAN RESOURCE | 199.00 | 435077 | |
| CDW COMPUTER CENTERS, INC. | 1,141.73 | 435092 | |
| UNITED STATES POSTAL SERVICE | 9.84 | 435102 | |
| SOUTHEAST TEXAS OCCUPATIONAL MEDICI | 375.00 | 435185 | |
| | | | 2,335.57* |
| AUDITOR'S OFFICE | | | |
| UNITED STATES POSTAL SERVICE | 12.55 | 435102 | |
| | | | 12.55* |
| COUNTY CLERK | | | |
| FED EX | 12.42 | 435041 | |
| OFFICE DEPOT | 584.24 | 435064 | |
| TAC - TEXAS ASSN. OF COUNTIES | 250.00 | 435080 | |
| UNITED STATES POSTAL SERVICE | 299.89 | 435102 | |
| | | | 1,146.55* |
| COUNTY JUDGE | | | |
| UNITED STATES POSTAL SERVICE | 3.09 | 435102 | |
| J.T. HAYNES | 500.00 | 435121 | |
| JAN GIROUARD & ASSOCIATES LLC | 400.00 | 435184 | |
| OFFERMAN & KING LLP | 1,000.00 | 435193 | |
| | | | 1,903.09* |
| RISK MANAGEMENT | | | |
| UNITED STATES POSTAL SERVICE | 15.59 | 435102 | |
| | | | 15.59* |
| COUNTY TREASURER | | | |
| OFFICE DEPOT | 178.21 | 435064 | |
| UNITED STATES POSTAL SERVICE | 174.60 | 435102 | |
| | | | 352.81* |
| PRINTING DEPARTMENT | | | |
| OLMSTED-KIRK PAPER | 775.50 | 435066 | |
| | | | 775.50* |
| PURCHASING DEPARTMENT | | | |
| UNITED STATES POSTAL SERVICE | 50.19 | 435102 | |
| | | | 50.19* |
| GENERAL SERVICES | | | |
| CASH ADVANCE ACCOUNT | 120.00 | 435051 | |
| TIME WARNER COMMUNICATIONS | 606.90 | 435082 | |
| COLIN'S KITCHEN LLC | 93.24 | 435175 | |
| TFORCE FINAL MILE | 203.30 | 435194 | |
| | | | 1,023.44* |
| DATA PROCESSING | | | |
| GRAYBAR ELECTRIC COMPANY, INC. | 62.12 | 435044 | |
| CDW COMPUTER CENTERS, INC. | 584.34 | 435092 | |
| TODD L. FREDERICK | 262.69 | 435103 | |
| | | | 909.15* |
| VOTERS REGISTRATION DEPT | | | |
| UNITED STATES POSTAL SERVICE | 125.15 | 435102 | |
| | | | 125.15* |
| ELECTIONS DEPARTMENT | | | |
| ULINE SHIPPING SUPPLY SPECIALI | 303.83 | 435086 | |
| | | | 303.83* |
| DISTRICT ATTORNEY | | | |
| FED EX | 96.24 | 435041 | |
| CASH ADVANCE ACCOUNT | 288.90 | 435051 | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| OFFICE DEPOT | 763.72 | 435064 | |
| JAMES ARCENEAUX | 630.82 | 435099 | |
| UNITED STATES POSTAL SERVICE | 256.80 | 435102 | |
| THOMSON REUTERS-WEST | 215.68 | 435151 | |
| HIGGINBOTHAM INSURANCE AGENCY INC | 71.00 | 435167 | |
| O'CONNOR'S | 126.00 | 435180 | |
| BODE CELLMARK FORENSICS | 4,123.63 | 435195 | |
| | | | 6,572.79* |
| DISTRICT CLERK | | | |
| OFFICE DEPOT | 283.47 | 435064 | |
| UNITED STATES POSTAL SERVICE | 315.71 | 435102 | |
| | | | 599.18* |
| CRIMINAL DISTRICT COURT | | | |
| KEVIN S. LAINE | 1,600.00 | 435091 | |
| UNITED STATES POSTAL SERVICE | 29.25 | 435102 | |
| | | | 1,629.25* |
| 58TH DISTRICT COURT | | | |
| UNITED STATES POSTAL SERVICE | .40 | 435102 | |
| | | | .40* |
| 60TH DISTRICT COURT | | | |
| CLERK - SUPREME COURT OF TEXAS | 235.00 | 435079 | |
| | | | 235.00* |
| 172ND DISTRICT COURT | | | |
| AMERICAN JUDGES ASSOCIATION., INC. | 175.00 | 435020 | |
| | | | 175.00* |
| 252ND DISTRICT COURT | | | |
| UNITED STATES POSTAL SERVICE | 117.83 | 435102 | |
| ANITA U SEPEDA | 100.00 | 435133 | |
| | | | 217.83* |
| 279TH DISTRICT COURT | | | |
| UNITED STATES POSTAL SERVICE | 1.61 | 435102 | |
| | | | 1.61* |
| JUSTICE COURT-PCT 1 PL 1 | | | |
| OFFICE DEPOT | 290.85 | 435064 | |
| UNITED STATES POSTAL SERVICE | 13.37 | 435102 | |
| | | | 304.22* |
| JUSTICE COURT-PCT 1 PL 2 | | | |
| OFFICE DEPOT | 38.66 | 435064 | |
| | | | 38.66* |
| JUSTICE COURT-PCT 4 | | | |
| DEPARTMENT OF INFORMATION RESOURCES | .44 | 435094 | |
| | | | .44* |
| JUSTICE COURT-PCT 6 | | | |
| UNITED STATES POSTAL SERVICE | 40.65 | 435102 | |
| | | | 40.65* |
| JUSTICE COURT-PCT 7 | | | |
| DEPARTMENT OF INFORMATION RESOURCES | .13 | 435094 | |
| | | | .13* |
| JUSTICE OF PEACE PCT. 8 | | | |
| OFFICE DEPOT | 107.45 | 435064 | |
| | | | 107.45* |
| COUNTY COURT AT LAW NO.1 | | | |
| UNITED STATES POSTAL SERVICE | .92 | 435102 | |
| | | | .92* |
| COUNTY COURT AT LAW NO. 2 | | | |
| JOHN E MACEY | 250.00 | 435057 | |
| NATHAN REYNOLDS, JR. | 250.00 | 435071 | |
| CHARLES ROJAS | 500.00 | 435093 | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| UNITED STATES POSTAL SERVICE | 2.82 | 435102 | |
| JOEL WEBB VAZQUEZ | 300.00 | 435115 | |
| THE BYRD LAW FIRM PC | 250.00 | 435120 | |
| JONATHAN VERNON | 250.00 | 435181 | |
| SEAN NGUYEN | 250.00 | 435187 | |
| | | | 2,052.82* |
| COUNTY COURT AT LAW NO. 3 | | | |
| UNITED STATES POSTAL SERVICE | 7.14 | 435102 | |
| ASHLEY CEDILLO | 250.00 | 435186 | |
| | | | 257.14* |
| COURT MASTER | | | |
| UNITED STATES POSTAL SERVICE | .46 | 435102 | |
| | | | .46* |
| MEDIATION CENTER | | | |
| UNITED STATES POSTAL SERVICE | 6.45 | 435102 | |
| | | | 6.45* |
| SHERIFF'S DEPARTMENT | | | |
| CITY OF NEDERLAND | 38.74 | 435034 | |
| FED EX | 221.73 | 435041 | |
| MCNEILL INSURANCE AGENCY | 142.00 | 435058 | |
| MOORMAN & ASSOCIATES, INC. | 4,950.00 | 435060 | |
| OFFICE DEPOT | 1,022.62 | 435064 | |
| SHERIFF'S ASSOCIATION OF TEXAS | 300.00 | 435076 | |
| CDW COMPUTER CENTERS, INC. | 212.43 | 435092 | |
| DEPARTMENT OF INFORMATION RESOURCES | 534.31 | 435094 | |
| UNITED STATES POSTAL SERVICE | 1,084.07 | 435102 | |
| BEAUMONT OCCUPATIONAL SERVICE, INC. | 164.75 | 435104 | |
| FIVE STAR FEED | 267.68 | 435109 | |
| RITA HURT | 1,100.00 | 435140 | |
| GALLS LLC | 411.94 | 435170 | |
| 3L PRINTING COMPANY | 75.00 | 435183 | |
| | | | 10,525.27* |
| CRIME LABORATORY | | | |
| AIRGAS SOUTHWEST | 72.67 | 435126 | |
| DPS REPROGRAPHICS & DISTRIBUTION | 195.00 | 435145 | |
| | | | 267.67* |
| JAIL - NO. 2 | | | |
| CITY OF BEAUMONT - WATER DEPT. | 12,780.14 | 435032 | |
| COASTAL WELDING SUPPLY | 41.85 | 435037 | |
| JACK BROOKS REGIONAL AIRPORT | 1,946.12 | 435050 | |
| DEPARTMENT OF INFORMATION RESOURCES | 2.78 | 435094 | |
| TEXAS GAS SERVICE | 293.87 | 435108 | |
| WORLD FUEL SERVICES | 2,358.23 | 435132 | |
| KROPP HOLDINGS INC | 793.99 | 435155 | |
| ENTERPRISE RENT A CAR COMPANY | 105.55 | 435161 | |
| | | | 18,322.53* |
| JUVENILE PROBATION DEPT. | | | |
| UNITED STATES POSTAL SERVICE | 114.73 | 435102 | |
| | | | 114.73* |
| JUVENILE DETENTION HOME | | | |
| ALL STAR PLUMBING | 2,750.86 | 435023 | |
| CITY OF BEAUMONT - WATER DEPT. | 2,369.23 | 435032 | |
| CHARMTEX INC. | 1,241.80 | 435110 | |
| FLOWERS FOODS | 204.75 | 435112 | |
| BEN E KEITH FOODS | 2,682.16 | 435113 | |
| CENTERPOINT ENERGY RESOURCES CORP | 348.83 | 435117 | |
| TEXAS JUVENILE DETENTION ASSOC | 200.00 | 435123 | |
| ATTABOY TERMITE & PEST CONTROL | 80.00 | 435131 | |
| A1 FILTER SERVICE COMPANY | 183.79 | 435139 | |
| | | | 10,061.42* |
| CONSTABLE PCT 1 | | | |
| OFFICE DEPOT | 101.27 | 435064 | |
| UNITED STATES POSTAL SERVICE | 106.24 | 435102 | |
| | | | 207.51* |
| CONSTABLE-PCT 4 | | | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| GT DISTRIBUTORS, INC. | 381.30 | 435042 | |
| | | | 381.30* |
| CONSTABLE-PCT 6 | | | |
| KAY ELECTRONICS, INC. | 134.75 | 435052 | |
| UNITED STATES POSTAL SERVICE | 9.27 | 435102 | |
| | | | 144.02* |
| CONSTABLE PCT. 7 | | | |
| AT&T | 31.18 | 435078 | |
| DEPARTMENT OF INFORMATION RESOURCES | .03 | 435094 | |
| | | | 31.21* |
| CONSTABLE PCT. 8 | | | |
| 10-32 SUPPLY | 247.00 | 435089 | |
| | | | 247.00* |
| COUNTY MORGUE | | | |
| AIR COMFORT, INC. | 1,176.00 | 435016 | |
| | | | 1,176.00* |
| AGRICULTURE EXTENSION SVC | | | |
| M&D SUPPLY | 533.43 | 435056 | |
| OFFICE DEPOT | 132.91 | 435064 | |
| UNITED STATES POSTAL SERVICE | 39.49 | 435102 | |
| | | | 705.83* |
| HEALTH AND WELFARE NO. 1 | | | |
| AMERICAN PUBLIC HEALTH ASSOCIATION | 110.00 | 435024 | |
| CITY OF BEAUMONT | 40.00 | 435025 | |
| BROUSSARD'S MORTUARY | 1,500.00 | 435028 | |
| CALVARY MORTUARY | 1,500.00 | 435029 | |
| CLAYBAR FUNERAL HOME, INC. | 4,497.00 | 435035 | |
| COMMUNITY FUNERAL CHAPEL, INC. | 1,170.00 | 435039 | |
| ENTERGY | 70.00 | 435046 | |
| PETTY CASH - N C WELFARE | 165.00 | 435067 | |
| PETTY CASH - N C WELFARE | 20.68 | 435068 | |
| UNITED STATES POSTAL SERVICE | 66.89 | 435102 | |
| | | | 9,139.57* |
| HEALTH AND WELFARE NO. 2 | | | |
| AMERICAN PUBLIC HEALTH ASSOCIATION | 110.00 | 435024 | |
| CLAYBAR FUNERAL HOME, INC. | 999.00 | 435036 | |
| GABRIEL FUNERAL HOME, INC. | 1,500.00 | 435043 | |
| LEVINGSTON FUNERAL HOME | 1,500.00 | 435054 | |
| TIME WARNER COMMUNICATIONS | 115.61 | 435083 | |
| EQUIFAX WORKFORCE SOLUTIONS | 67.25 | 435191 | |
| | | | 4,291.86* |
| CHILD WELFARE UNIT | | | |
| BEAUMONT OCCUPATIONAL SERVICE, INC. | 328.60 | 435104 | |
| J.C. PENNEY'S | 1,479.11 | 435105 | |
| SEARS COMMERICAL CREDIT | 138.95 | 435106 | |
| | | | 1,946.66* |
| ENVIRONMENTAL CONTROL | | | |
| AT&T | 61.92 | 435078 | |
| DEPARTMENT OF INFORMATION RESOURCES | .32 | 435094 | |
| | | | 62.24* |
| INDIGENT MEDICAL SERVICES | | | |
| KING'S PHARMACY | 125.08 | 435021 | |
| KING'S PHARMACY BEAUMONT | 22.67 | 435141 | |
| CARDINAL HEALTH 110 INC | 47,288.65 | 435154 | |
| DANA JOHNSON | 2,400.00 | 435165 | |
| | | | 49,836.40* |
| MAINTENANCE-BEAUMONT | | | |
| JOHNSTONE SUPPLY | 39.25 | 435019 | |
| CITY OF BEAUMONT - WATER DEPT. | 142.40 | 435032 | |
| COBURN'S, BEAUMONT BOWIE (1) | 108.33 | 435038 | |
| HYDRO-CLEAN SERVICES, INC. | 435.00 | 435047 | |
| M&D SUPPLY | 101.18 | 435056 | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| RALPH'S INDUSTRIAL ELECTRONICS | 186.45 | 435072 | |
| SANITARY SUPPLY, INC. | 306.68 | 435073 | |
| ACE IMAGEWEAR | 159.30 | 435075 | |
| AT&T | 157.04 | 435078 | |
| DEPARTMENT OF INFORMATION RESOURCES | 698.88 | 435094 | |
| BAKER DISTRIBUTING COMPANY | 731.25 | 435111 | |
| A1 FILTER SERVICE COMPANY | 732.70 | 435139 | |
| CARRIER ENTERPRISE LLC | 222.54 | 435152 | |
| | | | 4,021.00* |
| MAINTENANCE-PORT ARTHUR | | | |
| DEPARTMENT OF INFORMATION RESOURCES | .09 | 435094 | |
| FRED MILLER'S OUTDOOR EQUIPMENT LLC | 69.90 | 435168 | |
| | | | 69.99* |
| MAINTENANCE-MID COUNTY | | | |
| ACE IMAGEWEAR | 30.76 | 435075 | |
| CENTERPOINT ENERGY RESOURCES CORP | 80.56 | 435117 | |
| MEMBER'S BUILDING MAINTENANCE LLC | 1,925.52 | 435156 | |
| | | | 2,036.84* |
| SERVICE CENTER | | | |
| ACTION AUTO GLASS | 848.38 | 435017 | |
| SPIDLE & SPIDLE | 14,428.14 | 435018 | |
| J.K. CHEVROLET CO. | 112.14 | 435048 | |
| M&D SUPPLY | 38.25 | 435056 | |
| MUNRO'S | 39.70 | 435061 | |
| PHILPOTT MOTORS, INC. | 485.94 | 435069 | |
| SANITARY SUPPLY, INC. | 79.66 | 435073 | |
| S.E. TEXAS AUTO EQUIPMENT | 904.40 | 435090 | |
| JEFFERSON CTY. TAX OFFICE | 7.50 | 435095 | |
| JEFFERSON CTY. TAX OFFICE | 7.50 | 435096 | |
| JEFFERSON CTY. TAX OFFICE | 7.50 | 435097 | |
| PETROLEUM SOLUTIONS, INC. | 32.78 | 435114 | |
| BUMPER TO BUMPER | 661.69 | 435116 | |
| AMERICAN TIRE DISTRIBUTORS | 433.44 | 435128 | |
| MIGHTY OF SOUTHEAST TEXAS | 92.66 | 435137 | |
| CHASE ELECTRONICS | 130.00 | 435138 | |
| SILSBEE FORD INC | 609.30 | 435158 | |
| SOUTHEAST TEXAS PARTS AND EQUIPMENT | 381.48 | 435159 | |
| 1800RADIATOR & AC | 585.00 | 435166 | |
| CINTAS CORPORATION | 170.08 | 435188 | |
| DENNIS LOWE | 41.67 | 435189 | |
| MIDNIGHT AUTO | 79.95 | 435190 | |
| | | | 20,177.16* |
| VETERANS SERVICE | | | |
| UNITED STATES POSTAL SERVICE | 10.10 | 435102 | |
| HILARY GUEST | 98.33 | 435107 | |
| | | | 108.43* |
| | | | 155,583.55** |
| MOSQUITO CONTROL FUND | | | |
| SUPERIOR TIRE & SERVICE | 25.64 | 435022 | |
| JACK BROOKS REGIONAL AIRPORT | 928.49 | 435050 | |
| MUNRO'S | 82.20 | 435061 | |
| UNITED PARCEL SERVICE | 22.58 | 435087 | |
| DEPARTMENT OF INFORMATION RESOURCES | .08 | 435094 | |
| CENTERPOINT ENERGY RESOURCES CORP | 34.63 | 435117 | |
| LJA ENGINEERING INC | 906.25 | 435144 | |
| SOUTHEAST TEXAS PARTS AND EQUIPMENT | .00 | 435159 | |
| | | | 1,999.87** |
| J.C. FAMILY TREATMENT | | | |
| BEAUMONT OCCUPATIONAL SERVICE, INC. | 289.75 | 435104 | |
| PATRICIA VELASCO | 980.00 | 435178 | |
| | | | 1,269.75** |
| LAW LIBRARY FUND | | | |
| THOMSON REUTERS-WEST | 3,050.70 | 435150 | |
| | | | 3,050.70** |
| EMPG GRANT | | | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| TIME WARNER COMMUNICATIONS | 85.43 | 435084 | |
| | | | 85.43** |
| GRANT A STATE AID | | | |
| CASH ADVANCE ACCOUNT | 173.65 | 435051 | |
| YOUTH ADVOCATE PROGRAM | 5,754.56 | 435125 | |
| | | | 5,928.21** |
| 279 JUVENILE DRUG COURT | | | |
| IEA - INSPIRE, ENCOURAGE, ACHIEVE | 5,808.49 | 435100 | |
| | | | 5,808.49** |
| COMMUNITY SUPERVISION FND | | | |
| KIRKSEY'S SPRINT PRINTING | 24.95 | 435053 | |
| OFFICE DEPOT | 37.19 | 435064 | |
| OLMSTED-KIRK PAPER | 293.50 | 435066 | |
| DEPARTMENT OF INFORMATION RESOURCES | 1.65 | 435094 | |
| UNITED STATES POSTAL SERVICE | 69.84 | 435102 | |
| REDWOOD TOXICOLOGY LABORATORY | 228.50 | 435124 | |
| JCCSC | 259.00 | 435135 | |
| KALEIGH ABSHIRE | 56.18 | 435171 | |
| TEXAS A&M UNIVERSITY - COMMERCE | 425.00 | 435172 | |
| | | | 1,395.81** |
| JEFF. CO. WOMEN'S CENTER | | | |
| BELL'S LAUNDRY | 1,294.56 | 435027 | |
| AT&T | 133.70 | 435078 | |
| DEPARTMENT OF INFORMATION RESOURCES | .25 | 435094 | |
| CINTAS CORPORATION | 33.96 | 435188 | |
| | | | 1,462.47** |
| COMMUNITY CORRECTIONS PRG | | | |
| TEXAS A&M UNIVERSITY - COMMERCE | 100.00 | 435173 | |
| | | | 100.00** |
| BODY-WORN CAMERA GRANT | | | |
| COBAN TECHNOLOGIES INC | 60,150.00 | 435136 | |
| | | | 60,150.00** |
| COUNTY RECORDS MANAGEMENT | | | |
| OFFICE DEPOT | 68.96 | 435064 | |
| PCM-G | 1,990.00 | 435130 | |
| | | | 2,058.96** |
| DARE CONTRIBUTIONS FUND | | | |
| WOLFE'S TROPHY SHOP | 24.00 | 435164 | |
| | | | 24.00** |
| HOTEL OCCUPANCY TAX FUND | | | |
| D&S SIGN & SUPPLY, INC. | 186.00 | 435026 | |
| ENTERGY | 1,169.84 | 435045 | |
| MUNRO'S | 113.95 | 435061 | |
| TIME WARNER COMMUNICATIONS | 110.53 | 435081 | |
| TRI-CITY COFFEE SERVICE | 135.65 | 435085 | |
| DEPARTMENT OF INFORMATION RESOURCES | 8.04 | 435094 | |
| SAM'S CLUB DIRECT | 378.24 | 435146 | |
| HOOPLA ADVERTISING | 562.00 | 435179 | |
| | | | 2,664.25** |
| 1957 ROAD BOND FUND | | | |
| TIM RICHARDSON | 10,500.00 | 435157 | |
| | | | 10,500.00** |
| CAPITAL PROJECTS FUND | | | |
| LJA ENGINEERING INC | 653.12 | 435144 | |
| | | | 653.12** |
| AIRPORT FUND | | | |
| DEPARTMENT OF INFORMATION RESOURCES | .44 | 435094 | |
| UNITED STATES POSTAL SERVICE | 1.67 | 435102 | |
| CENTERPOINT ENERGY RESOURCES CORP | 106.78 | 435117 | |
| | | | 108.89** |
| AIRPORT IMPROVE. GRANTS | | | |

| NAME | AMOUNT | CHECK NO. | TOTAL |
|---|---|---|---|
| ALLCO, INC. | 410,200.88 | 435098 | |
| FAA | 49,892.77 | 435147 | |
| SE TX EMP. BENEFIT POOL | | | 460,093.65** |
| GROUP ADMINISTRATIVE CONCEPTS INC | 850.00 | 435134 | |
| LIABILITY CLAIMS ACCOUNT | | | 850.00** |
| CALVERT EAVES CLARKE & STELLY LLP | 10,440.73 | 435176 | |
| WORKER'S COMPENSATION FD | | | 10,440.73** |
| TRISTAR RISK MANAGEMENT | 4,066.35 | 435118 | |
| SHERIFF'S FORFEITURE FUND | | | 4,066.35** |
| SILSBEE FORD INC | 2,350.00 | 435158 | |
| JUVENILE DELINQUENCY PREV | | | 2,350.00** |
| PCM-G | 19,363.00 | 435130 | |
| MARINE DIVISION | | | 19,363.00** |
| JACK BROOKS REGIONAL AIRPORT | 408.03 | 435050 | |
| BUMPER TO BUMPER | 222.21 | 435116 | |
| C & I OIL COMPANY INC | 9,364.14 | 435129 | |
| EMERGENCY POWER SERVICE | 8,641.00 | 435142 | |
| | | | 18,635.38** |
| | | | 784,032.76*** |

**AGENDA ITEM** **June 26, 2017**

Receive and file executed Inter-local Agreement between Jefferson County, Texas and the South East Texas Regional Planning Commission allowing Jefferson County the use of the Swift reach 911 Emergency Alerting System.

SETRPC
SOUTH EAST TEXAS REGIONAL PLANNING COMMISSION

June 14, 2017

Fred L. Jackson
Attorney to County Judge
Associate Judge for Mental Hearings
Jefferson County, Texas
P.O. Box 4025
Beaumont, TX 77704

RE: Emergency Alerting Network System Interlocal Agreement

Dear Fred—

The fully executed interlocal agreement between Jefferson County and SETRPC is enclosed. You have my highest regard and gratitude for your assistance with the wording. Thank you!

Sincerely,

Sue

Sue Landry
Director
Criminal Justice and Homeland Security Division
South East Texas Regional Planning Commission

President – Eddie Arnold, Jefferson County | 1st VP – Chris Kirkendall, Hardin County | 2nd VP – Barry Burton, Orange County
3rd VP – Rebecca Ford, Bevil Oaks | Treasurer – Mary Adams, Kountze | Secretary – Kirk Roccaforte, Bridge City

Executive Director - Shaun P. Davis
2210 Eastex Freeway Beaumont, Texas 77703-4929
(409) 899-8444 | (409) 347-0138 fax
setrpc@setrpc.org | http://www.setrpc.org

**AGENDA ITEM** **June 12, 2017**

Consider, possibly approve and authorize the County Judge to execute an Inter-local Agreement between Jefferson County, Texas and the South East Regional Planning Commission allowing Jefferson County use of the Swift Reach 911 Emergency Alerting System.

**Emergency Notification System Interlocal Agreement**

This Agreement is entered into between the South East Texas Regional Planning Commission (SETRPC), and Jefferson County to participate in the regional Emergency Notification project utilizing Swift Reach 911.

**WHEREAS**, Jefferson County has established an emergency alerting system, and;

**WHEREAS**, SETRPC has contracted with Swift Reach 911 to provide cost effective Emergency Notification Services on behalf of participating local jurisdictions, and;

**WHEREAS**, the purpose of this system is to alert large numbers of citizens within a specific geographic area of important information for public safety purposes, and;

**WHEREAS**, in the event of a large-scale emergency or incident, the alerting system would benefit the citizens of Jefferson County by providing critical information in a timely fashion, and;

**WHEREAS**, Jefferson County has agreed to act as the single point of contact with West Intrado for access to the 9-1-1 Data Base for emergency alerting purposes, and;

**WHEREAS**, the South East Texas Regional Planning Commission 9-1-1 Emergency Network agrees to this arrangement regarding the use of the 9-1-1 Data Base for this purpose;

**NOW, THEREFORE, BE IT HEREBY RESOLVED:**

That SETRPC and Jefferson County hereby agree to the following terms of use of the Swift Reach 911 Emergency Alerting System and the 9-1-1 Data Base. Jefferson County has unlimited use of Swift Reach 911 at no cost to Jefferson County during the contract year. Unlimited non-emergency messages may be sent using the **non-9-1-1** data provided by Swift Reach 911. Jefferson County agrees to use the 9-1-1 West Intrado database only for the purpose of emergency notification purposes. Jefferson County understands that the data contained in the 9-1-1 Database is to be used for the purpose of warning or alerting citizens to an emergency situation as defined by the Federal Communications Commission (FCC) as a 'situation posing an extraordinary

threat to the safety of life and property" and that this data is to be maintained as confidential and not subject to public inspection in accordance with Texas Health and Safety Code, Section 771.062(a). In general, factors to be considered in determining whether an emergency situation is warranted are:

1. Severity—will aid in reducing loss of life or reducing substantial loss of property
2. Timing-requires immediate public knowledge to avoid adverse impacts
3. Other means of disseminating information are inadequate to ensure rapid delivery.

In order to maintain the confidential nature of the 9-1-1 data base information and the rights and privacy of citizens with unlisted and unpublished numbers, Jefferson County will be responsible for and agrees to create two separate account log-ins for the alerting system. One log-in will allow Jefferson County to use commercially available information for non-emergency messages. Jefferson County will determine who shall have access and under what conditions to this non-emergency messaging capability. Another, greatly restricted access log-in will be created by Jefferson County for the purpose of solely disseminating emergency alert messages as defined above and utilizing the 9-1-1 database information. The Emergency Management Coordinator for Jefferson County and/or his deputy or designee will be the only persons allowed access to the restricted emergency alert messaging log-in.

Due to the confidential nature of the 9-1-1 data base information and privacy of citizens with unlisted and unpublished numbers, SETRPC retains the right to withdraw their assistance if Jefferson County does not maintain the confidentiality of the information or for misuse of the emergency alerting system.

The SETRPC 9-1-1 Network will not be liable for any costs associated with the emergency alerting system including costs associated with the extract of data from the 9-1-1 data base. Associated costs for the unpublished West Intrado data will be covered by SETRPC Criminal Justice and Homeland Security Division through grant funds.

Charges for the activation and features specified in the Swift Reach 911 contract shall be the responsibility of the SETRPC Criminal Justice and Homeland Security Division (CJHSD) for a period not to exceed twelve months from the initiation date reflected in the contract between SETRPC CJHSD and Swift Reach 911 beginning October 1, 2017 and ending September 30, 2018. The contract/service agreement between SETRPC and Swift Reach 911 may be renewed indefinitely and this Interlocal Agreement between Jefferson County and SETRPC shall remain in full effect for the duration of the contract/service agreement with Swift Reach 911 unless SETRPC or Jefferson County cancels this Interlocal Agreement in in writing. SETRPC CJHSD will not be responsible for any costs other than the activation fee for the initial twelve-month period reflected in the contract between SETRPC CJHSD and Swift Reach 911 and any subsequent contract renewals. SETRPC CJHSD does not make any promise, guarantee or other obligation for continued activation of the Swift Reach 911 system beyond the initial twelve-month period. Continued activation of the emergency alerting system will be the sole responsibility of Jefferson County after the expiration of the initial twelve-month period unless additional funding is acquired for the regional project.

**INDEMNIFICATION BY Jefferson County, Texas:** Jefferson County agrees, only to the extent allowed by applicable law, to at all times indemnify, hold harmless and defend the SETRPC against any and all claims, causes of action, liabilities or losses, directly or indirectly arising as a result of Jefferson County's use of any Emergency Notification System services pursuant to the terms of this Agreement. Nothing herein will be deemed a waiver of governmental immunity other than per Texas Local Government Code Chapter 271.

This Agreement supersedes any and all other agreements, either oral or in writing between the parties hereto with respect to the subject matter hereof, and no other agreement, statement or promises relating to the subject matter of this Agreement which is not contained herein shall be valid or binding.

**IN WITNESS THEREOF**, the parties hereto have caused this Agreement to be executed as of the last date signed below.

6-13-17

Shaun P. Davis, Executive Director
South East Texas Regional Planning Commission

Date

6/12/17

The Honorable Jeff Branick
County Judge, Jefferson County

Date

# PROCLAMATION

| | | |
|---|---|---|
| STATE OF TEXAS | § | COMMISSIONERS COURT |
| | § | |
| COUNTY OF JEFFERSON | § | OF JEFFERSON COUNTY, TEXAS |

BE IT REMEMBERED at a meeting of Commissioners' Court of Jefferson County, Texas, held on the 26th day of June, 2017, on motion made by Brent Weaver, Commissioner of Precinct No. 2, and seconded by Eddie Arnold, Commissioner of Precinct No. 1, the following Proclamation was adopted:

## Port Neches-Groves Baseball Team 2017 5-A State Championship

**WHEREAS:** the Jefferson County Commissioners Court, are excited to recognize and honor the Port Neches-Groves Baseball team for capturing the 2017 5-A State Championship for the first time in school history when they defeated Grapevine, 4-2, and for the impressive record in 2017 as well as numerous and consecutive years in the playoffs; and

**WHEREAS:** this talented team and Coaches holds a District Record 14-0, Overall Record 34-8-2, Third district championship in a row, this season saw many 1st and many accolades for team and players and Coach Scott Carter earned his 500 victory this season defeating Lumberton. The team supported by student fans, coaches, parents, and supporters have all come together in making a truly championship team winning the 5-A State Championship for the first time ever; and

**WHEREAS**: the dedication, hard work, long hours of practice, mutual support and commitment of the team and coaches exemplify the pride and heart of the Port Neches Groves Baseball team and this tradition-rich support from their community and fans resulted in a great baseball program; and

**WHEREAS:** under the leadership of Coach Scott Carter and his coaching staff and other support staff with their astute and gifted coaching, the Indians were successful and many players were selected either Academic All District or All District and Coach of the Year for Scott Carter; and

**WHEREAS:** these student athletes have exhibited teamwork and dedication that transcends the baseball field; and

**WHEREAS**: the recognition and celebration of our PNG Baseball Team State Championship serves to bring our County together in honoring our the student athletes and their coaches for a remarkable baseball season resulting in an outstanding record and State Championship; and

**WHEREAS:** the coaching and dedication of the PNG baseball coaching staff should be honored for their commitment to the development of our youth through an amazing baseball program; and 1st Baseball State Championship in school history, 1st PNG state championship in 36 years, 1st boys state championship team in 42 years, 1st state tournament MVP; and

**NOW, THEREFORE BE IT PROCLAMIED**, by Jefferson County Commissioners Court, does hereby honor and recognize the PNG Indian Baseball team in Jefferson County for their success in being the 2017 5-A State Champions . The Jefferson County Commissioners Court calls on all our citizens to join with us in honoring and recognizing the PNG Indian Baseball team on their achievements.

Signed this 26th day of June, 2017.

**JUDGE JEFF R. BRANICK**
**County Judge**

**COMMISSIONER EDDIE ARNOLD**
**Precinct No. 1**

**COMMISSIONER MICHAEL S. SINEGAL**
**Precinct No. 3**

**COMMISSIONER BRENT A. WEAVER**
**Precinct No. 2**

**COMMISSIONER EVERETTE D. ALFRED**
**Precinct No. 4**

Port Neches Groves

| # | Name | Class |
|---|---|---|
| 1 | CARSON ROCCAFORTE | 9 |
| 2 | COURTLAND SULLIVAN | 12 |
| 3 | JACOB VAUGHAN | 12 |
| 4 | HAYDEN GUERRA | 12 |
| 5 | ZACH DECKERT | 11 |
| 6 | CAMERON STANSBURY | 11 |
| 7 | DYLAN MCGOUGH | 12 |
| 8 | LOGAN LEJEUNE | 12 |
| 9 | NATHAN VIDRINE | 12 |
| 10 | AUSTIN BOST | 11 |
| 12 | ALEC LEBOUEF | 11 |
| 13 | BRANDON PETIX | 11 |
| 14 | BRAXTON BOUDOIN | 12 |
| 15 | CAMRON ABATE | 11 |
| 16 | JAMISON SIMMONS | 10 |
| 17 | ZACH MURDOCK | 12 |
| 18 | TREVOR MARTIN | 12 |
| 20 | HUNTER CURTIS | 11 |
| 22 | AUSTIN SCHAPER | 10 |
| 23 | ZACH WHITE | 12 |
| 24 | HOLDEN LANE | 11 |
| 26 | BRANDON MORSE | 12 |
| 30 | JOSH HRANICKY | 11 |
| Stats | DALTON DRODDY | 12 |

Head Coach: Scott Carter
Assistant Coaches: Norm Abshere, Chris Mckeller, Kane Segura
Trainers: Rico Serna and Crystal Oden
Superintendent: Rodney Cavness
Principal: Scott Ryan
Athletic Director: Brandon Faircloth

Season Record: 30-8
District Record 14-0

District 22-5A Champions

**AGENDA ITEM** **June 26, 2017**

Consider, possibly approve, receive and file Annual Audit Report for Jefferson County Emergency Services District #4 pursuant to Section 775.082, Texas Health & Safety Code.

**BENCKENSTEIN & OXFORD, L.L.P.**

ATTORNEYS AT LAW
3535 CALDER AVENUE, SUITE 300
BEAUMONT, TEXAS 77706
PHONE: (409) 833-9182
FAX: (409) 833-8819

Joshua C. Heinz

jheinz@benoxford.com

June 20, 2017

***Via Hand Delivery***
Jefferson County Commissioners Court
c/o Hon. Jeff Branick, County Judge
Jefferson County Courthouse
1001 Pearl St.
Beaumont, Texas 77701

Re: Jefferson Co. ESD No. 4 – Fiscal Year 2015-16 Audit Report
B&O File No. 87102.

Dear Judge Branick and County Commissioners,

Enclosed please find Jefferson County Emergency Services District No. 4's annual audit report for the fiscal year ended September 30, 2016, which is being submitted to the Jefferson County Commissioners Court in accordance with Section 775.082 of the Texas Health & Safety Code.

Sincerely,

**BENCKENSTEIN & OXFORD, L.L.P.**

By: _____
Joshua C. Heinz

JCH/jcr
Enclosure

cc: ***Via Email***
Hon. Jeff Branick, County Judge
Mr. Fred Jackson
Board of Commissioners, JCESD No. 4

# JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4

## ANNUAL FINANCIAL REPORT
FOR THE YEAR ENDED SEPTEMBER 30, 2016

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT No. 4

CERTIFICATE OF BOARD

We, the undersigned, certify that this accompanying audit report of the above named district was reviewed and approved for the year ended September 30, 2016 at a meeting of the Board of Commissioners held on the 19th day of June, 2017.

Board ~~President~~ Vice President

Board ~~Secretary~~

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4
Annual Financial Report
For The Year Ended SEPTEMBER 30, 2016

TABLE OF CONTENTS

# *INTRODUCTORY SECTION*

# JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT No. 4

## JEFFERSON COUNTY, TEXAS

## FOR THE YEAR ENDED SEPTEMBER 30, 2016

**Board of Commissioners**

| | |
|---|---|
| Jeffery Roebuck | President |
| Charles Reneau | Vice President |
| Randy Walston | Secretary |
| Sandra Melton | Treasurer |
| Robert Bordes | Assistant Treasurer |

# *FINANCIAL SECTION*

J. R. Edwards & Associates, LLC
Certified Public Accountants

May 31, 2017

## INDEPENDENT AUDITOR'S REPORT

The Board of Commissioners
Jefferson County Emergency Services District No. 4
Jefferson County, Texas

We have audited the accompanying financial statements of the governmental activities, and each major fund of Jefferson County Emergency Services District No.4, as of and for the year ended September 30, 2016, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

### Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### Auditor's Responsibility

Our responsibility is to express opinions on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

### Opinions

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities, and each major fund the Jefferson County Emergency Services District No. 4, as of September 30, 2016, and the respective changes in financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.



4347 Crow Road • Beaumont, TX 77706
Phone (409) 924-9100 • Fax (409) 924-0990

**Other Matters**

*Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and budgetary comparison information on pages 4 - 9 and page 24 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

*J.R. Edwards & Associates, LLC*

In this section of the Annual Financial Report, we, the managers of the Jefferson County Emergency Services District No. 4 (the District), discuss and analyze the District's financial performance for the fiscal year ended September 30, 2016. We encourage readers to consider the information presented here in conjunction with the independent auditors' report on page 2, and the District's Basic Financial Statements that begin on page 10.

## FINANCIAL HIGHLIGHTS

- After the third year of operations, the District's total combined net position was $924,256 at September 30, 2016, as compared to $686,520 at September 30, 2015.
- During the year, the District's expenses were $237,736 less than the $595,227 generated in taxes and other revenues for governmental activities.
- The general fund reported a fund balance this year of $493,695. All is for unrestricted use by the District. The prior year fund balance was $373,428 at year end.

## OVERVIEW OF THE FINANCIAL STATEMENTS

This discussion and analysis are intended to serve as an introduction to the District's basic financial statements. The District's basic financial statements include three components: (1) management's discussion and analysis (this section), (2) the basic financial statements, and (3) required supplementary information.

**Government-Wide Financial Statements.** The *government-wide financial statements* are designed to provide readers with a broad overview of the District's finances, in a manner similar to a private-sector business. They include the Statement of Net Position and the Statement of Activities that provide information about the activities of the District as a whole and present a longer-term view of the District's property and debt obligations and other financial matters. They reflect the flow of total economic resources in a manner similar to the financial reports of a business enterprise.

The Statement of Net Position presents information in a format that displays assets, plus deferred outflows of resources, less liabilities, less deferred inflows of resources to equal net position. Net position is displayed in three components – net investment in capital assets, restricted, and unrestricted. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the District is improving or deteriorating. To assess the overall health of the District, one needs to consider additional nonfinancial factors such as changes in the District's tax base.

The *Statement of Activities* presents information showing how the government's net position changed during the current fiscal year. All changes in net position are reported for all of the current year's revenues and expenses regardless of when cash is received or paid. Thus, revenue and expenses are reported in this statement for some items that will only result in cash flows in future fiscal periods.

Both of the District's government-wide financial statements distinguish the functions of the District as being principally supported by taxes (governmental activities) as opposed to business-type activities that are intended to recover all or a significant portion of their costs through user fees and charges.

**OVERVIEW OF THE FINANCIAL STATEMENTS - Continued**

**Fund Financial Statements.** A *fund* is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objects. The District, like other state and local governments, uses fund accounting to ensure and demonstrate compliance with finance-related requirements. The fund financial statements provide detailed information about the District's most significant funds, *not* the District as a whole.

- Some funds are required by State law and by bond covenants.
- The Board of Commissioners may establish other funds to control and manage money for particular purposes or to show that it is properly using certain taxes and grants.

The District has the following kinds of funds:

- ***Governmental Funds.*** Governmental funds are used to account for essentially the same functions reported as governmental activities in the government-wide financial statements. However, unlike the government-wide financial statements, governmental fund financial statements focus on near-term inflows and outflows of spendable resources, as well as on balances of spendable resources available at the end of the fiscal year. Such information may be useful in evaluating a government's near-term financing requirements.

  Because the focus of governmental funds is narrower than that of the government-wide financial statements, it is useful to compare the information presented for governmental funds with similar information presented for governmental activities in the government-wide financial statements. By doing so, readers may better understand the long-term impact of the government's near-term financing decisions. Both the governmental funds balance sheet and the governmental funds statement of revenues, expenditures, and changes in fund balances provide a reconciliation to facilitate this comparison between governmental funds and governmental activities.

  The District's major governmental fund is the General Fund. Data for the remaining governmental funds are combined into a single, aggregated presentation.

  The District adopts an annual appropriated budget for its General Fund. A budgetary comparison statement has been provided for the General Fund to demonstrate compliance with this budget.

**Notes to the Financial Statements.** The notes provide additional information that is essential to a complete understanding of the data provided in the government-wide and fund financial statements. The notes to the financial statements can be found on pages 16-23 of this report.

**Required Supplementary Information.** In addition to the basic financial statements and accompanying notes, this report also presents certain *required supplementary information* that further explains and supports the information in the financial statements. Required supplementary information can be found on page 24 of this report.

## GOVERNMENT-WIDE FINANCIAL ANALYSIS

Our analysis focuses on the Net Position (Table I) and Changes in Net Position (Table II) of the District's governmental activities.

The District's combined net position was $924,256 at September 30, 2016. (See Table I)

**Table I**
**JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT No. 4**
**Net Position**

| | September 30, 2016 | September 30, 2015 |
|---|---|---|
| Current and Other Assets | $ 576,173 | $ 396,444 |
| Capital Assets | 705,066 | 485,011 |
| Total Assets | 1,281,239 | 881,455 |
| Long-term Liabilities | 305,596 | 189,516 |
| Other Liabilities | 51,387 | 5,419 |
| Total Liabilities | 356,983 | 194,935 |
| Net Assets: | | |
| Invested in Capital Assets Net of Related Debt | 399,470 | 295,495 |
| Unrestricted | 524,786 | 391,025 |
| Total Net Position | $ 924,256 | $ 686,520 |

A portion of the District's net position, $399,470, reflects its investment in capital assets net of related debt. The District uses these capital assets to provide services to citizens; therefore, these assets are not available for future spending. The $524,786 of unrestricted net position represents resources available to fund the programs of the District next year.

**Changes in net position.** The District's total revenues were $595,227. For the current year most of the revenues resulted from property taxes levied and miscellaneous revenues accounted for less than one percent.

In future years most of the District's revenues will be derived from property taxes.

Total Cost of all programs and services was $357,491. The net position of the District for the current year increased $237,736 (see Table II on page 7 of this report).

## GOVERNMENT-WIDE FINANCIAL ANALYSIS, Continued

Key elements of the governmental activities of the District are reflected in the following table.

**TABLE II**
**JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT No. 4**
**Changes in Net Position**

| | September 30, 2016 | September 30, 2015 |
|---|---|---|
| Revenues: | | |
| General Revenues: | | |
| Maintenance and Operations Taxes | 579,320 | 581,525 |
| Contribution | - | - |
| Miscellaneous | 15,907 | 3,777 |
| Total Revenue | 595,227 | 585,302 |
| Expenses: | | |
| General government | 185,706 | 80,494 |
| Fire and emergency services | 171,785 | 163,653 |
| Total Expenses Governmental Activities | 357,491 | 244,147 |
| Increase (Decrease) in Net Assets | 237,736 | 341,155 |
| Net Assets - October 1 (Beginning) | 686,520 | 345,365 |
| Net Assets - September 30 (Ending) | $ 924,256 | $ 686,520 |

## GOVERNMENTAL ACTIVITIES

- Property tax rates were set at $.08741 per $100 valuation for M&O. The rate for 2016-2017 is set at $.082274 per $100 of taxable valuation for M&O.

## FINANCIAL ANALYSIS OF THE DISTRICT'S FUNDS

As previously noted, the District uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements.

## GENERAL FUND BUDGETARY HIGHLIGHTS

There were few budget amendments for the 2015-2016 year and all were approved by the Commissioners.

## CAPITAL ASSET AND LONG-TERM DEBT ACTIVITY

**Capital Assets.** At September 30, 2016 the District had $705,066 (net of depreciation) invested in capital assets, buildings, equipment and vehicles.

**JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT No. 4**
**Capital Assets**
**Governmental Activities**

| | September 30, 2016 | September 30, 2015 |
|---|---|---|
| Buildings and Improvements | $ 19,510 | $ 13,910 |
| Emergency equipment and vehicles | 788,049 | 514,653 |
| Totals | 807,559 | 528,563 |
| | | |
| Less Accumulated Depreciation: | | |
| Buildings and Improvements | (1,281) | (734) |
| Emergency equipment and vehicles | (101,212) | (42,818) |
| Total Accumulated Depreciation | (102,493) | (43,552) |
| Net Capital Assets | $ 705,066 | $ 485,011 |

**Long-Term Debt.** At year-end, the District had $305,596 in notes payable outstanding. More detailed information about the District's long-term liabilities is presented in the notes to the financial statements.

**JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT No. 4**
**Outstanding Debt**

| | September 30, 2016 | September 30, 2015 |
|---|---|---|
| Governmental activities: | | |
| Note Payable | $ 305,596 | $ 189,516 |
| Total | $ 305,596 | $ 189,516 |

## ECONOMIC FACTORS AND NEW YEAR'S BUDGETS AND RATES

- The District's board adopted a balanced budget for the next fiscal year after giving consideration to the property tax assessed valuations and the level tax rate along with the needs of the District.

## CONTACTING THE DISTRICT'S FINANCIAL MANAGEMENT

This financial report is designed to provide our citizens, taxpayers, customers, and creditors with a general overview of the District's finances as well as demonstrate accountability for funds the District receives. Questions concerning any of the information provided in this report or requests for additional information should be addressed to the Jefferson County Emergency Services District No 4.

# *BASIC FINANCIAL STATEMENTS*

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JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 EXHIBIT A

STATEMENT OF NET POSITION

FOR THE YEAR ENDED SEPTEMBER 30, 2016

| | Primary Government Governmental Actitivies |
|---|---|
| ASSETS | |
| Cash and cash equivalents | $ 522,643 |
| Taxes receivable - net of allowance | 37,803 |
| Prepaids | 15,727 |
| Capital assets: | |
| Buildings, property, and equipment, net | 705,066 |
| Total Assets | 1,281,239 |
| LIABILITIES | |
| Accounts payable | 51,387 |
| Non-current liabilities: | |
| Due within one year | 65,874 |
| Due in more than one year | 239,722 |
| Total Liabilities | 356,983 |
| NET POSITION | |
| Net investment in capital assets | 399,470 |
| Unrestricted | 524,786 |
| Total Net Position | $ 924,256 |

The accompanying notes are an integral part of this financial statement.

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 EXHIBIT B

STATEMENT OF ACTIVITIES

FOR THE YEAR ENDED SEPTEMBER 30, 2016

| Functions / Programs | Expenses | Program Revenues: Charges for Services | Program Revenues: Operating Grants and Contributions | Net (Expense) Revenue and Changes in Net Position: Primary Government Governmental Activities |
|---|---|---|---|---|
| Governmental activities: | | | | |
| General government | $ 185,706 | $ - | $ - | $ (185,706) |
| Fire and emergency services | 171,785 | - | - | (171,785) |
| Total governmental activities | 357,491 | - | - | (357,491) |
| Total Primary Government | $ 357,491 | $ - | $ - | $ (357,491) |
| Property taxes, penalties and interest | | | | 579,320 |
| Contributions not restricted to specific programs | | | | |
| Other miscellaneous | | | | 15,907 |
| Total general revenues | | | | 595,227 |
| Change in Net Position | | | | 237,736 |
| Net Position- Beginning | | | | 686,520 |
| Net Position - Ending | | | | $ 924,256 |

The accompanying notes are an integral part of this financial statement.

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 — EXHIBIT C

BALANCE SHEET - GOVERNMENTAL FUNDS
FOR THE YEAR ENDED SEPTEMBER 30, 2016

| | Total Governmental Funds<br>General Fund |
|---|---|
| ASSETS: | |
| Cash and cash equivalents | $ 522,643 |
| Property taxes receivable (net of allowances for doubtful accounts) | 37,803 |
| Prepaid items | 15,727 |
| TOTAL ASSETS | $ 576,173 |
| LIABILITIES AND FUND BALANCES: | |
| LIABILITIES: | |
| Accounts payable | $ 51,387 |
| TOTAL LIABILITIES | 51,387 |
| DEFERRED INFLOWS OF RESOURCES: | |
| Unavailable revenue - property tax | 31,091 |
| TOTAL DEFERRED INFLOWS OF RESOURCES | 31,091 |
| FUND BALANCES: | |
| Unassigned Fund Balance | 493,695 |
| Total fund balances | 493,695 |
| TOTAL LIABILITIES DEFERRED INFLOWS AND FUND BALANCE | $ 576,173 |

The accompanying notes are an integral part of this financial statement.

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 EXHIBIT C-1

RECONCILIATION OF THE BALANCE SHEET OF GOVERNMENTAL FUNDS TO THE STATEMENT OF NET POSITION
SEPTEMBER 30, 2016

| | | |
|---|---|---|
| Governmental fund balance as reported on the balance sheet for governmental funds. | $ | 493,695 |
| Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds. | | 705,066 |
| Long-term liabilities, including bonds payable, are not due and payable in the current period and, therefore, are not reported in the funds. | | (305,596) |
| Recognition of deferred revenue as revenue increases net position. | | 31,091 |
| Total net position as reported on the Statement of Net Position for Governmental Activities. | $ | 924,256 |

The accompanying notes are an integral part of this financial statement.

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 EXBHIBIT D

STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES - GOVERNMENTAL FUNDS
FOR THE YEAR ENDED SEPTEMBER 30, 2016

| | Total Governmental Funds |
|---|---|
| | General Fund |
| REVENUES | |
| Property taxes, penalties and interest | $ 565,826 |
| Other miscellaneous | 15,907 |
| Total revenue | 581,733 |
| EXPENDITURES: | |
| Current: | |
| General government | 185,706 |
| Fire and emergency services | 391,840 |
| Total expenditures | 577,546 |
| EXCESS (DEFICIENCY) OF REVENUES OVER (UNDER) EXPENDITURES | 4,187 |
| OTHER FINANCING SOURCES (USES) | |
| Issuance of debt | 152,000 |
| Principal payments on loan | (35,920) |
| Total other financing sources and uses | 116,080 |
| NET CHANGE IN FUND BALANCES | 120,267 |
| FUND BALANCES - BEGINNING | 373,428 |
| FUND BALANCES - ENDING | $ 493,695 |

The accompanying notes are an integral part of this financial statement.

JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 EXHIBIT D-1

RECONCILIATION OF THE STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES OF GOVERNMENTAL FUNDS TO THE STATEMENT OF ACTIVITIES FOR THE YEAR ENDED SEPTEMBER 30, 2016

| | | |
|---|---|---|
| Net change in fund balances - total governmental funds (Exhibit D) | | $ 120,267 |
| Governmental funds report capital outlays as expenditures. However, in the statement of activities the cost of those assets is allocated over their estimated useful lives and reported as depreciation expense. This is the amount by which capital outlays exceeded depreciation in the current period. | | |
| Capital Outlay | $ 278,996 | |
| Depreciation | (58,941) | 220,055 |
| The issuance of long-term debt provides current financial resources to governmental funds, while the repayment of the principal of long-term debt consumes the current financial resources of governmental funds. Neither transaction, however, has any effect on net position. | | |
| Issuance of new debt | $ (152,000) | |
| Principal payments on loan | 35,920 | (116,080) |
| Because some revenues will not be collected for several months after the District's fiscal year end, they are not considered "available" revenue and are deferred in the governmental funds. Deferred revenues decreased by this amount in the current period. | | 13,494 |
| Change in net position of governmental activities (Exhibit B) | | $ 237,736 |

The accompanying notes are an integral part of this financial statement.

## NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### Basis of Presentation

The financial statements of the Jefferson County Emergency Services District No. 4 (the "District") have been prepared in conformity with generally accepted accounting principles (GAAP) as applied to governmental units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The following represents the significant accounting policies used by the District.

### A. Reporting Entity

On May 11, 2013, the voters of the District approved the formation of an emergency services district under Article III, Section 48-e of the Texas Constitution and Chapter 775 of the Health and Safety Code of the State of Texas. On May 11, 2013, the County Commissioners Court of Jefferson County, Texas approved the order to form the Jefferson County Emergency Services District No. 4. The District was formed on June 10, 2013 and operates under Board of Commissioners appointed by the Commissioners Court of Jefferson County. The District services the areas previously serviced by the Cheek Volunteer Fire Department and the Labelle-Fannett Volunteer Fire Department. The District is exempt from federal income taxes, state sales tax and state franchise tax.

### B. Government-wide Financial Statements

The government-wide financial statements (i.e., the Statement of Net Position and the Statement of Changes in Net Position) report information on all of the nonfiduciary activities of the primary government. *Governmental activities,* which normally are supported by taxes and intergovernmental revenues, are reported separately from *business-type activities*, which rely to a significant extent on fees and charges for support. Likewise, the *primary government* is reported separately from certain legally separate *component units* for which the primary government is financially accountable.

The District currently does not have any business-type activities or component units.

The statement of activities demonstrates the degree to which the direct expenses of a given structure or segment, are offset by program revenues. *Direct expenses* are those that are clearly identifiable with a specific function or segment. *Program revenues* include 1) charges to customers or applicants who purchase, use, or directly benefit from goods, services, or privileges provided by a given function or segment; and 2) grants and contributions that are restricted to meeting the operational or capital requirements of a particular function or segment. Taxes and other items not properly included among program revenues are reported instead as *general revenues.*

As a general rule, the effect of interfund activity has been eliminated from the government-wide financial statements.

### C. Fund Financial Statements

The fund financial statements provide information about the government's funds. The emphasis of fund financial statements is on major governmental funds. At this time the District only has one fund.

The District reports the following major governmental funds:

The *general fund* is the government's primary operating fund. It accounts for all financial resources of the general government, except those required to be accounted for in another fund.

## NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES, Continued

### D. Measurement Focus, Basis of Accounting and Financial Statement Presentation

The accounting and financial reporting treatment is determined by the applicable measurement focus and basis of accounting. Measurement focus indicates the type of resources being measured such as *current financial resources* or *economic resources*. The basis of accounting indicates the timing of transactions or events for recognition in the financial statements.

The government-wide financial statements are reported using the *economic resources measurement focus* and the *accrual basis of accounting*. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows. Property taxes are recognized as revenues in the year for which they are levied.

Governmental fund financial statements are reported using the current financial *resources measurement focus* and the *modified accrual basis of accounting*. Under the modified accrual basis of accounting, revenues are recognized when susceptible to accrual, i.e., both measurable and available to finance expenditures of the fiscal period. Revenues are considered available when they are collectible within the current period or soon enough thereafter to be pay liabilities of the current period. For this purpose, the government considers revenues available if they are collected within 60 days of the end of the current fiscal period. Expenditures generally are recorded when a liability is incurred, as under accrual accounting. However, debt service expenditures, as well as expenditures related to compensated absences, claims and judgments, are recorded only when the payment is due. General capital asset acquisitions are reported as expenditures in governmental funds. Issuance of long-term debt and acquisitions under capital leases are reported as other financing sources.

Property taxes, and interest associated with the current fiscal period are all considered to be susceptible to accrual and so have been recognized as revenues of the current fiscal period. All other revenue items are considered to be measurable and available only when cash is received by the District.

### E. Budgetary Data

The following procedures are utilized in establishing the budgetary data reflected in the basic financial statements:

a. The Fire Chief submits to the Commissioners a proposed operating budget for the fiscal year commencing the following October 1. The operating budget includes proposed expenditures and the means of financing them. The General Fund is the only Fund the District has at this time.

b. A Public hearing is conducted, after proper official journal notification, to obtain taxpayer comments.

c. Prior to September 30th, the budget is legally adopted.

d. Budget appropriations lapse at year-end and are re-established in the succeeding year.

e. Budgets for the governmental funds are adopted on a basis consistent with generally accepted accounting principles (GAAP).

## NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES, Continued

### F. Cash and Investments

Cash includes amounts in demand and time deposit accounts. Investments are reported at fair value. Short-term investments, such as certificates of deposit and debt securities with a maturity date of less than one year, are reported at cost, which approximates fair value.

### G. Property Taxes Receivable

Property appraisal within the District is the responsibility of the Jefferson County Appraisal District (Appraisal District). The Appraisal District is required under the Property Tax Code to appraise all property within the County on the basis of 100% of its market value.

In the governmental fund financial statements, property taxes that are measurable and available (receivable within the current period and collected within the current period or within 60 days thereafter to be used to pay liabilities of the current period) are recognized as revenue in the year of levy. Property taxes that are measurable, but not available, are recorded, net of estimated uncollectible amounts, as deferred revenues in the year of levy. Such deferred revenues are recognized as revenue in the fiscal year in which they become available.

### H. Receivables

All receivables are reported at their gross value and, where appropriate, are reduced by the estimated portion that is expected to be uncollectible.

### I. Prepaid Items

Certain payments to vendors reflect costs applicable to future accounting periods and are recorded as prepaid items.

### J. Capital Assets

Capital assets which include property, furniture, and equipment are reported in the applicable governmental or business-type activities columns in the government-wide financial statements. Capital assets are defined by the government as assets with an initial, individual cost of $5,000 or more and an estimated useful life in excess of one year. Such assets are recorded at historical cost or estimated historical cost if purchased or constructed. Donated capital assets are recorded at estimated fair market value at the date of donation. The costs of normal maintenance and repairs that do not add to the value of the asset or materially extend assets lives are not capitalized. When assets are retired or otherwise disposed of, the related costs or other recorded amounts are removed.

Property, plant and equipment of the District are depreciated using the straight-line method over the following estimated useful lives:

| Assets | Years |
|---|---|
| Buildings | 20-30 |
| Leasehold Improvements | 15-30 |
| Furniture and Equipment | 5-10 |
| Vehicles | 5-15 |

## NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES, Continued

### K. Long-term Obligations

In the government-wide financial statements, long-term debt and other long-term obligations are reported as liabilities in the applicable governmental activities. Bond premiums and discounts, as well as issuance costs, are deferred and amortized over the life of the bonds using the straight line method. Bonds payable are reported net of the applicable bond premium or discount.

Long-term debt for governmental funds is not reported as liabilities in the fund financial statements. The debt proceeds are reported as expenditures.

### L. Fund Equity

In the fund financial statements, governmental funds report classifications of fund balance based on controls placed upon the funds. In accordance with GASB Statement No. 54, fund balance classifications are recorded as follows:

Non-spendable Fund Balance – amounts that are not in spendable form or amounts that are legally and contractually required to be maintained intact.

Restricted Fund Balance – amounts constrained to a specific purpose by external parties through constitutional provisions or by enabling legislation.

Committed Fund Balance – amounts constrained to a specific purpose by the Commissioners (the highest level of authority within the District); amounts may only be appropriated by resolution of the Board of Commissioners and those amounts cannot be used for any other purpose unless the Commissioners take the same action to remove or change the constraint.

Assigned Fund Balance- the Board of Commissioners delegate authority to the District Fire Chief to assign amounts for specific purpose as appropriate.

Unassigned Fund balance – residual classification applicable to the general fund only.

The District's unassigned general fund balance will be maintained to provide the District with sufficient working capital and a margin of safety to address local and regional emergencies without borrowing. The unassigned general fund balance may only be appropriated by resolution of the Commissioners.

When it is appropriate for fund balance to be assigned, the Commissioners delegate authority to the District Fire Chief.

In circumstances where an expenditure is to be made for a purpose for which amounts are available in multiple fund balance classifications, the order in which resources will be expended is from the most restrictive to the least restrictive, unless otherwise approved by the Commissioners.

## NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES, Continued

### M. Implementation of New Standards

GASB Statement 63 Financial Reporting of Deferred Outflows of Resources, Deferred Inflows of Resources, and Net Position, amends the net asset reporting requirements in Statement No. 34 and other pronouncements by incorporating deferred outflows of the resources and deferred inflows of resources into the definitions of the required components of the residual measure and by renaming that measure as net position rather than net assets. This is reflected in the District's financial statements.

### N. Date of Management's Review

In preparing the financial statements, the District has evaluated events and transactions for potential recognition for disclosure through May 31, 2017, the date that the financial statements were available to be issued.

## NOTE 2: CASH AND INVESTMENTS

At year-end, the District's carrying amount of deposits was $522,643 and the bank balance was $524,605. At September 30, 2016, the bank balance was covered by federal depository insurance. Deposits are exposed to custodial risk if they are not covered by depository insurance and the deposits are uncollateralized, collateralized with securities held by the pledging financial institution, or collateralized with securities held by the pledging financial institution's trust department or agent but not in the District's name. The District's ending bank balance was $524,605 as of September 30, 2016. Of this amount, $250,000 was covered by FDIC insurance, $469,132 was covered by collateral held in the District's name, allowing the District to be collateralized in excess of $194,527.

## NOTE 3: PROPERTY TAXES

Property taxes are collected by Allison Getz, Jefferson County Tax Assessor Collector, and are forwarded to the District through bank transfer. The tax rate held by the District during 2016 was $.08741 per $100 of assessed valuation. Property tax revenues are considered available when they become due or past due and are considered receivable within the current period, including those property taxes expected to be collected during a 60 day period after the close of the District's fiscal year. Property taxes are levied on October 1 of each year, a lien is placed on the property on January 1, and the taxes become due on January 31. The taxable assessed value for the roll of December 31, 2015 was $683,334,585. Property taxes receivable for 2016 are $37,803 net of allowance for doubtful accounts of $13,664.

## NOTE 4: CAPITAL ASSETS

Capital asset activity for the governmental activities for the year ended September 30, 2016 was as follows:

| Governmental Activities | Beginning Balance | Current Year Increases | Current Year Decreases | Ending Balance |
|---|---|---|---|---|
| Capital assets being depreciated: | | | | |
| Buildings | $ 13,910 | $ 5,600 | $ - | $ 19,510 |
| Fire equipment and vehicles | 514,653 | 273,396 | - | 788,049 |
| Total capital assets being depreciated: | 528,563 | 278,996 | - | 807,559 |
| Less accumulated depreciation: | | | | |
| Buildings | (734) | (547) | - | (1,281) |
| Fire equipment and vehicles | (42,818) | (58,394) | - | (101,212) |
| Total accumulated depreciation | (43,552) | (58,941) | - | (102,493) |
| Total capital assets being depreciated, net | 485,011 | 220,055 | - | 705,066 |
| Governmental activities capital assets, net | $ 485,011 | $ 220,055 | $ - | $ 705,066 |

Depreciation expense of the governmental activities was charged to functions/programs as follows:

| | |
|---|---|
| Fire and Emergency Services | $ 58,941 |
| Total Depreciation Expense - Governmental Activities | $ 58,941 |

## NOTE 5: LONG TERM DEBT

The District entered into a loan agreement for the purchase of a vehicle for fire and emergency services.

Long-term debt at September 30, 2016, is summarized as follows:

| Date Issued | Amount | Final Maturity | Annual Installments | % Rate | Outstanding Balance |
|---|---|---|---|---|---|
| 2015 | $ 189,516 | 2020 | $41,011 | 2.686% | 153,596 |
| 2016 | 152,000 | 2021 | $32,604 | 2.379% | 152,000 |
| | | | | | $ 305,596 |

Interest on the loan shall be computed at a fixed rate of 2.686% and 2.379% respectively, for five years provided that such rate shall not exceed the highest lawful rate. This note may be prepaid in full according to the early redemption value on due date of the loan in years three and four as shown on the table below.

## NOTE 5: LONG TERM DEBT, Continued

Annual requirements to maturity for the loan is as follows:

| Year Ending September 30, | Principal | Interest | Total | Early Redemption Value |
|---|---|---|---|---|
| 2017 | 65,874 | 7,742 | 73,616 | N/A |
| 2018 | 67,553 | 6,061 | 73,614 | 79,568 |
| 2019 | 69,277 | 4,337 | 73,614 | 103,629 |
| 2020 | 71,045 | 2,571 | 73,616 | 32,011 |
| 2021 | 31,847 | 758 | 32,605 | N/A |
| Total | $ 305,596 | $ 21,469 | $ 327,065 | $ 215,208 |

Changes in long-term liabilities

Long-term liability activity for the year ended September 30, 2015, was as follows:

| | Beginning Balance | Additions | Reductions | Ending Balance | Due Within One Year |
|---|---|---|---|---|---|
| Governmental activities: | | | | | |
| Loans payable | 189,516 | 152,000 | 35,920 | 305,596 | 65,874 |
| Governmental activities Long-Term Liabilities | $ 189,516 | $ 152,000 | $ 35,920 | $ 305,596 | $ 65,874 |

## NOTE 6: OTHER INFORMATION

### A. Risk Management

The District continues to carry commercial insurance for the risks of loss. There were no significant reductions in commercial insurance coverage in the past fiscal year and settled claims resulting from these risks have not exceeded coverage during the year. Management believes the amount and types of coverage are adequate to protect the District from losses which could reasonably be expected to occur.

### B. Contingent Liabilities

Amounts received or receivable from grantor agencies are subject to audit and adjustment by grantor agencies, principally the federal government. Any disallowed claims, including amounts already collected, may constitute a liability of the applicable funds. The amount, if any, of expenditures which may be disallowed by the grantor cannot be determined at this time although the District expects such amounts, if any to be immaterial.

**NOTE 6: OTHER INFORMATION, Continued**

**C. Subsequent Events**

At the regularly scheduled February 2017 board meeting, the board approved the purchase of a two acre tract to be used for the future Fire / EMS station in the amount of $48,000.

# *REQUIRED SUPPLEMENTARY INFORMATION*

Required supplementary information includes financial information and disclosures required by the Governmental Accounting Standards Board but not considered a part of the basic financial statements.

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JEFFERSON COUNTY EMERGENCY SERVICES DISTRICT NO. 4 EXHIBIT E

STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE
BUDGET AND ACTUAL - GENERAL FUND
FOR THE YEAR ENDED SEPTEMBER 30, 2016

| | Budgeted Amounts | | Actual Amounts | Variance with Final Budget - Positive (Negative) |
|---|---|---|---|---|
| | Original | Final | | |
| REVENUES | | | | |
| Property taxes, penalties and interest | $ 597,302 | $ 590,900 | $ 565,826 | $ (25,074) |
| Other miscellaneous | 200 | 15,000 | 15,907 | 907 |
| Total revenue | 597,502 | 605,900 | 581,733 | (24,167) |
| EXPENDITURES | | | | |
| Current: | | | | |
| General government | 196,000 | 219,295 | 185,706 | 33,589 |
| Fire and emergency services | 342,000 | 416,606 | 391,840 | 24,766 |
| Total expenditures | 538,000 | 635,901 | 577,546 | 58,355 |
| EXCESS (DEFICIENCY) OF REVENUES OVER (UNDER) EXPENDITURES | 59,502 | (30,001) | 4,187 | 34,188 |
| OTHER FINANCING SOURCES (USES) | | | | |
| Proceeds from loan | - | 152,000 | 152,000 | - |
| Principal payments on loan | (41,012) | (35,921) | (35,920) | 1 |
| Total other financing sources and uses | (41,012) | 116,079 | 116,080 | 1 |
| NET CHANGE IN FUND BALANCES | 18,490 | 86,078 | 120,267 | 34,189 |
| FUND BALANCES AT BEGINNING OF YEAR | 373,428 | 373,428 | 373,428 | - |
| FUND BALANCE AT END OF YEAR | $ 391,918 | $ 459,506 | $ 493,695 | $ 34,189 |

The accompanying notes are an integral part of this financial statement.

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# *COMPLIANCE SECTION*

J. R. Edwards & Associates, LLC
Certified Public Accountants

May 31, 2017

***INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH GOVERNMENT AUDITING STANDARDS***

Board of Commissioners
Jefferson County Emergency Services District No. 4
Jefferson County, Texas

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the governmental activities, and each major fund of Jefferson County Emergency Services District No. 4 (District), as of and for the year ended September 30, 2016, and the related notes to the financial statements, which collectively comprise the District's basic financial statements, and have issued our report thereon dated May 31, 2017.

**Internal Control Over Financial Reporting**

In planning and performing our audit of the financial statements, we considered the District's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, we do not express an opinion on the effectiveness of the District's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or, significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

**Compliance and Other Matters**

As part of obtaining reasonable assurance about whether the Jefferson County Emergency Services District No. 4 financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.



4347 Crow Road • Beaumont, TX 77706
Phone (409) 924-9100 • Fax (409) 924-0990

Board of Commissioners
Jefferson County Emergency Services District No. 4
May 31, 2017

**Purpose of this Report**

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

*J.R. Edwards & Associates, LLC*

**AGENDA ITEM** **June 26, 2017**

Receive and file Annual Road Reports of Jefferson County Commissioners of Precincts 1, 2, 3, and 4 pursuant to Section 251.005, Texas Transportation Code and file a copy of same with the Grand Jury.

**COUNTY OF JEFFERSON** §
§
**PRECINCT NO. 1** §

## ANNUAL ROAD REPORT

1. Condition of each road, culvert, and bridge in the precinct and the primary cause of any road, culvert or bridge degradation: Primary damage due to overweight truck traffic.

2. Amount of money necessary for maintenance of the precinct roads during the next fiscal year: $1,056,286.00 approximate total for the administrative and maintenance of roads - see complete 2017 budget.

3. Number of traffic control devices in the precinct defaced or torn down: 52

4. Any new road that should be opened in the precinct: Pondarosa, Foxtail Trail, Loblolly Trail

5. Any bridges, culverts, or other improvements necessary to place the precinct roads in good condition, and the probable cost of the improvements: See 2017 R&B Pct. 1 budget

Submitted by the undersigned on this 13th day of June 2017.

Commissioner, Precinct ___

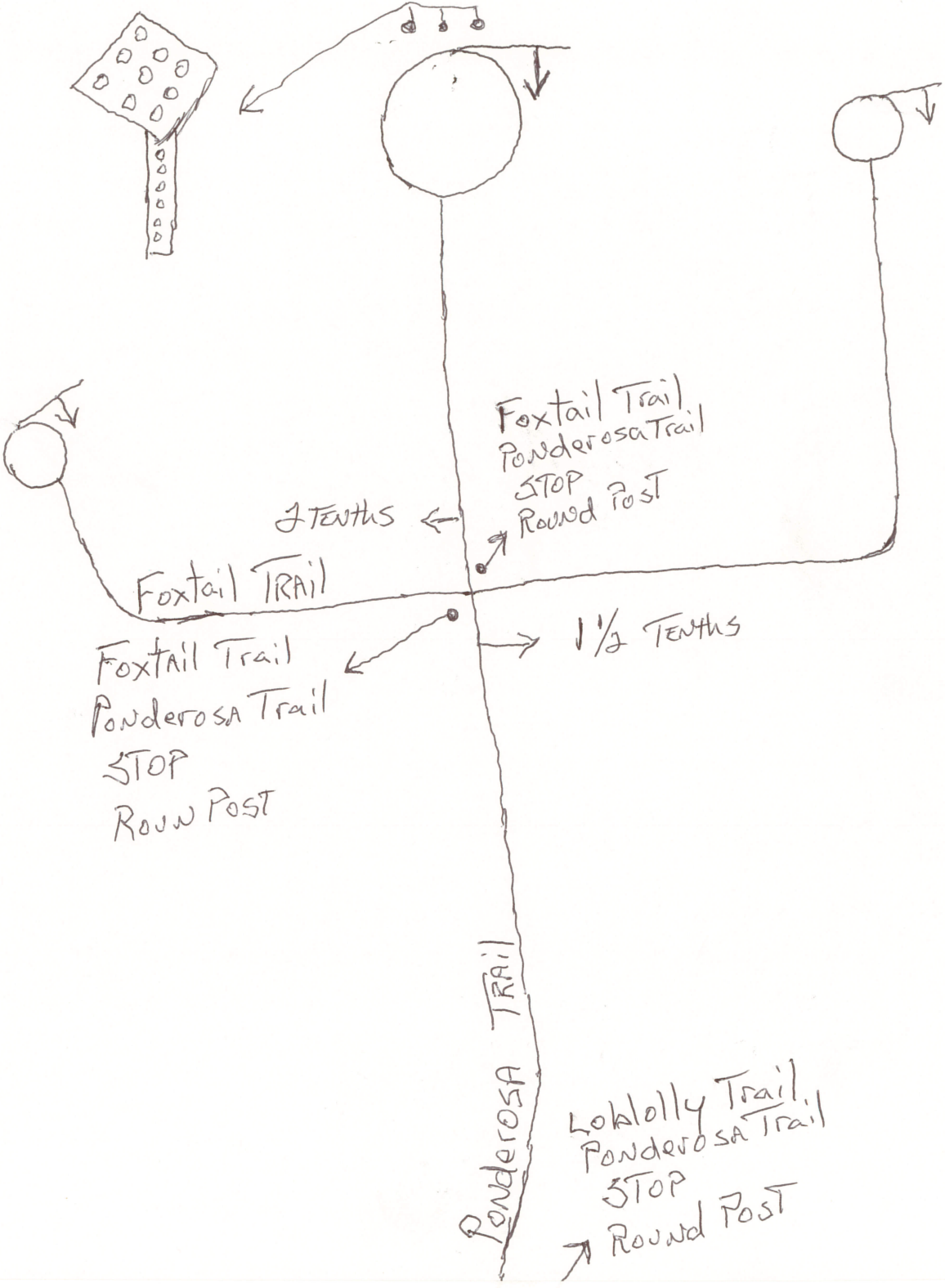
Subscribed and sworn to, before me, the undersigned authority, this 13th day of June, 2017.

Notary Public

LOMA C. GEORGE
Notary Public State of Texas
Commission Expires
FEBRUARY 7, 2019

February 7, 2019
My commission expires: _____

[File in minutes and submit to grand jury with a copy of any road work contracts for past year during ninth month of county fiscal year – Section 251.005, Transportation Code]


Foxtail Trail
Ponderosa Trail
STOP
Round Post
2 TENTHS
Foxtail TRAIL
1½ TENTHS
Foxtail Trail
Ponderosa Trail
STOP
Round Post
Ponderosa TRAIL
Loblolly Trail
Ponderosa Trail
STOP
Round Post

COUNTY OF JEFFERSON §
§
PRECINCT NO. 2 §

## ANNUAL ROAD REPORT

1. Condition of each road, culvert, and bridge in the precinct: Generally Good Condition

2. Amount of money necessary for maintenance of the precinct roads during the next fiscal year: $1,544,288 approximate total for the administrative and maintenance of roads for other budget detail see complete 2016-2017 budget.

3. Number of traffic control devices in the precinct defaced or torn down: None signs and traffic control devices are replaced/repaired when found to be damaged or in need of replacement

4. Any new road that should be opened in the precinct: None identified at this time review pending.

5. Any bridges, culverts, or other improvements necessary to place the precinct roads in good condition, and the probable cost of the improvements: See 2016-2017 Road & Bridge Precinct 2 budget.

Submitted by the undersigned on this 6th day of June 2017.

Brent Weaver
Commissioner, Precinct 2

Subscribed and sworn to, before me, the undersigned authority, this 6th day of June 2017.

Tamera L. Rains
Notary Public

TAMERA L. RAINS
Notary Public, State of Texas
Comm. Expires 03/27/2020
Notary ID 1679240

My commission expires: 03/27/2020

[File in minutes and submit to grand jury with a copy of any road work contracts for past year during ninth month of county fiscal year – Section 251.005, Transportation Code]

COUNTY OF Jefferson §
§
PRECINCT NO. 3 §

## ANNUAL ROAD REPORT

1. Condition of each road, culvert, and bridge in the precinct and the primary cause of any road, culvert or bridge degradation:

(FAIR) Burgess road needs to be opened, - West Hamshire @ I-10 due to the new Industrial Park needing 80,000 Lb. loads. $70,000.00 Due to heavy delivery truck loads and increased traffic

2. Amount of money necessary for maintenance of the precinct roads during the next fiscal year: $155,000.00

3. Number of traffic control devices in the precinct defaced or torn down: 5%

4. Any new road that should be opened in the precinct: Burgess Road

5. Any bridges, culverts, or other improvements necessary to place the precinct roads in good condition, and the probable cost of the improvements: OLD BIG HILL BRIDGE

Submitted by the undersigned on this 15 day of June 2017.

Commissioner, Precinct 3

Subscribed and sworn to, before me, the undersigned authority, this 15 day of June, 2017.

Shenita L. Keyes
Notary Public

State of Texas
My commission expires: 01-20-2021

SHENITA L. KEYES
Notary Public, State of Texas
Comm. Expires 01-20-2021
Notary ID# 12677857-5

[File in minutes and submit to grand jury with a copy of any road work contracts for past year during ninth month of county fiscal year – Section 251.005, Transportation Code]

Item 1 has been revised to include the primary cause of any road, culvert or bridge degradation (likely overweight oil & gas truck traffic) as required by S.B. 1747

**COUNTY OF JEFFERSON** §
§
**PRECINCT NO. 4** §

## ANNUAL ROAD REPORT

1. Condition of each road, culvert, and bridge in the precinct and the primary cause of any road, culvert or bridge degradation:

Generally Good Condition. Primary cause of damage is overweight oil field truck traffic.

2. Amount of money necessary for maintenance of the precinct roads during the next fiscal year: $1,572,270.00 (approximate amount from 2017-2018 budget.)

3. Number of traffic control devices in the precinct defaced or torn down: None

4. Any new road that should be opened in the precinct: All roads should be open. (see attachment)

5. Any bridges, culverts, or other improvements necessary to place the precinct roads in good condition, and the probable cost of the improvements: See Precinct # 4 2017-2018 Budget.

Submitted by the undersigned on this 19th day of June 2017

Commissioner, Precinct 4

Subscribed and sworn to, before me, the undersigned authority, this 19th day of June 2017.

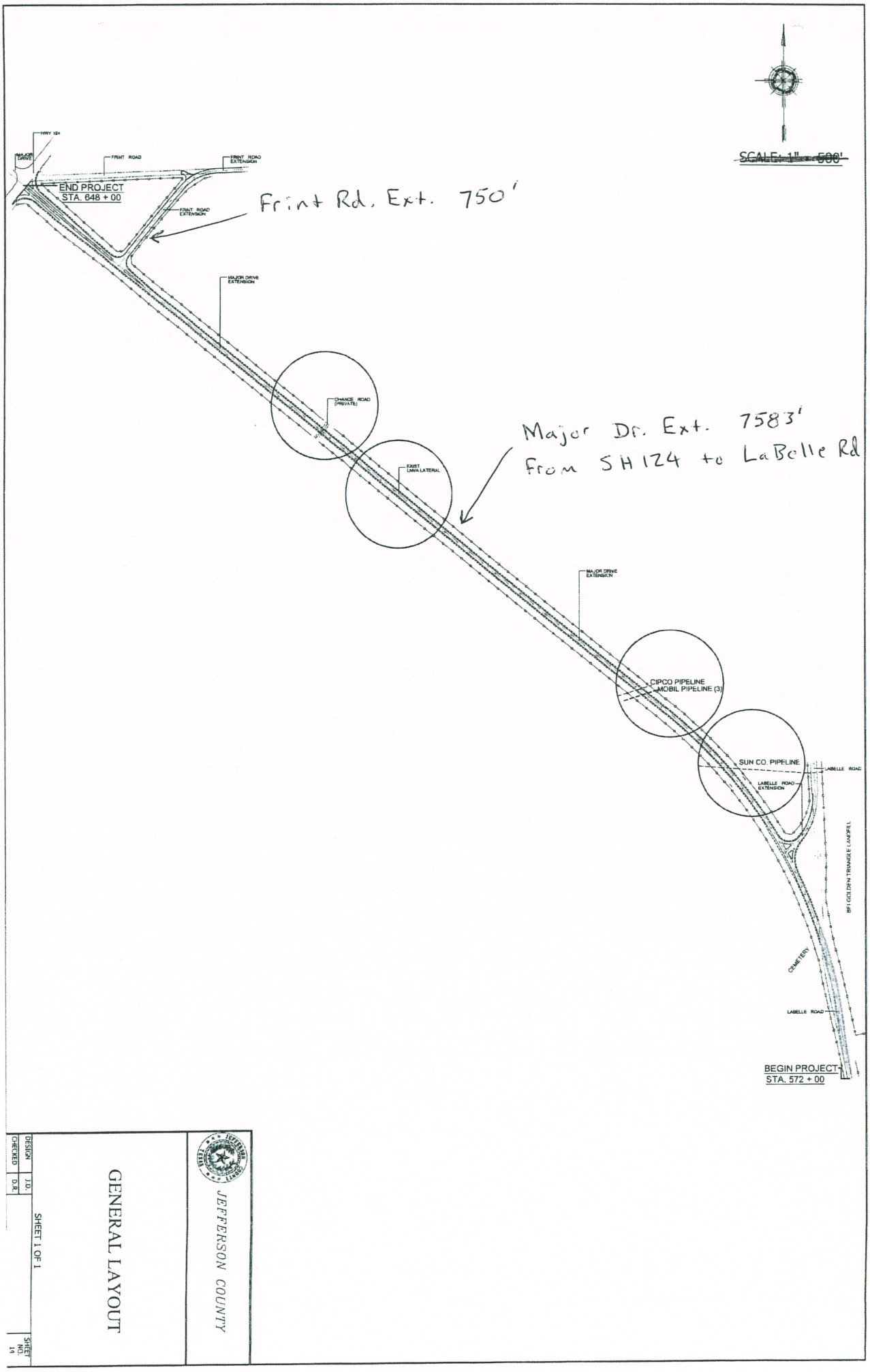
Notary Public

NATALIE ROBERTS
Notary Public, State of Texas
Comm. Expires 03/04/2020
Notary ID 13056879-5

My commission expires: 03/04/2020

[File in minutes and submit to grand jury with a copy of any road work contracts for past year during ninth month of county fiscal year – Section 251.005, Transportation Code]

Item 1 has been revised to include the primary cause of any road, culvert or bridge degradation (likely overweight oil & gas truck traffic) as required by S. B. 1747


SCALE: 1" = 500'
END PROJECT
STA. 648 + 00
FRINT ROAD
FRINT ROAD EXTENSION
Frint Rd. Ext. 750'
MAJOR DRIVE EXTENSION
CHANCE ROAD (PRIVATE)
EXIST. LAWA LATERAL
Major Dr. Ext. 7583'
From SH 124 to LaBelle Rd
CIPCO PIPELINE
MOBIL PIPELINE (3)
SUN CO. PIPELINE
LABELLE ROAD
LABELLE ROAD EXTENSION
BFI GOLDEN TRIANGLE LANDFILL
CEMETERY
BEGIN PROJECT
STA. 572 + 00
GENERAL LAYOUT
JEFFERSON COUNTY
DESIGN
CHECKED
J.D.
D.R.
SHEET 1 OF 1
SHEET NO. 14

## Special, June 26, 2017

There being no further business to come before the Court at this time, same is now here adjourned on this date, June 26, 2017