

**WORK PLAN**  
**BETWEEN WS NATIONAL WILDLIFE RESEARCH CENTER**  
**COLORADO STATE UNIVERSITY**  
**Agreement Number: 17-7440-1327-CA**

**Title:** Training domestic dogs for surveillance of avian influenza.

**I. PURPOSE/OBJECTIVES**

Human health is inexorably linked with the health of our ecosystems and the animals that occupy them. Devastation of animal populations and transmission to humans (zoonoses) are frightening consequences of uncontrolled infectious diseases. In the face of these assaults, novel tools are required for disease surveillance, diagnosis, and control. For example, it has long been speculated that diseases might be diagnosed on the basis of odor. In fact, NWRC scientists used trained mice to demonstrate that fecal odor was altered in waterfowl as a result of experimental infection with a low pathogenic avian influenza. Additional studies clearly demonstrated that the volatile metabolome (volatile odorants found in bodily secretions such as urine) was altered in a mouse model following other events, such as immunization, inflammation, or brain trauma. These results give rise to the prediction that service animals (canines in particular) could be trained to identify infected individuals or populations on the basis of disease-induced odors.

Trained detector dogs have already been shown to be invaluable tools for wildlife research. Dogs have been employed for scat, carcass, and pest detection. Furthermore, the ability of dogs to “diagnose” certain human diseases has been demonstrated in a number of scientific studies; including lung, prostate, colorectal, ovarian, breast, bladder, and skin cancers. Accordingly, a feasibility study was conducted to determine if a service animal could be trained to identify mallard ducks infected with avian influenza on the basis of fecal odor. Building upon previous work with trained mice, the domestic ferret was chosen to demonstrate that other mammals possessed the required olfactory capabilities for detecting infected individuals. Further, the studies were designed to establish that animal behavior and cognition could be exploited to convey an unambiguous “alert response” when feces from an infected duck are encountered.

The study clearly demonstrated the feasibility of deploying trained biosensors for avian influenza surveillance. When presented feces from four healthy mallards and one mallard infected with low pathogenic avian influenza (LPAI), six ferrets identified the feces of the infected donor with high accuracy. Furthermore, there is tremendous likelihood that canine detection and affirmation will be similarly successful. Thus, the cooperative research herein describes a plan to train dogs to identify waterfowl infected with avian influenza on the basis of fecal and/or carcass odor.

**II. PLAN OF ACTION**

The cooperator will provide an expert with detailed knowledge of canine training and behavior. The cooperator will identify individual dogs from animal shelters and/or rescue programs on the basis of specific behavioral and physical parameters predictive of successful training. Dogs will be transferred to the NWRC animal facilities where they will be maintained and trained. The cooperator’s representative will be hosted by NWRC for the duration of training. Using the recent feasibility study (ferrets) as a blueprint, dogs will be trained to assess avian health on the basis of odor.

Briefly, operant conditioning will be used to train domesticated dogs (*Canis lupus familiaris*) to display a specific conditioned response (i.e. passive sit alert) in response to the odor of feces and/or carcasses from avian influenza infected mallards and/or chickens and another specific conditioned response (i.e. active avoidance of sample) in response to the odor of feces and/or carcasses from non-infected control mallards and/or chickens. During discrimination tasks, biosensors will randomly encounter vials concealed in magnetized scratch boxes placed on metal panel at ground level or be asked to identify odors from a single duck or chicken carcass in a “one-at-a-time” presentation. Integrated into this protocol will be training with various dosages of infection and training with various collection days (post-infection).

Having successfully completed the initial training task, generalization to synthetic odors of mallard feces samples (1-octen-3-ol and acetoin which have previously been identified as indicative of infection) will be tested to assess specificity of the LPAI signature odor. Training and testing will also begin in a natural environment (i.e., in outdoor grass fields) to demonstrate the ability of trained dogs to identify the odor of LPAI infection in the field (including natural environments where LPAI infection may be highly prevalent in the fecal matter present).

### III. PRODUCT/DELIVERABLES

#### Timeline and Milestones:

January 2018	Identify up to five shelter/rescue dogs for training
February 2018	Infect mallards with low pathogenic avian influenza for fecal/carcass collection
August 2018	Demonstrate ability of trained dogs to identify LPAI infection in the field
September 2018	Submit final report

### IV. REPORTING REQUIREMENTS

#### A. Activity Reports

Accomplishments will be detailed in a final annual report. No other formal reporting is required.

#### B. Financial Reports

Colorado State University is required to submit an annual financial report (SF-425).

### V. ADDITIONAL INFORMATION

Designated WS Program Manager:

Dr. Bruce A. Kimball  
3500 Market Street  
Philadelphia, PA 19104  
267-519-4930  
[bruce.a.kimball@aphis.usda.gov](mailto:bruce.a.kimball@aphis.usda.gov)

Designated WS Back-up Program Manager: Dr. Susan Shriner  
4101 LaPorte Avenue  
Fort Collins, CO 80521  
970-266-6151  
[Susan.A.Shriner@aphis.usda.gov](mailto:Susan.A.Shriner@aphis.usda.gov)

Agreement Dates: September 30, 2017 to September 29, 2018

Designated Cooperator Representative: **b6**  
Department of Biomedical Sciences  
Colorado State University  
3107 Rampart Rd  
Fort Collins, CO 80521  
**b6**  
**b6** [@rams.colostate.edu](mailto:b6@rams.colostate.edu)

Cooperator Financial Point of Contact: **b6** Research Administrator  
Colorado State University  
601 S. Howes St  
408 University Services Center  
Fort Collins, CO 80523-2002  
**b6** [colostate.edu](mailto:b6@colostate.edu)

APHIS Agreements Contact: Stephanie Gallison  
4101 LaPorte Avenue  
Fort Collins, CO 80521  
970-266-6128  
[Stephanie.L.Gallison@aphis.usda.gov](mailto:Stephanie.L.Gallison@aphis.usda.gov)

- For Cooperative Agreements and Grants, will a vehicle owned or leased by APHIS be loaned to the cooperator in this agreement? ☐ Yes ☒ No

UNITED STATES DEPARTMENT OF AGRICULTURE  
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

**RECORD OF ACQUISITION OF DOGS AND CATS ON HAND**

This record is required by law (7 U.S.C. 2131-2156). (9 CFR, Subchapter A, Parts 1, 2, and 3). Failure to maintain this record can result in a suspension or revocation of license and/or imprisonment for not more than 1 year, or a fine of not more than \$1,000, or both.

1. RECORD FOR ("X")				USDA LICENSE OR REGISTRATION NUMBER		National Wildlife Research Center-USDA 4101 La Porte Avenue Fort Collins, CO 80521		3. BUSINESS YEAR		4. PAGE NUMBER					
<input type="checkbox"/> Dealer <input type="checkbox"/> Holding Facility (Submit copy to Dealer) <input checked="" type="checkbox"/> Other <input type="checkbox"/> Exhibitor (Dogs and Cats only)				84-F-0001				FROM (Mo., Day, Yr.)    TO (Mo., Day, Yr.) 01/01/18    12/31/2018		1					
IDENTIFICATION OF EACH ANIMAL BEING DELIVERED (See reverse for Breed Abbreviations)															
A. TATTOO OR USDA TAG NUMBER	B. DOG "X" M OR F				C. CAT	D. AGE OR DATE OF BIRTH	E. WT.	F. BREED OR TYPE * (If mixed breed, list 2 dominant breeds)	G. DESCRIPTION OF ANIMAL (Color, Distinctive Marks, Hair, Tail, Tattoos, etc.)	H. DATE ACQUIRED	I. NAME AND ADDRESS, USDA LICENSE OR REGISTRATION NUMBER, OR DRIVER'S LICENSE NUMBER AND STATE, VEHICLE LICENSE NUMBER AND STATE	J. Date Removed or Sold	K. Date Died or Euthanized (Specify)		
RJ 4020	X	F	M	F		~3/16		Border Collie- X	Black and White	3/20/18	Nebraska Humane Society 8929 Fort Street Omaha, NE 68134 A1107047				
RJ 8309	X	F	M	F		~4/17		Black & Tan Coonhound	Black and tan	3/20/18	Nebraska Humane Society 8929 Fort Street Omaha, NE 68134 A1181117				
RJ 6265	X	F	M	F		11/25/17		Catahoula	Tricolor	3/29/18	Picayune Veterinary Clinic 2507 Hwy 43 South Picayune, MS 39466				
RJ 0828	M	X	M	F		~6/16		Border Collie- X	Black and White	4/13/18	Rescue Ranch Inc. P.O. Box 1192 Yreka, CA 96097				
RJ 9321	X	F	M	F		1/7/17		Border Collie- X	Black and White	7/20/18	Cheyenne Animal Shelter 800 Southwest Dr. Cheyenne, WY 82007				
RJ 5165	X	F	M	F		11/24/17		Beagle-X	Black and Brown	7/30/18	Cheyenne Animal Shelter 800 Southwest Dr. Cheyenne, WY 82007				
APHIS 7005 JUL 2009		INSPECTOR USE ONLY		LAST INSPECTION (Date)		TOTAL NUMBER ANIMALS ENTERED SINCE LAST INSPECTION		COUNT TOTAL NUMBER ANIMALS ACTUALLY ON PREMISES		DIFFERENCE (+ OR -)		DATE		INITIALS	

# **BREED ABBREVIATIONS – DOGS** (*Column F*)

Afghan Hound	- AH	Dachshund	- DH	Komondor	- KM	Shih-tzu	- SI
Airedale Terrier	- AD	Dalmatian	- DL	Labrador Retriever	- LR	Silky Terrier	- ST
Akita	- AK	Doberman	- DB	Lhasa Apso	- LA	Spitz	- SZ
American Bull Terrier	- AB	Elkhound	- EH	Malamute	- MM	Springer Spaniel	- SR
Basenji	- BS	English Bulldog	- EB	Mastiff	- MA	Staffordshire Bull	- SA
Basset Hound	- BH	English Setter	- ES	Maltese	- MT	Terrier	
Beagle	- BE	Eskimo Dog	- ED	Miniature Pinscher	- MP	Walker	- WK
Bedlington Terrier	- BL	Foxhound	- FH	Newfoundland	- NF	Weimaraner	- WI
Bichon Frise	- BF	Fox Terrier	- FT	Old English Sheepdog	- OE	Welsh Corgi	- WC
Black and Tan	- BT	French Bulldog	- FB	Pekingese	- PK	Whippet	- WH
Coonhound		German Shepherd	- GS	Pomeranian	- PM	Yorkshire Terrier	- YT
Bluetick	- BK	German Short Haired	- SH	Poodle	- PO	Other ( <i>Specify</i> )	
Boston Terrier	- BO	Pointer		Pug	- PU		
Boxer	- BX	Golden Retriever	- GR	Redbond Coonhound	- RB		
Bullmastiff	- BM	Gordon Setter	- GO	Rhodesian Ridgeback	- RR		
Cairn Terrier	- CT	Great Dane	- GD	Rottweiler	- RW		
Catahoula	- CU	Great Pyrenees	- GP	Saint Bernard	- SB		
Chihuahua	- CA	Greyhound	- GH	Samoyed	- SM		
Chinese Crested Dog	- CD	Husky	- HK	Schipperkee	- SK		
Chow-Chow	- CC	Irish Setter	- IS	Schnauzer	- SN		
Cocker Spaniel	- CK	Jack Russell Terrier	- JR	Scottish Terrier	- SC		
Collie	- CL	Keeshond	- KH	Shar-pei	- SP		
Coonhound ( <i>Specify</i> )	- CH	King Charles Spaniel	- KC	Shetland Sheepdog	- SS		

## **BREED ABBREVIATIONS – CATS** (*Column F*)

## **TYPE** (*Column F*)

Abyssinian - AB  
 Burmese - BU  
 Domestic Long Hair - DL  
 Domestic Short Hair - DS  
 Himalayan - HM  
 Maine Coon - MC

Manx - MX  
 Persian - PR  
 Russian Blue - RB  
 Rex - RE  
 Siamese - SI  
 Other (*Specify*)

Hound Crossbreed - HX  
 Terrier Crossbreed - TX  
 Shepherd Crossbreed - SX  
 Spaniel Crossbreed - PX

**FINANCIAL PLAN**  
**SEPTEMBER 30, 2017 TO SEPTEMBER 29, 2018**  
**BETWEEN NWRC & COLORADO STATE UNIVERSITY**

17-7440-1327-CA

**Project Title: Training domestic dogs for surveillance of avian influenza**

<b>Salary &amp; Benefits</b>	<b>Salary</b>	<b>Benefits</b>	
Research Scientist	\$ 78,000.00	\$ 21,528.00	\$ 99,528.00
Research Associate	\$ 56,000.00	\$ 15,456.00	\$ 71,456.00
Research Associate	\$ 56,000.00	\$ 15,456.00	\$ 71,456.00
Technician	\$ 35,000.00	\$ 9,660.00	\$ 44,660.00
Bowen (1%)	\$ 1,846.85	\$ 509.73	\$ 2,356.58
	<b>Subtotal</b>		\$ 289,456.58
<b>Travel</b>			
Scientific conferences			\$ 4,400.00
Dog evaluation/acquisition			\$ 2,900.00
	<b>Subtotal</b>		\$ 7,300.00
<b>Equipment</b>			
			\$ -
	<b>Subtotal</b>		\$ -
<b>Supplies/Materials</b>			
Avian infections			\$ 23,000.00
General supplies			\$ 18,000.00
	<b>Subtotal</b>		\$ 41,000.00
<b>Contractual/Services</b>			
			\$ -
	<b>Subtotal</b>		\$ -
<b>Construction</b>			
			\$ -
	<b>Subtotal</b>		\$ -
<b>Other</b>			
Dog courier transport			\$ 3,600.00
	<b>Subtotal</b>		\$ 3,600.00
	<b>Grand Subtotal</b>		\$ 341,356.58
<b>Administrative Overhead (10%)</b>			\$ 34,135.66
	<b>Grand Total</b>		\$ 375,492.24

\*Overhead capped at 10% for Universities & Non-profit Organizations.

**WORK PLAN**  
**JANUARY 1, 2017 to JUNE 30, 2017**  
**BETWEEN NWRC AND [REDACTED] b6**

**I. PURPOSE/OBJECTIVES**

This Work Plan reflects a cooperative relationship between [REDACTED] b6 (the Cooperator) and the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS), National Wildlife Research Center (NWRC) under a Cooperative Service Agreement. It outlines the mission-related goals, objectives, and anticipated accomplishments as well as the approach for training canine biosensors to detect avian influenza on the basis of fecal odors and water fowl carcasses.

It is known with certainty that some diseases are characterized by odor changes occurring in the infected individual. There is also convincing evidence that healthy individuals modify their social behaviors when exposed to infected conspecifics themselves or their body odors. In a previous study, trained mice correctly discriminated the health status of individual ducks on the basis of fecal odors when feces from post-infection periods were paired with feces from pre-infection periods. Chemical analyses indicated that avian influenza (AI) infection was associated with a marked increase of acetoin (3-hydroxy-2-butanone) in feces. In a follow-up study, trained ferrets correctly discriminated higher acetoin/octenol ratios from lower acetoin/octenol ratios depicting infected versus non-infected individuals. The trained ferrets then easily transitioned to correctly identifying fecal material from AI infected mallards in comparison to fecal material from noninfected individuals. These experiments suggest that the health status of waterfowl can be evaluated non-invasively via monitoring of volatile fecal metabolites. Furthermore, in situ monitoring using trained biosensor may be an effective tool for assessing population health.

The objective of the current agreement is to identify the breed of, and the mechanism of procurement of, biosensors to be used to identify populations and/or individual birds infected with avian influenza on the basis of fecal odors under field conditions.

**II. PLAN OF ACTION**

The research will be a collaborative effort between [REDACTED] b6 who holds a Ph.D. in behavioral neuroscience, and the APHIS representative located at Monell. The APHIS representative will provide technical assistance and intellectual contributions. [REDACTED] will maintain oversight of the research. The APHIS representative will provide broad scientific oversight to ensure that APHIS priorities are maintained. The cooperator representative will be responsible for developing the specific written protocol for breed selection and animal procurement, in addition to obtaining NWRC Institutional Animal Care and Use (IACUC) approvals.

Selection of breed and acquisition of potential canine biosensor candidates will be conducted using the latest data provided in the scientific literature. Potential criteria for choosing potential breeds (or cross breeds) will include cephalic morphology, genetic markers, and behavioral testing. Once a desirable breed has been identified, other criteria will be considered prior to acquisition. This will include gender, age at acquisition, and individual behavioral testing. Biosensor candidates will be expected to make a discrimination in a complex odor environment that will consist largely of odor cues that will potentially consist of older,

decaying sources, as well as fresh sources, of AI. Due to these stringent demands, individuals with a strong, enduring motivation to work will be considered as having greater potential for success.

Once selection of breed has been completed, we will need to identify a source that will be willing to sell dogs that will be used in research. Despite the lack of invasive procedures, some resistance from certain breeders will be expected. The best way to circumvent this problem will be to have a solid plan that includes a strong environmental enrichment program, positive reinforcement training protocol, and work plan that accentuates the high level of care the potential biosensors will be experiencing during training and while performing work in the field.

A visit will be made to NWRC, Fort Collins in advance of animal acquisition to design and implement a training regimen. It is currently anticipated this trip will occur in late May 2017 after which time the cooperator will provide written recommended animal care Standard Operating Procedures (SOPs) for care and handling of animals.

### III. PRODUCT/DELIVERABLES

#### Timeline and Milestones:

March 2017	Identify breed and source of canine biosensor candidates
May 2017	Site visit of NWRC facility
June 2017	Provide recommended animal care Standard Operating Procedures (SOPs) specific to NWRC facilities in Ft Collins.

### IV. REPORTING REQUIREMENTS

#### A. Activity Reports

The ADODR meets regularly with the principle investigator to discuss progress and plan related research. Successful results will be published in a peer-reviewed journal and disseminated to other scientists via presentation at appropriate scientific meetings. Accomplishments will be detailed in an annual report.

#### B. Financial Reports

**b6** is required to submit an annual financial report (SF-425).

### V. ADDITIONAL INFORMATION

Designated WS ADODR: Bruce A. Kimball

Designated Cooperator Representative: Dr. **b6**

Agreement Dates: January 1, 2017 to June 30, 2017



Cooperator Mailing Address:

b6

Cooperator Financial Point of Contact:

Bruce A. Kimball (267) 519-4930

Attachments:

SF-424; SF-424A; Financial Plan; FFATA

**Application for Federal Assistance SF-424**

Version 02

\*1. Type of Submission:

- ☐ Preapplication  
☒ Application  
☐ Changed/Corrected Application

\*2. Type of Application

- ☒ New  
☐ Continuation  
☐ Revision

\* If Revision, select appropriate letter(s)

\*Other (Specify)  
\_\_\_\_\_

3. Date Received:

4. Applicant Identifier:

5a. Federal Entity Identifier:

USDA APHIS WS NWRC

\*5b. Federal Award Identifier:

**State Use Only:**

6. Date Received by State:

7. State Application Identifier:

**8. APPLICANT INFORMATION:**

\*a. Legal Name: **b6**

\*b. Employer/Taxpayer Identification Number (EIN/TIN):

**b6**

\*c. Organizational DUNS:

**(b) (6)**

**d. Address:**

\*Street 1:

Street 2:

\*City:

County:

\*State:

Province:

\*Country:

\*Zip / Postal Code

**b6**

**e. Organizational Unit:**

Department Name:

Division Name:

**f. Name and contact information of person to be contacted on matters involving this application:**

Prefix:

\*First Name: **b6**

Middle Name:

**b6**

\*Last Name:

Suffix:

Title: Sole proprietor

Organizational Affiliation:

\*Telephone Number:

**b6**

Fax Number:

\*Email: **b6** gmail.com

**Application for Federal Assistance SF-424**

Version 02

**\*9. Type of Applicant 1: Select Applicant Type:**

P. Individual

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\*Other (Specify)

**\*10 Name of Federal Agency:****USDA APHIS WS NWRC****11. Catalog of Federal Domestic Assistance Number:**

10 028

CFDA Title:

WS

**\*12 Funding Opportunity Number:**

\*Title:

Specificity testing in the ferret model of disease detection

**13. Competition Identification Number:**

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):****Continental USA and Alaska****\*15. Descriptive Title of Applicant's Project:**

Design and consultation for NWRC-led research of training biosensors to detect wildlife infected with avian influenza

<b>Application for Federal Assistance SF-424</b>		Version 02
<b>16. Congressional Districts Of:</b>		
*a. Applicant: PA-8		*b. Program/Project:
<b>17. Proposed Project:</b>		
*a. Start Date: 01 June 2016		*b. End Date: 31 December 2016
<b>18. Estimated Funding (\$):</b>		
*a. Federal	\$30,000	
*b. Applicant		
*c. State		
*d. Local		
*e. Other		
*f. Program Income		
*g. TOTAL	\$30,000	
<b>*19. Is Application Subject to Review By State Under Executive Order 12372 Process?</b>		
<input type="checkbox"/> a. This application was made available to the State under the Executive Order 12372 Process for review on _____		
<input type="checkbox"/> b. Program is subject to E.O. 12372 but has not been selected by the State for review.		
<input type="checkbox"/> c. Program is not covered by E. O. 12372		
<b>*20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)</b>		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U. S. Code, Title 218, Section 1001)</b>		
<input checked="" type="checkbox"/> ** I AGREE		
** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions		
<b>Authorized Representative:</b>		
Prefix: Dr.	*First Name: b6	
Middle Name: b6		
*Last Name: b6		
Suffix:		
*Title: Sole Proprietor		
*Telephone Number: b6		Fax Number:
* Email: b6@gmail.com		
*Signature of Authorized Representative: b6		*Date Signed: 5/5/16

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Standard Form 424 (Revised 10/2005)  
Prescribed by OMB Circular A-102

**Application for Federal Assistance SF-424**

Version 02

**\*Applicant Federal Debt Delinquency Explanation**

The following should contain an explanation if the Applicant organization is delinquent of any Federal Debt.

# BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. USDA/APHIS/WS	10-028	\$	\$	\$ 30,000.00	\$	\$ 30,000.00
2.						0.00
3.						0.00
4.						0.00
5. Totals		\$ 0.00	\$ 0.00	\$ 30,000.00	\$ 0.00	\$ 30,000.00
SECTION B - BUDGET CATEGORIES						
6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)	
	(1)	(2)	(3)	(4)		
a. Personnel	\$ 30,000.00	\$	\$	\$	\$ 30,000.00	
b. Fringe Benefits	0.00				0.00	
c. Travel					0.00	
d. Equipment					0.00	
e. Supplies					0.00	
f. Contractual	0.00				0.00	
g. Construction	0.00				0.00	
h. Other	0.00				0.00	
i. Total Direct Charges (sum of 6a-6h)	30,000.00	0.00	0.00	0.00	30,000.00	
j. Indirect Charges					0.00	
k. TOTALS (sum of 6i and 6j)	\$ 30,000.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 30,000.00	
7. Program Income	\$	\$	\$	\$	\$ 0.00	

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Standard Form 424A (Rev. 7-97)  
Prescribed by OMB Circular A-102

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SECTION C - NON-FEDERAL RESOURCES					
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS	
8.	\$	\$	\$	\$ 0.00	
9.				0.00	
10.				0.00	
11.				0.00	
12. TOTAL (sum of lines 8-11)	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	
SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 30,000.00	\$ 12,750.00	\$ 12,750.00	\$ 4,500.00	\$
14. Non-Federal	0.00				
15. TOTAL (sum of lines 13 and 14)	\$ 30,000.00	\$ 12,750.00	\$ 12,750.00	\$ 4,500.00	\$ 0.00
SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
(a) Grant Program	FUTURE FUNDING PERIODS (Years)				
	(b) First	(c) Second	(d) Third	(e) Fourth	
16.	\$	\$	\$	\$	
17.					
18.					
19.					
20. TOTAL (sum of lines 16-19)	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	
SECTION F - OTHER BUDGET INFORMATION					
21. Direct Charges:			22. Indirect Charges:		
23. Remarks:					

## INSTRUCTIONS FOR THE SF-424A

Public reporting burden for this collection of information is estimated to average 180 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0044), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

### General Instructions

This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the latter case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

### Section A. Budget Summary Lines 1-4 Columns (a) and (b)

For applications pertaining to a *single* Federal grant program (Federal Domestic Assistance Catalog number) and *not requiring* a functional or activity breakdown, enter on Line 1 under Column (a) the Catalog program title and the Catalog number in Column (b).

For applications pertaining to a *single* program *requiring* budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the Catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the Catalog program title on each line in *Column* (a) and the respective Catalog number on each line in Column (b).

For applications pertaining to *multiple* programs where one or more programs *require* a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

### Lines 1-4, Columns (c) through (g)

*For new applications*, leave Column (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

*For continuing grant program applications*, submit these forms before the end of each funding period as required by the grantor agency. Enter in Columns (c) and (d) the estimated amounts of funds which will remain unobligated at the end of the grant funding period only if the Federal grantor agency instructions provide for this. Otherwise, leave these columns blank. Enter in columns (e) and (f) the amounts of funds needed for the upcoming period. The amount(s) in Column (g) should be the sum of amounts in Columns (e) and (f).

*For supplemental grants and changes* to existing grants, do not use Columns (c) and (d). Enter in Column (e) the amount of the increase or decrease of Federal funds and enter in Column (f) the amount of the increase or decrease of non-Federal funds. In Column (g) enter the new total budgeted amount (Federal and non-Federal) which includes the total previous authorized budgeted amounts plus or minus, as appropriate, the amounts shown in Columns (e) and (f). The amount(s) in Column (g) should not equal the sum of amounts in Columns (e) and (f).

**Line 5** - Show the totals for all columns used.

### Section B Budget Categories

In the column headings (1) through (4), enter the titles of the same programs, functions, and activities shown on Lines 1-4, Column (a), Section A. When additional sheets are prepared for Section A, provide similar column headings on each sheet. For each program, function or activity, fill in the total requirements for funds (both Federal and non-Federal) by object class categories.

**Line 6a-i** - Show the totals of Lines 6a to 6h in each column.

**Line 6j** - Show the amount of indirect cost.

**Line 6k** - Enter the total of amounts on Lines 6i and 6j. For all applications for new grants and continuation grants the total amount in column (5), Line 6k, should be the same as the total amount shown in Section A, Column (g), Line 5. For supplemental grants and changes to grants, the total amount of the increase or decrease as shown in Columns (1)-(4), Line 6k should be the same as the sum of the amounts in Section A, Columns (e) and (f) on Line 5.

**Line 7** - Enter the estimated amount of income, if any, expected to be generated from this project. Do not add or subtract this amount from the total project amount, Show under the program



## INSTRUCTIONS FOR THE SF-424A (continued)

narrative statement the nature and source of income. The estimated amount of program income may be considered by the Federal grantor agency in determining the total amount of the grant.

### Section C. Non-Federal Resources

**Lines 8-11** Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

**Column (a)** - Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

**Column (b)** - Enter the contribution to be made by the applicant.

**Column (c)** - Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

**Column (d)** - Enter the amount of cash and in-kind contributions to be made from all other sources.

**Column (e)** - Enter totals of Columns (b), (c), and (d).

**Line 12** - Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f), Section A.

### Section D. Forecasted Cash Needs

**Line 13** - Enter the amount of cash needed by quarter from the grantor agency during the first year.

**Line 14** - Enter the amount of cash from all other sources needed by quarter during the first year.

**Line 15** - Enter the totals of amounts on Lines 13 and 14.

### Section E. Budget Estimates of Federal Funds Needed for Balance of the Project

**Lines 16-19** - Enter in Column (a) the same grant program titles shown in Column (a), Section A. A breakdown by function or activity is not necessary. For new applications and continuation grant applications, enter in the proper columns amounts of Federal funds which will be needed to complete the program or project over the succeeding funding periods (usually in years). This section need not be completed for revisions (amendments, changes, or supplements) to funds for the current year of existing grants.

If more than four lines are needed to list the program titles, submit additional schedules as necessary.

**Line 20** - Enter the total for each of the Columns (b)-(e). When additional schedules are prepared for this Section, annotate accordingly and show the overall totals on this line.

### Section F. Other Budget Information

**Line 21** - Use this space to explain amounts for individual direct object class cost categories that may appear to be out of the ordinary or to explain the details as required by the Federal grantor agency.

**Line 22** - Enter the type of indirect rate (provisional, predetermined, final or fixed) that will be in effect during the funding period, the estimated amount of the base to which the rate is applied, and the total indirect expense.

**Line 23** - Provide any other explanations or comments deemed necessary.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

b6

TITLE

Sole proprietor

APPLICANT ORGANIZATION

b6

DATE SUBMITTED

April 21, 2016

**SUPPLEMENTAL COOPERATOR INFORMATION SHEET****Additional information needed to fulfill FFATA requirements.**

Cooperator Name: b6		Agreement Number:	
Parent DUNS Number: (b) (6)		Primary Performance Street Address: b6	
Primary Performance City: b6		Primary Performance State: b6	
Primary Performance Zip: b6	County of Primary Performance: Montgomery		Primary Performance Country: USA
Performance in Multiple States: Yes or No No		Performance in Multiple Counties: Yes or No No	
Comments:			