U.S. Department of the Interior

Bureau of Land Management
Environmental Assessment DOI-BLM-NV-B010-2015-0005-EA

DATE: March 2015

Environmental Assessment

Barrick Gold Exploration, Inc.
Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621 [13-1A]) and Reclamation Permit No. 0159
Plan Modification, Addendum, and Amendment

File Number: NVN-066621 (13-1A, 14-1A, 14-2A)

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BLM

Mount Lewis Field Office

BLM Mission Statement

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific, and cultural values.

Abbreviations and Acronyms

%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
µhos/cm	micromhos per centimeter
AAQS	Ambient Air Quality Standards
ACEC	Areas of Critical Environmental Concern
amsl	above mean sea level
AUMs	animal unit months
BAPC	Bureau of Air Pollution Control
Barrick	Barrick Gold Exploration Inc.
BCC	Birds of Conservation Concern
BCI	Barrick Cortez, Inc.
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMD	Battle Mountain District
BLM	Bureau of Land Management
BMPs	Best Management Practices
BWPC	Bureau of Water Pollution Control
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGM	Cortez Gold Mine

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7DEOH + &&8 (3 3OQRI2SHUDWRQV3HUP LW+ LVWRU

' DWH	7LWOH1 (3$ 5HHUHQFH	) LOH1 XPEHU	3URSRVHG$FWRQ	&LWDWRQ
$XJXVW		$	GLVWXUEDQFHOPLWRQXSWR DFUHV	D
$SSURYHG -DQXDU\	+&&8 (3 ' HFLVLRQ	1 9 1	$XWKRU]HG3OQERXQGDU\ FKDQJH UHGXFWRQRI DFUHV	%/0 D
3URSRVHG 6HSW	+&&8 (3 3OQ0RGLIIFDWRQ	1 9 1 $	$JHQF\ GLUHFWHG DFWRQVWRDFFRXQWUR VXUIDFHGLVWXUEDQFHLQH[FHVVRI DFUHV	%DUUIFN D
3URSRVHG 2FWREHU	+&&8 (3 $GGHQGXP WR 3OQ0RGLIIFDWRQ	1 9 1 $ $	$JHQF\ GLUHFWHG DFWRQVWRDFFRXQWUR FRP PXQLFDWRQ VLWHV7RWDOGLVWXUEDQFH LV DFUHV	%DUUIFN E
3URSRVHG 2FWREHU	+&&8 (3 3OQ$PHQGPHQW	1 9 1 $ $ $	3URSRVHG DXWKRU]DWRQRI DGGLWRQDO DFUHVRI VXUIDFH GLVWXUEDQFH IRUDWRWDORI DFUHV	%DUUIFN F

3XUSRVHRI DQG1HHGIRU$FWRQ

7KH*HQHUDO0LQLQJ /DZ RI 0D\ 0LQLQJ /DZ DVDPHQGHG 8 6&RGH 8 6& DQG DOOR VFLW]HQVRI WKH8 6 WKHRSSRUWXQLW WR H[SORUHIRU GLVFRYHU FODLP DQG SURGXFHFHUWDLQ YDOXDEOHPLQHUDOGHSRVLWRQ WKRVHIHGHUDOODQGVWKDWDUHRSHQIRUP LQLQJ FODLP ORFDWRQ RSHQWRP LQHUDOHQW

%/0 ¶VSXUSRVHLVWRDQDO]HWKHHQYLURQP HQWDOIP SDFWRI WKH DFUHVRI VXUIDFHGLVWXUEDQFHWKDW H[FHHGVWKHDXWKRU]HG DFUHV

$GGLWRQDOO %/0 ¶VSXUSRVHLVWR SURYLGH%DUUIFN Z LWK WKHRSSRUWXQLW WR H[SORUH ORFDW DQG GHOLQHDWP HWDOGHSRVLWRQ LWP LQLQJ FODLP VRQ DQ DGGLWRQDO DFUHVRI SXEOF ODQGV DVSURYLGHG XQGHUWKH0 LQLQJ /DZ

7KHQHHG IRUWKHDFWRQ UHJDUGLQJ WKH3OQRI2SHUDWRQV0RGLIIFDWRQ $GGHQGXP DQG$PHQGPHQWLV HVWDEOVKHG E\ WKHDJHQF\¶VUHVRQVEILOW XQGHU6HFWRQ RI WKH)HGHUDO/DQG3ROF\ DQG 0DQDJHP HQW$FWRI) / 30 $ DQG WKH%/0 6XUIFH0DQDJHP HQW5HJXODWRQVDW &)5 Z KIFK LVWR UHVSRQG WR DQ H[SORUDWRQ RUP LQLQJ SODQ RI RSHUDWRQVDQG WR WKNHDQ DFWRQ QHFHVDU WR SUHYHQWXQQHFHVDU RUXQGXHGHJUDGDWRQ RI SXEOF ODQGVDVDUHXOWRI DFWRQVWKNHQ WR SURVSHFW H[SORUH DWHV GHYHORS DQG SURFHVVORRFDWEOHP LQHUDOUHVRXUFHVRQ SXEOF ODQGV

' HFLVLRQVWRE H0DGH

%DUUIFN KDVVXEP LWWG D0RGLIIFDWRQ DQG$GGHQGXP WR WKH3OQRI2SHUDWRQV 1 9 1 $ $ DQG5HFOP DWRQ3HUP LW1 R 7KH%/0 GHFLVRQ UHJDUGLQJ WKH3OQ0RGLIIFDWRQ DQG $GGHQGXP LQFOXGHVWKHIROORZ LQJ RSWRQV

- $SSURYHWKH3OQ0RGLIIFDWRQ DQG$GGHQGXP Z LWK QR P RGLIIFDWRQV

- $SSURYHWKH3ODQ0RGLILFDWRQDQG$GGHQGXP ZLWKDGGLWRQDOHQYLURQPHQWDOSURWHFWRQ PHDVXUHVQHHGHG WR SUHYHQWXQQHFHVVDU\ RUXQGXHGHJUDGDWRQRI SXEOLF OdQGV RU
- ' HQ\ WKHDSSURYDORI WKH3ODQ0RGLILFDWRQDQG$GGHQGXP

%DUUFNKDVVXEPLWWHGDQ$PHQGPHQWWR WKH3ODQRI2SHUDWRQV 1 9 1 $ DQG 5HFODPDWRQ3HUP LW R 7KH%0 GHFLVRQUHJDUGLQJ WKH3ODQ$PHQGPHQWQFXGHVWKH IROORZLQJ RSWRQV

- $SSURYHWKH3ODQ$PHQGPHQWZLWKQR PRGLILFDWRQV
- $SSURYHWKH3ODQ$PHQGPHQWZLWKDGGLWRQDOHQYLURQPHQWDOSURWHFWRQPHDVXUHVQHHGHG WR SUHYHQWXQQHFHVVDU\ RUXQGXHGHJUDGDWRQRI SXEOLF OdQGV RU
- ' HQ\ WKHDSSURYDORI WKH3ODQ$PHQGPHQW

%0 5HVSRQVHEOHDQG5HDWRQVKLS WR %0 DQG1RQ %0 3RODFLHV 3ODQV DQG3URJUDPVDQG/DQG8VH3ODQ&RQIRUPDQFH

7KH%0 KDVWHUHVSRQVHEOLW DQGDXWRULW WR PDQDJHWKHVXUIDFHDQG VXEVXUIDFHUHVRXUFHVRQ SXEOLF OdQGVDQGKDVGHVLJQDWHGOdQGVZLWKLQWKH+&&8(3DVRSHQIRUPLQHUDOH[SORUDWRQ ,QWKH %0 ' 5HFRUGRI ' HFLVRQ52' IRUWKH6KRVKRQH(XUHND5HVRXUFH0DQDJHPHQW3ODQ 50 3 %0 D WKH%0 WRWDOVLQ RENHFWXYHV DQG XQGHU0LQHUDOVWKDW%0 ZLOO

- ³0DNHDYDLODEOHDQGHQFRXUDJHGHYHORSPHQWRI PLQHUDOUHVRXUFHVWR PHHWQDWRQDO UHJIRQDO DQGORFDOQHGVFRQVXPQWZLWKQDWRQDORENHFWXYHVIRUDQ DGHTXDWH VXSSO\ RI PLQHUDOV´ DQG
- ³$VXUHWKDWP LQHUDO[SORUDWRQ GHYHORSPHQWDQG H[WUDFWRQ DUHFDUUHG RXWLQ VXFK DZ D\ DV WR PLQLP I]HHQYLURQPHQWDODQ RWKHUUHVRXUFHGPDJHDQG WR SURYLGH ZKHUHOHJDO SRVWEOH IRUWKHUHKDELOdWDWRQ RI OdQGV´

7KHP DQDJHPHQWGHFLVRQVDSSOlFDEOHWR WKHVHREENHFWXYHVDUHDVIROORZV %0 D

- / RFDWHEOHP LQHUDOV³$OOSXEOlF OdQGVLQ WKHSODQQLQJ DUHDVZLOOEHRSHQIRUP LQLQJ DQG SURVSHFWLQJ XQHWZLWKGUDZ QRUUHWXUQ WKG IURP P LQHUDOHQW´
- &XUUHQWP LQHUDOSURGXFWRQ DUHDV³5HFRJQL]HWKHVHDUHDVDVKDYLQJ DKLJKHWWQG EHWWXVHIRU P LQHUDOSURGXFWRQDQG HQFRXUDJHP LQLQJ DQG P LQLP XP HQYLURQP HQWDOGLWXUEDQFH 0DNH WKRURXJK H[DP LQDWRQVRI DOOWWVSURSRVHG IRUURWHU%XUHDXSURJUDP VLQWHHVHDUHDV´

7KH(ONR'LWWUFW52' IRUWKH(ONR50 3 %0 WWDWVLQ2ENHFWXYH XQGHU0LQHUDOVWKDW%0 ZLOO

- ³0DLQWWLQSXEOlF OdQGVRSHQIRUH[SORUDWRQ GHYHORSP HQWDQG SURGXFWRQRI P LQHUDOUHVRXUFHV ZKLOHP LWWDWQ FRQlOFWZLWKZLOOOLH ZLOG;KRUVHV UHFUHDWRQ DQG ZLOOHQHVVUHVRXUFHV´

7KHVKRUWDQGORQJ WHUP P DQDJHP HQWFWRQDSSOlFDEOHWR WKVVRENHFWXYHLVDVIROORZV %0

- ³'HVLJQDWHWKHUHVRXUFHDUHDRSHQWRPLQLPXPORFDWLRQ IRUORFDWLRQ LQHUDOHQW H[FHSWRUWKH GLVWULFW¶V DFUHDGP LQLWDWLYHVLW´

7KHP DQDJHP HQWGHFLVLRQVDQG DFWRQVLQWKH%0'6KRVKRQH(XUHND50 3%/0 D DQG WKH (ONR'LVWUFW(ONR50 3%/0 KDYHEHHQUHYLHZHG DQG WKH+&&8(33DQ0RGLIIFDWRQ $GGHQGXP DQG$PHQGP HQWUHLQFRQLRUP DQFHZLWKWKH50 3V

/DQGH&RXQW¶V3RODF\ WWDWWWKDWWKH6HFUHWDU RI WKH,QWHULRUVKRXOG XVHDOOP HDQVWR HQFRXUDJH WKHH[SORUDWRQ DQG GHYHORSP HQWRI WKHP LQHUDOUHVRXUFH / DQGH&RXQW

7KH(XUHND&RXQW0DWWU3DQ (XUHND&RXQW JRDOIRUP LQHUDOVLVW³IDFLOWWW HQYLURQP HQWO UHVRQMEOHH[SORUDWRQ GHYHORSP HQWDQG UHFOP DWRQ RI RLO JDV JHRWKHUP DO ORFDWEOHP LQHUDOV DJ J UHJ DWDQG VLP LOD UUHVRXUFHVRQ IHGHUDOODQGV´

6FRSLQJ

,QWLQDOVFRSLQJ LQFOXGHG WZR RLQWLGLVFLSOQDU WDP P HHWQJ VKHG DWWKH%0 %0' RIIFHRQ-DQXDU DQG0DUFK 5HVRXUFHVSHFLDOWVGLVFXVHG WKH3DQ RI 2SHUDWRQV0RGLIIFDWRQ $GGHQGXP DQG$PHQGP HQW(QYLURQP HQWDOLVXHVDQG WKHHQYLURQP HQWDOEDVHOLQHUHVRXUFHVZ HUH IGHQWIHG

,VXHV

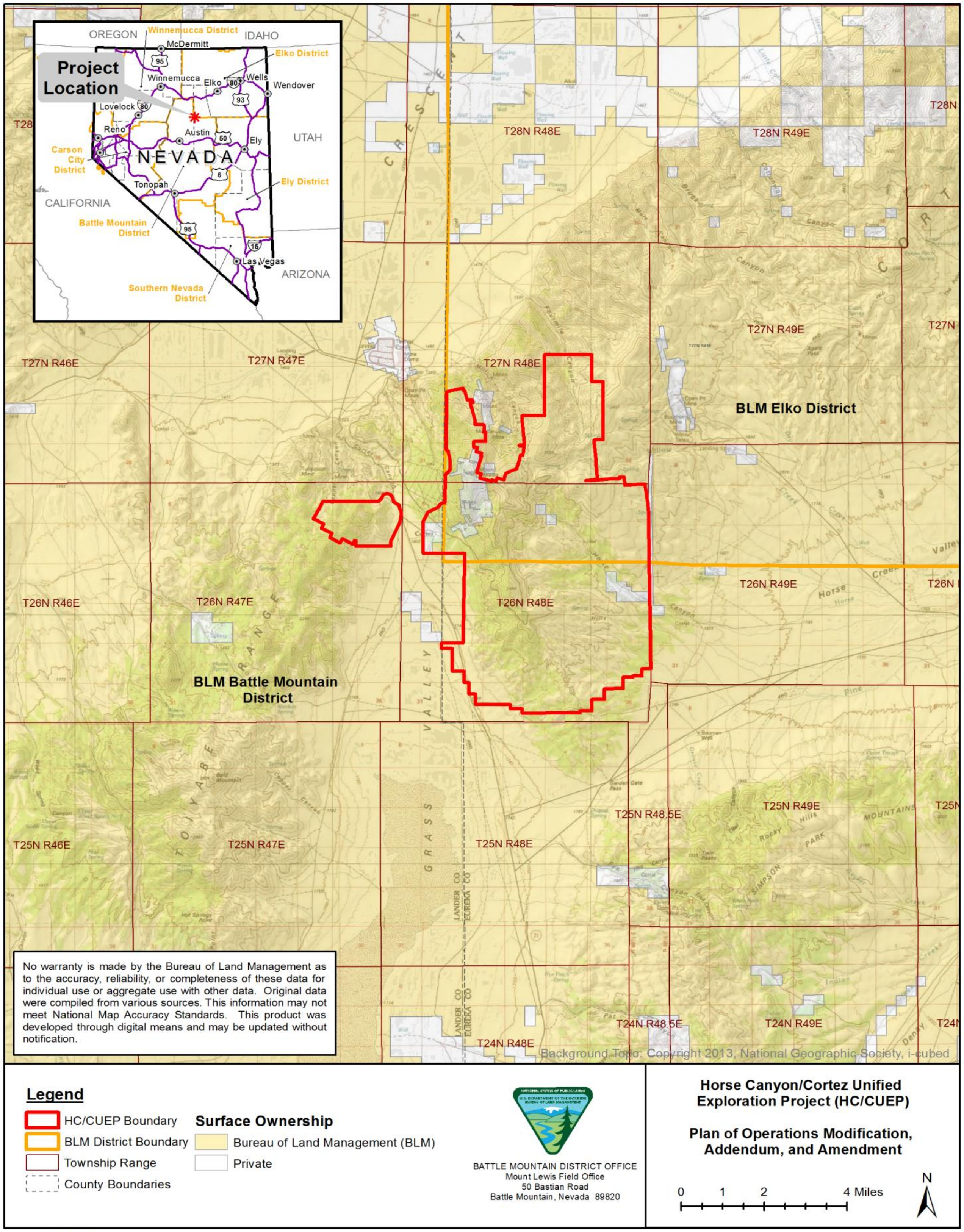
7KHLQWLQDOLQWLGLVFLSOQDU WDP GHWUP LQHG WKDWWKHIRORRZ LQJ UHVRXUFHLVXHVRFFXUDQG WKHUHRUH DUHDQD]HG LQ WKLV(\$

- \$ILU4XDOLW ±IXJLWYHGXVWHTXLSP HQWP LVLRQV
- &XOXUDO5HVRXUFHV±SRWHQWDOIP SDFWVWR H[LWQJ VLWHV XQDQWFLSDWG GLVFRYHUHV
- 0LJUDWRU %LUGV±GLVXUEDQFH KDELWWWRRWFKDQJH
- 1DWYH\$PHUFDQ5HOJIRXV&RQFHUQV±SURSHUWHVRI FXOXUDODQG UHOJIRXVIP SRUWQFH
- 1R[IRXV: HHGV,QYDLYH DQG1RQ QDWYH6SHFLHV±HWWEOLKP HQWDQG RUVSUHDG SUHYHQWWYH DQG FRQWROP HDXUHV
- 7KUHDWHQHG(QGDQJHUHG DQG&DQGLGDW6SHFLHV 3DQWDQG\QIP DOV ±*UHDWUVDJHJURXVH &DQGLGDW GLVXUEDQFH QRLVHKXP DQSUHVHQFH KDEWWWRRWFKDQJH
- :DWWV+DJDUGRXVRU6ROG±KDQGOQJ DQG GLVSRVDO
- :DWU4XDOW 6XUFH:DWU DQG*URXQGZ DWU±VHGIP HQWWRQ IORZ SRWQWDOIRU FRQWP IQDWRQ
- :HWODQGV5ISDUDQ=RQHV±SRWQWDOFKDQJHORWVDQGP LW DWRQ
- *UDIQJ 0DQDJHP HQW±FKDQJHORWRI DQIP DOXQLWP RQWKV \$80V
- 5HFUHDWRQ±DOWUH[LWQJ RSSRUWXQLWHV

%DUUFN+&&8(3 3DQRI2SHUDWRQV0RGLILFDWRQ$GGHQGXP DQG$PHQGPHQW($

- 6RLOV± SRWDWRDOGHJUDGDWRQRUORVW HURVLRQ
- 6RFLDODQG(FRQRPLF9DOXHV± FKDQJHLQFXUUHQWXVXDWRQ
- 6SHFLDO6WXXV6SHFLHV 3DQWDQG$QLPDOV ± SRWDWRDOP RUWDOW GLWXUEDQFH KDELWDW ORVWFKDQJH
- 9HJHWDWRQ± FKDQJHLQFRP P XQLW FRP SRVLWRQ UHFDP DWRQ
-)RUHVW DQG:RRGDQG5HVRXUFHV FRP P HUFLDODQG SHUVRQDOILUHZRRG FROOHFWRQ SLQHQXW FROOHFWRQ
- 9LVXDO5HVRXUFHV± FRP SODQFHZLWKH[LWQJ YLVXDOFDWHV
- :ODWHU± GLWXUEDQFH QRLVHKXP DQSUHVHQFH KDELWDWORVWFKDQJH

)LJXUH 3URMHFW9LFLQLW\



Date: 11/12/2014

$ OWHUQDWLYHV, QFOXGLQJ WKH3 URSRVHG $ FWLRQ

7 KLVFKDSWHUGHVFULEHVWKHDOWHUQDWLYHVDQDO]HGLQWKLV($ 7 KH3 URSRVHG $ FWLRQLVWKH3OQ RI 2 SHUDWRQV0 RGLILFDWRQDQG $ GGHQGXP DVGHVFULEHGE\ %DUUFNLQWKH*Horse Canyon/Cortez Unified Exploration Project Plan of Operations Agency-Requested Modifications NVN-066621 (13-1A) and Reclamation Permit No. 0159 revised* 6HSWHP EHU %DUUFN D DQGLQ WKH*Horse Canyon/Cortez Unified Exploration Project Addendum to the Revised Plan of Operations Modification NVN-066621 (13-1A, 14-1A) and Reclamation Permit No. 0159* 2 FWREHU %DUUFN E

,QFOXGHGLQWKH3 URSRVHG $ FWLRQLVWKH3OQ RI 2 SHUDWRQV$ P HQGP HQWDVGHVFULEHGE\ %DUUFN LQWKH*Horse Canyon/Cortez Unified Exploration Project Plan of Operations Amendment NVN-066621 (13-1A, 14-1A, 14-2A) and Reclamation Permit No. 0159* 2 FWREHU %DUUFN F

7 KLVFKDSWHUDOR SUHVHQWVWKH1 R$ FWLRQ$ OWHUQDWLYH 6HFWLRQ DQGDGLVFXVVLRQRI SDWW SUHVHQWDQG UHDVRQDEO\ IRUHVHEOHIXWXUHDFWLRQV 5)) $ V 6HFWLRQ

7 KH%/ 0 KDVUHYLHZ HG WKH3 URSRVHG $ FWLRQ WR GHWHUP LQHZ KDWP SDFW LI DQ\ Z RXOG RFFXU DQG LI P RGLILFDWRQVDUHQHHGHG WR P LWLJDWSRWQWDOP SDFW 7 KH1 R$ FWLRQ$ OWHUQDWLYHZ DV FRQVLGHUHG DQG DQDO]HG WR SURYLGHDEDVHOLQHIRUFRP SDULVRQRI WKHIP SDFWRI WKH3 URSRVHG $ FWLRQ 1 R RWKHUDOWHUQDWLYHVZ HUHLGHQWLIHG

+ &&8 (3 3OQ RI 2 SHUDWRQV

7 KH+ &&8 (3 3OQZ DVDSSURYHGLQ %/ 0 E DQGDIILP HGDVP RGLILHGLQ %/ 0 7 KH ' HFLVRQ5 HFRUG ' 5) LQGLQJ RI 1 R6LJ QLILFDQWP SDFW) 2 1 6, Z DV UHSODFHG DQG VXSHUVHGHG E\ WKH0 D ' 5) 2 1 6, %/ 0 D DQG$ XJ XWW ' 5 %/ 0 D 7 KH+ &&8 (3 ' 5 DOORZ HG IRUXS WR DFUHVRI VXUDFHGLWXUEDQFH Z LWKLQ WKH3OQ ERXQGDU\ DQG HOP LQDWHG WKH DFUHLQFUP HQWDOP IW

7 KH+ &&8 (3 3OQ UHDHG RQ WWQGDG XQLWUHDP HDXUHP HQWWR FDOFXODWHGLWXUEDQFHRI URDGV GULOSDGV DQG VXP SV 2 YHUWP H DVH[SORUDWRQ SURFHGXUHVDQG HTXLSP HQWFKDQJ HG H[SORUDWRQ GLWXUEDQFHH[FHHGHG WKH WWQGDG XQLWUHDP HDXUHP HQW ,QUHSRQVHWR WKH 1 RWFHRI 1 RQFRP SOLDQFH2 UGHU %DUUFN GHWHUP LQHG WKDWWKHUHZ HUHQRWQGHTXDWP DQDJ HP HQW FRQWROVWR LGHQW\ DQG YHUI\ DFWXDOXUDFHGLWXUEDQFH 6XLYH VWR DFFXUDW) GRFXP HQW VXUDFHGLWXUEDQFHZ HUHFRQGXFWG DFFRUGLQJ WR DUHYLVHG SURWFRO **$ SSHQGL[$** 7 KHUHYLVHG VXLYH GHWP LQHG WKDWFXUUHQWXUDFHGLWXUEDQFHLQ WKH+ &&8 (3 DUHDWRWDO DFUHV 7 KLV LQFOXGHV DFUHVRI RSHQ DQG DFWYHURDGV DFUHVRI RSHQ DQG DFWYHGULOSDGVDQG VXP SV RQHDFUHRI FRP P XQLFDWRQ VLWW DQG DFUHVRI VXUDFHGLWXUEDQFHWKDWKDVEHHQ UHFRQWXUHG DQG VHHGHG 1 RQHRI WKLVDFUHDJ HKDVEHHQ UHOHDVHG IURP WKHUHFODP DWRQ DWXUDQFHE\ %/ 0 RU WKH1 ' (3

7 KH+ &&8 (3 LVORRFDWHG DSSUR[IP DWH\ P LOHVVRXWZ HWWRI (OR 1 HYDGD DQG LVDFFHVVHG YID1 HYDGD6 WDWH5 RXW RU1 HYDGD6 WDWH5 RXW 7 KHDUHDFRYHUHG E\ WKHDSSURYHG

+ & &8 (3 3OQQLVORRFDWGLQ/ DQGHUDQG(XUHNDFRXQWHV 1 HYDGDZ LWKLQ SRUWRQVRI 7 RZ QWKLS 7 1 RUWK 1 5 DQJH 5 (DVW(VHFWRQV DQG 7 1 5 (VHFWRQV DQG DQG 7 1 5 (VHFWRQV DQG DV VKRZ QRQ) **LJXUH .**

3URSRVHG $ FWRQ

7 KHVH WR FRP SRQHQWV RI WKH 3URSRVHG $ FWRQ DUH GHVFUEHG EHORZ

3OQQLQJ RI 2 SHUDWRQV 0 RGLLIFDWRQ DQG $ GGHQGXP

7 KH %/ 0 LVXHG D 1 RWFHRI 1 RQFRP SOLDQFH 2 UGHUWR %DUUIFN GDWG ' HFHP EHU IRORZ LQJ %/ 0 IIHOGLQVSHFWRQV %DUUIFN Z DVGLUHFWHG WR DFFRXQWUDQOVXUDFHGLVXUEDQFH DVVRFLDWG Z LWK WKH + & &8 (3 3OQQLQJ RI 2 SHUDWRQV DQG WR VXEP LWD 3OQQ 0 RGLLIFDWRQ 7 KH IQYHQWRU UHVXOWG LQ GRFXP HQWDWRQ RI DFUHVRI VXUDFHGLVXUEDQFH %DUUIFN VXEP LWWG D 0 RGLLIFDWRQ WR WKH 3OQQ WR WKH %/ 0 IQ0 D\ IQUHVSRQVHWR WKH 1 RWFHRI 1 RQFRP SOLDQFH 2 UGHU $ UHYLVHG 3OQ 0 RGLLIFDWRQ Z DVVXEP LWWG IQ 6HSWP EHU WR DGGUHVV %/ 0 DQG 1 ' (3 FRP P HQWRQ WKH 0 D\ VXEP LWWO

$ VHFRQG 1 RWFHRI 1 RQFRP SOLDQFH 2 UGHUZ DVLVXHG WR %DUUIFN GDWG 6HSWP EHU 7 KH 2 UGHUUHTXLUHG %DUUIFN WR VXEP LWQ IQYHQWRU RI VXUDFHGLVXUEDQFHDVRFLDWG Z LWK FRP P XQLFDWRQ GHYLFHV VLWV DQG OREFDWRQVZ KHUH VXUDFHGLVXUEDQFHKDVRFFXUUHG RUZ KHUH DSSXUWQDQFHVRUGHYLFHVDUHWP SRUDUL RUSHUP DQHQW DIII[HG RUOREFDWG RQ WKHJ URXQG Z LWKQ WKH + & &8 (3 ERXQGDU ' XUQJ WKLVIQYHQWRU DQ DGGLWRQDOIRXUDFUHVRI VXUDFH GLVXUEDQFHZ DVDFFRXQWG IRU UHVXOWJ IQGRFXP HQWDWRQ RI DWRWORI DFUHVRI GLVXUEDQFH %DUUIFN VXEP LWWG DQ $ GGHQGXP WR WKH 3OQ RI 2 SHUDWRQV 0 RGLLIFDWRQ WR WKH %/ 0 IQ2 FWREHU IQUHVSRQVHWR WKH VHFRQG 1 RWFHRI 1 RQFRP SOLDQFH 2 UGHU

7 KH 0 RGLLIFDWRQ DQG $ GGHQGXP DGG WKH IROORZ IQJ HOP HQW DVUHTXLUHG E\ WKH %/ 0 WR WKH + & &8 (3 3OQQ RI 2 SHUDWRQV

- $ QHZ P HWKRGROORJ\ WR DFFXUDWOO WLFN DQG UHSRUWXUDFHGLVXUEDQFHDVRFLDWG Z LWK H[SORUDWRQ DFWLYLWHV **$ SSHQGL[$**
- $ QLQYHQWRU RI FXUUHQWXUDFHGLVXUEDQFH
- $ UHVWUFWRQ RQ QHZ VXUDFHGLVXUEDQFHXQGHUWKH 3OQ 0 RGLLIFDWRQ DQG $ GGHQGXP XQWLO DFUHJ HKDVEHHQ UHFODLP HG DQG UHOHDVHG
- $ UHFODP DWRQ SOQQ IRUDOOVXUDFHGLVXUEDQFHVDVRFLDWG Z LWK FRP P XQLFDWRQ GHYLFHV DQG VLWV
- $ QXSGDWG 5 &(DQG
- $ UHFODP DWRQ IIQDQFLDOJ XDUDQWHHWR FRYHUH[LWQJ DQG IXWXUHGLVXUEDQFHVFRQWWQHG IQ WKHP RGLLHG H[SORUDWRQ SOQQ

%DUUIFN DSSOLHG WKHQHZ VXUYH\ SURWRFROHQWWOHG *HC/CUEP Surface Disturbance and Reclamation Survey Protocol* 0 D\ **$ SSHQGL[$** IQ WKHDWHWP HQWRI FXUUHQW

GLVWXUEDQFH 3URFHGXUHVIRUWDFNLQJ VXUIDFHGLVWXUEDQFHZHUHIP SURYHGE\ IP SOHP HQWQJ WKH XVHRI VXUYH\ JUDGHHTXLSP HQWDQG RUDHUDOSKRWRJUDSK\ %DUUFN ZLOOQR OQJHUXVHWKH WWQGDUG]HGSDG VXP S DQG URDGGIP HQWRQVWKHWWP DWGLVXUEHGDFUHDJH ,QWKHIXWXUH DQQXDOWRWDOVZLOOEHVXEP LWWHG WR WKH1'(3DQG WKH%/0 7KHQHZ SURWRFROGGUHVHVJHQHUDO VXUYH\ SURFHGXUHVIRUGLVWXUEDQFHDFWXYLWLHVFRQGXFWHG ZLWKQ WKH+&&8(3 3DQ ERXQGDU\ UHDDWG WR FRQWXFWRQ DQG UHFOP DWRQ DFWXYLWLHVSHUUP HGE\ %DUUFN

$VSDUWRI WKHDJHF\ GLUHFWHG DFWRQV DUHMVHG5&(IRUWKHFXUHQWGLVWXUEDQFHZ DVVXEP LWWHG WR WKH%/0 DQG WKH6WDWHRI 1HYDGD DVUHTXLUHGE\ WKH2UGHUV DQG WKHUHFOP DWRQERQG KDV EHHQ ICFUHDVHG WR FRYHUWKHFRWWRI UHFOP IQJ WKHFXUHQWGLVWXUEDQFH DFUHV 7KH5&(WRWOICFXGHVDQ DGGLWRQDOICLYHDFUHVRI VXUDFHGLVWXUEDQFH WR DOORZ IRUIP SOHP HQWWRQ RI DGGLWRQDOVHGIP HQWDQG HUVIRQFRQWROVDVGLUHFWHG E\ WKH%/0

$SSURYDORI WKH3DQ0RGLIDWRQ DQG$GGHQGXP Z RXOG DOORZ H[SORUDWRQ DQG UHFOP DWRQ DFWXYLWHVZ LWKQ WKH+&&8(3 3DQ DUHD WR FRQWQXHXQGHUWKHWWP VRI SHUP LWVDQG DSSURYDOV DVDXWRU]HGE\ WKH%/0 DQG WKH6WDWHRI 1HYDGD %DUUFN DQWFLSDWHVWKDWWKHP DJIP XP QXP EHURI GUOOUJ VZ LWKQ WKH+&&8(3 DUHD DWDQ\ RQHWP HFRXOGEHXS WR GUOOUJ VSHU GD\ %DUUFN Z RXOGEHDXWRU]HGWR FRQGXFWH[SORUDWRQ RQ DUHDVZ LWKQ WKH+&&8(3 3DQ ERXQGDU\ WKDWKDYHEHHQ UHFOP HGEXWZ KIFK KDYHQRW HWEHHQ UHOHDVHGIURP UHFOP DWRQ ERQGLQJ 7KLV($ GLVFORVHVWKHFXUHQWHQYLURQP HQWDOFRQGLWRQVRI WKHH[LWWQJ VXUDFH GLVWXUEDQFHWRWDORI DFUHV

&XUUHQW6XUDFH'LVWXUEDQFH,QYHQWRU\

$VRI $XJXVW GUOOKRODVZ HUHFRP SOHWHG ZLWKQ WKH+&&8(3 DUHD 7KHP DWRUW RI WKHGUOOKRODVDUHFRUHKRODVZ LWK DUHYHLVHFLFXODWRQ 5& SUHFRODU 7KHDFUHDJHZ KIFK KDVEHHQ SUHYRXVO\ UHFRQWXUHG DQG VHGHGLVIQFOXGHGIQ WKHWRWDOGLVWXUEDQFHVIQFHQRQHRI WKDWZFUHDJHKDVEHHQ UHOHDVHGE\ WKH%/0 DQG1'(3IURP UHFOP DWRQERQGLQJ &XUUHQW VXUDFHGLVWXUEDQFHWRWDOV DFUHV DVVXP P DU]HGIQ **7DEOH** .

7DEOH &XUUHQW6XUDFH'LVWXUEDQFHIQ+&&8(3 $UHD

'LVWXUEDQFH7\SH	**3ULYDWH $FUHV**	**3XEOLF $FUHV**	**7RWDO $FUHV**
'\UOOD5RDGV SHUFHQW 8QGHUOOIQJ6RSH			
'\UOOD5RDGV! 8QGHUOOIQJ6RSH			
'\UOOD3DGVDQG6XP SV 8QGHUOOIQJ6RSH			
'\UOOD3DGVDQG6XP SV! 8QGHUOOIQJ6RSH			
7UHQFKHV 8QGHUOOIQJ6RSH			
7UHQFKHV! 8QGHUOOIQJ6RSH			
&RP P XQLFDWRQV6LWHV 8QGHUOOIQJ6RSH			
&RP P XQLFDWRQV6LWHV! 8QGHUOOIQJ6RSH			
([LVWQJ6HGIP HQW(URVIRQ&RQWUROV 8QGHUOOIQJ6RSH			
([LVWQJ6HGIP HQW(URVIRQ&RQWUROV! 8QGHUOOIQJ6RSH			

7 DEOH &XUUHQW6XUUHQF' LVWXUEDQFHLQ+&&8(3 $UHD

' LVWXUEDQFH7 \SH	3 ULYDWH $ FUHV	3 XEOLF $ FUHV	7 RWDO $ FUHV
* HRSK\ VLFDO$ FWLYLWLHV 8 QGHUOLQJ 6RSH			
* HRSK\ VLFDO$ FWLYLWLHV! 8 QGHUOLQJ 6RSH			
6XUUFH' LVWXUEDQFH5 HFRQRXUHG6HHGHG 8 QGHUOLQJ 6RSH			
6XUUFH' LVWXUEDQFH5 HFRQRXUHG6HHGHG! 8 QGHUOLQJ 6RSH			
7 RWDO			

3 OQ RI 2 SHUDWRQV$ P HQGP HQW

%DUUFN VXEP LWWG D3 OQ RI 2 SHUDWRQV$ P HQGP HQWWR WKH%/ 0 IQ2 FWREHU Z KLFK SURSRVHV WR LQFUHDVH WKH GLVWXUEDQFH DXWKRUL]HG WR DFUHV $ SSURYDO RI WKH3 OQ$ P HQGP HQW Z RXOG DOORZ IRUXS WR DFUHVRI VXUFHGLVWXUEDQFHIRUH[SORUDWRQ DFWLYLWHVLQFOXGLQJ RYHUQQG DFFHVV QHZ URDG FRQVWXFWRQ J HRSK\ VLFDOQQ VLV WHQFKLQJ WWWZ HOV P RQLWRULQJ Z HOV FRP P XQLFDWRQ VLWV FRQVWXFWRQ RI H[SORUDWRQ GULOOSDGVDQG VXP SV DQG UHFOP DWRQ 7 KHH[SORUDWRQ WHFKQLTXHVSURSRVHG WR RFFXUDUHGHFUEHGLQ 6HFWRQ 7 KH$ P HQGP HQW Z RXOG DOORZ IRUH[SORUDWRQ DFWLYLWHVWR RFFXUZ LWKLQ WKH+&&8(3 3OQ ERXQGDU\ EXWZ LWKRXW FRQWDQWRRQ\ RSHQ DQG DFWLYHDUHDV DVZ HOODV VSHFLI\ WKDWXUUFHGLVWXUEDQFHDFWLYLWHV P D\ LQFOXGHFRP P XQLFDWRQ VLWV

7 KH3 OQ$ P HQGP HQWZ RXOG LQFRUSRUDWH SURWHFWFRP SRQHQWVGHVFUEHG IRUWKH3 OQ 0 RGLIIFDWRQ DQG$ GGHQGXP 7 KLV($ GLVFORVHVWKHHQYLURQP HQWDOFRQGLWRQVRI WKHSURSRVHG VXUUFHGLVWXUEDQFHWRWWORI DFUHVDQG DQD\]HVWKHHIIHFWFRP SDUHG WR WKHH[LWWQJ DFUHVRI VXUUFHGLVWXUEDQFH

3 OQ RI 2 SHUDWRQV$ P HQGP HQW3 URSRVHG ' LVWXUEDQFH

8 QGHUWKH+&&8(3 3OQ$ P HQGP HQW%DUUFN SURSRVHVWR LQFUHDVHWKHWRWDOXWRU]HG GLVWXUEDQFHE\ DQ DGGLWRQDO DFUHVWR DFUHV

$ VRI $ XJ XW GULOOKRODVKDYHEHHQ FRP SOHWHG Z LWKLQ WKH+&&8(3 3OQ ERXQGDU\ 0 DQ\ RI WKHSDGVKDYHP XOWSOHKRODVGULOOHG Z LWKLQ WKHSDG GLVWXUEDQFHDUHD %DUUFN DQWFLSDWHV WR DGGLWRQDOGULOOKRODVZ LOOEHFRP SOHWHG LQ WKHIXWXUH XQGHUWKH3 OQ $ P HQGP HQW7 KHP D[IP XP QXP EHURI KRODVRSHQ DWDQ\ RQHWP HZ LOOEH GULOOKRODV

7 DEOH SUHVHQWWKHHWWP DWG VXUUFHGLVWXUEDQFHDWRFDWG Z LWK WKH+&&8(3 3OQ $ P HQGP HQW7 KHUHP D\ EHDGXWW HQWVWR WKHDFUHDJHHWWP DWG E\ GLVWXUEDQFHWWSHGHSHQGLQJ RQ WKHUHVXOWIURP WKHH[SORUDWRQ SURJ UP $ P DS RI SURSRVHG URDG DQG SDG FRQWXFWRQ IRU WKHIRORZ IQJ \HDUZ RXOG EHVXEP LWWG WR WKH%/ 0 IQ WKHZ RUN SOQ SURUWRIQLWDWRQ RI GLVWXUEDQFHDFWLWLWHV

7 DEOH 3 OQ RI 2 SHUDWRQV$ P HQGP HQW(VWP DWG 6 XUIDFH' LVWXUEDQFH

' LVWXUEDQFH7 \ SH	3 ULYDWH $ FUHV	3 XEOLF $ FUHV	7 RWDO $ FUHV
' ULOO5 RDGV SHUFHQW 8 QGHUOLQ 6RSH			
' ULOO5 RDGV! 8 QGHUOLQ 6RSH			
' ULOO3 DGVDQG 6XP SV 8 QGHUOLQ 6RSH			
' ULOO3 DGVDQG 6XP SV! 8 QGHUOLQ 6RSH			
7 UHQFKHV 8 QGHUOLQ 6RSH			
7 UHQFKHV! 8 QGHUOLQ 6RSH			
&RP P XQLFDWRQV6 LWHV 8 QGHUOLQ 6RSH			
&RP P XQLFDWRQV6 LWHV! 8 QGHUOLQ 6RSH			
* HRSK\ VLFDO$ FWXYLWHV 8 QGHUOLQ 6RSH			
* HRSK\ VLFDO$ FWXYLWHV! 8 QGHUOLQ 6RSH			
6XUIDFH' LVWXUEDQFH5 HFRQRXUHG 6HHGHG 8 QGHUOLQ 6RSH			
6XUIDFH' LVWXUEDQFH5 HFRQRXUHG 6HHGHG! 8 QGHUOLQ 6RSH			
7 RWDO			

+ & &8 (3 3 OQ([SORUDWRQ$ FWXYLWHV

([SORUDWRQ DFWXYLWHV RI WKH 3 URSRVHG $ FWRQ Z RXOG LQFOXGH RYHUDOO DQG DFFHVV QHZ URDG FRQVWXFWRQ J HRSK\ VLFDOODQDO VLV WHQFKLQJ WHWZ HOV P RQLWRULQJ Z HOV FRQVWXFWRQ RI H[SORUDWRQ GULOOSDGVDQG VXP SV DQG UHFOP DWRQ 7 KHVH DFWXYLWHV Z RXOG EH WDUJHWHG DFFRUGLQJ WR WKH UHFOP DWRQ VXUYH\ SUR\HFRRXWOQHG LQ $ SSHQGL $ * HRSK\ VLFDODQDO VLV WHFKQLTXHV YDU\ P HWKRGVDUH GHWHUP LQHG EDVHG RQ DFUHDJ HOP LWWRQVDQG WXJ HWQ QHHGV 7 UHQFKLQJ LQYRYHV VXUIDFH [FDYDWRQ RI P DWHULDOWK GHSWKVUDQJLQJ IURP WZR WK IHHWQ RUGHUWR DWHWV J HRORJ LFDODQG J HRWHFKQLFDOFKDUDFWHUWLWFV 7 KH WHQFKLQJ RSHUDWRQ W\SLFDOO J HQHUDWHV IURP WK VLXDUH I HHWRI GLVXUEDQFH SHUOQHDUI RRWRI WHQFKLQJ

+ & &8 (3 FRP SRQHQW VXEMHFWWR DSSURYDOXQGHU &) 5 6 XESDUW 8 VHDQG 2 FFXSDQF\ LQFOXGH WKRVH WKDWQYROYH I XOORUSDUWWP HUHMGHQFHRQ %/ 0 DGP LQLWWLHG ODQGVLQ VXSSRUWRI WKHGHYHORSP HQWRI OR FDWEOHP LQHUDOGHSRVLW 8 VHRURFFXSDQF\ LVOP LWG WK WKDWZ KIFK LV UHDVRQDEO\ LQFLGHQWWR P LQLQJ 6WXFWXUHVDWRFIDWG Z LWK WWWZ HOV P RQLWRULQJ Z HOV FRP P XQLFDWRQ VLWHV DQG VXSSRUWEXLOGLQJ VKDYHEHHQ LGHQWLIHG DV VXEMHFWWR 6XESDUW DSSURYDO

([SORUDWRQ GULOOLQJ Z RXOG EH FRQGXFWG E\ 5 & ULJ V FRUHULJ V DQG WDFN P RXQWG ULJ V (DFK ULJ LV VXSSRUWG E\ DVWDLWWZ R UXEEHUWHG YHKIFOHV 7 KHQXP EHUR GULOOULJ VRQ VLWHV YDUHV GHSHQGLQJ RQ VHDVRQDOFRQGLWRQVDQG WKHWSHRI GULOOLQJ FRQGXFWG 5 & GULOOLQJ YHUXVXVFRUH ULJ V

' ULOOKRO HGHSWKVZ RXOG UDQJHEHWZHHQ DQG IHHWEHORZ J URXQG VXUIDFH EJ V Z LWK DQ DYHUDJHGHSWK RI DERXW IHHWEJ V 7 KHGHSWK WR J URXQGZ DWUUDQJHVEHWZHHQ DQG

IHHWEJ VDQG DYHUDJ HVDERXW IHHWEJ V ' ULOOKRODHDEDQGRQP HQWZ RXOG EHFRQGXFWHG DVSHU
1 HYDGD$ GP LQLWDWLYH&RGH 1 $ & %DUUIFN Z RXOG SOXJ DOOGULOOKRODHVLQ DFFRUGDQFHZ LWK
1 $ & DVDGP LQLWLDWLYHG E\ WKH1 HYDGD' LYLVLRQ RI : DWHU5 HVRXUFHV 1 ' : 5 6 WDWH
(QJLQHH¶V2 IIIFH %DUUIFN Z RXOG FRP SOX Z LWK WKH GULOOKRODHDEDQGRQP HQWSURFHGXUHV VHWRUWK
LQ1 $ & WKURXJ K WX SUHYHQWFURW FRQWP LQDWRQ RI DTXLIHUVRUFRQWP LQDWRQ
RI J URXQG DQG VXUDFHZ DWHUV

([SORUDWRQ URDGVRUWZ R WDFN WDOVZ RXOG SURYLGHRYHOODQG DFFHVWIRUWDH P RXQWG RUWDFN
GULOOJ VZ LWK WKH VXSSRUWYHKIFOHV 7 KHURDGVZ RXOG EHJ UDGHG DQG J UDYHOHG Z KHQ QHHGHG 7 KH
J UDYHOLVREWDQHG IURP SHUP LWWG VRXUFHV 5 RDGVDQG SDGVDUHZ DWHUHG XVLQJ IUHK Z DWUDQG
GULOOSURGXFHG Z DWUDTWUVXIIIFLHQWWHWDQJ WX UHGXFHWKH VROGVFRQWQWRI WKHZ DWU

' ULOOSDGVZ RXOG EHFRQWXFWHG WX P LQWLQ VXIIFLHQWWSDFHIRUVLHRSHUDWRQ RI HTXLSP HQW
' ULOOSDGVP D\ KDYHP XOWSOHKRODHVDQG P XOWSOHVXP SV ' ULOOSDGVDQG WKHDWRFLDWHG VXP SVWX
FRQWQJ URXQGZ DWUSURGXFHG GXLQJ GULOOJ YDU\ LQ VL]HGHSHQGLQJ RQ WKHWSHRI GULOOJ
XVHG 6XP SVDUHEDFNLOOHG DWUFRP SOHWRQ RI GULOOJ IRUVLHW UHDRQVDQG WX HQXUH
SURWFWRQ RI WKHHQYLURQP HQW7 KH5 &(ICFXGHVWKHDFWXDOVXUFHGLWXUEDQFHIRUWKHGULOO
SDGVDQG VXP SV

' ULOOP XG IURP WKHSUHFRODU5 & GULOOJ Z RXOG EHFRODHFWHG IQ VXP SVDQG UHXVHG Z KHUH
SUFWFDEOHIRUWKHVXEVHTXHQWFRUHGULOOJ 3DQHOV Z ILHIHQFIQJ VQRZ IHQFIQJ HOHFWUF IHQFIQJ
DQG RWKHUWSHVRI EDUUHUVDUHIQWWOHG DQG P DIQWWQHG DURXQG HDFK VXP S WX SUHYHQWFFHWE\
ODJ HUZ ICOOLH Z ICOG KRUVHV DQG OYHWWFN) HQFIQJ DURXQG VXP SVP D\ EHUHP RYHG RQFH WKH
VXP S IVGU 2 QHHQG RI HDFK VXP S IVVOSHG WX SURYIGHDQ HWFDSHURXWIQ WKHHYHQWDQ DQIP DO
HQWUV WKHVXP S

0 RWWXP SVDUHGHMJ QHG WX SUHYHQWGIVFKDJ H KRZ HYHU FHWWQ VXP SVDUHGHMJ QHG IRU
FRQWROHG GIVFKDJ HIQ FRP SOD QFHZ LWK WWWUHJ XODWRQV : KHQ QHFHWDU WWP SRUDU GIVFKDJ H
SHUP IWZ RXOG EHREWWQHG IURP WKH1 ' (3 %XUHDX RI : DWU3 ROXWRQ &RQWRO %; 3& WX
DOOZ VXP SVWX GIVFKDJ HZ DWUIQWK HSKHP HUDOGUDQDJ HV *DeMinimis* SHUP IWDUHREWWQHG IURP
WKH1 ' (3 IRUDQ\ GIUFWGIVFKDJ HWX SHUHQIDOZ DWZ D\ V 3ISIQJ IVXVHG WX SUHYHQW
GIVFROUDWRQ RI WKHJ URXQG VXUDFHIURP EHQWRQIWZ KHQ IWVVQFFHWDU WX WDQWHUZ DWU
EHWZ HHQ VXP SV 7 KHSISHIVSODFHG GIUFWX RQ WKHJ URXQG EHWZ HHQ WKHVXP SVDQG UHP RYHG
Z KHQ WKHWDQWHUIVFRP SOHWW %DUUIFN Z RXOG XVHDIOFFXOHQWDSSURYHG E\ WKH1 ' (3 WX
DFFHOHUDWWWKHVHWWQJ RI SDWFOHV 2 WKHUSDWYHIIIQWDWRQ P HWRGV VXFK DVIIQWWUEDJ VRU
FHQWUIXJ HV DUHHP SOR\ HG WX P DQDJ HWKHVHSDUDWRQ RI IIQHSDWFXDWWVIURP WKHZ DWU

6WDZ EDOHV Z DWWHV DQG RWKHUGIYHUVRQ FRQWROVFDOHG IRUIQ WKHH[SORUDWRQ6 WRUP Z DWU
3ROXWRQ3 UHYHQWRQ3 OOQ 6: 333 DUHXWD]HG WX SUHYHQWHURVIRQ 7 KH6: 333 IVIXUWHU
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([SORUDWRQ URDGVDUHFRQWXFWHG XVLQJ ' WKURXJ K' FDWWEXOOR]HVRUDWWFN P RXQWG
H[FDYDWRU 0 DWUDOOVVIGHFDWWRUUHFOP DWRQ 7 KHIQWUP VHGP I[P D\ EHDSSOHG WX WKH
P DWUDOWRFNSIOHV 2 YHOOQG WDYHO Z LWRXWEOGIQJ IVXVHG Z KHUHSUFWFDOQG VDH (IIRUWWX
P IQIP I]HVXUFHGLWXUEDQFHDUHIP SOHP HQWG Z KHQ RYHOOQG WDYHORFFXV 3URUWX IIQDO

UHFOP DWRQ QHZ O) FRQWXFWG URDGVDUHZ DWUEDUHG WR P LQP I] HHURVRQDOGP DJ HIQ DFFRUGDQFHZ LWK VWDWXWRU\ UHJXODWRQVDQG &) 5

4 XDOWW $ VXUDQFH3OQ

%DUUIFN Z RXOG FRQWXQH WR FRQGXFW WLWLLQVSHFWRQVRI H[SORUDWRQ RSHUDWRQVDQG URDG FRQWXFWRQ RQ DGLO) EDVLV 7 KLVLQFOXGHVRQ VLWLQVSHFWRQVRI WKHRSHUDWRQ DVZ HOODVFHO) SKRQHRUUDGIR FRQWFWZ LWK WKH GUOOQJ DQG FRQWXFWRQ FUHZ VWR UHSRQG WR IIHG FRQGLWRQV DQG WR DGGUHVVXQH[SHFWG FRQGLWRQVRUSUREOPP VWKDWP D\ EHHQFRXQWUHG 6LWWVDUHH[DP LQHG WR HQVXUHWKDWFXOXUDOWW Z HWOQGV VSUQJ V VHHSV DQG GUDQDJHVDUHDYRLGHG ,QDGGLWRQ DQ\ WWSXOWRQVIP SRVHG E\ %/ 0 VXFK DVVHDVRQDOUHWWUFWRQV DUHWWUFW HQIRUFHG E\ %DUUIFN

%DUUIFN Z RXOG P RQLWRUGUOOKRHDEDQGRQP HQWR YHUI\ FRP SOLDQFHZ LWK 1 $ &

%DUUIFN P DLQWWQVDQ LQWWQDOGLWXUEDQFHSHUP LWWQJ V\ VWP WKDWFQVXUHVWKHSURWFWRQ RI FXOWXUDO EIRORJ IFDO DQG Z DWUUHRXUFHV

0 RQLWRULQJ DQG5 HSRUWQJ

%DUUIFN SURYLGHVDQ DQQXDOZ RUN SODQ WR WKH%/ 0 E\ 0 DUFK RI HDFK \ HDU Z KIFK GRFXP HQW Z RUN WR EHFRP SOHWG LQ WKHXSFRP LQJ \ HDU 7 KLVZ RUN SODQ SURSRVHVORFDWRQVIRUGUOOURDGV GUOOSDGVDQG UHOOP DWRQ DQG LQFOXGHVDP DS RI WKHSURSRVHG FRQWXFWRQ $ QDQQXDO VXP P DU\ UHSRUWVSURYLGHG WR WKH%/ 0 DQG1 ' (3 E\ $ SUIO Z KIFK GRFXP HQWVDFXDOZ RUN FRP SOHWG GXUQJ WKHSUHYRXV\ HDU ,WDOR OLWZ KIFK GUOOKRHVZ HUHOHWRSHQ DQG WKHUHDVRQ IRUWKLVDFWRQ ,QDGGLWRQ %DUUIFN SURSRVHVWR VXEP LWWR WKH%/ 0 DVKRUWOHWWUUHSRUWHDFK TXDUWUZ LWK WKHGLWXUEDQFHGDWDFROHFWG IRUWKHSUHYRXVWKUHHP RQWKV

$ SSOHFDQWFRP P LWWG (QYLURQP HQWDO3 URWFWRQ0 HDVXUHV

0 HDVXUHVWKDWZ RXOG EH WDNHQ WR SUHYHQWXQQHFHVDU\ RUXQGXHGHJ UDGDWRQ DUHGHUYHG IURP WKH J HQHUDOUHTXLUP HQWVHWWEOXKHG E\ &) 5 VXUDFHP DQDJ HP HQWUHJ XDWRQVDVZ HOODV 6WXWRI 1 HYDGDP IQIQJ UHOOP DWRQ Z DWUTXDOW Z HOOGUOOQJ DQG DUTXDOW UHJ XDWRQV

7 KH3OQ0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQWLQFRU$RUDWWWKH$ SSOHFDQWFRP P LWWG (QYLURQP HQWDO3 URWFWRQ0 HDVXUHV (30 V IGHQWLIHG IQ WKH+ & &8 (3 ,, ($ %/ 0 D DV VXSHUVHGHG E\ WKH $ GGHQGXP WR + & &8 (3 ,, ' 5) 2 1 6, %/ 0 D DQG $ XJ XWW ' 5 %/ 0 D 7 KHVHP HDXUHVDUH WKH&RQGLWRQVRI $ SSURYDOIQ WKH%/ 0 3OQRI 2 SHUDWRQV$ SSURYDO0 D\ Z KIFK IQFRU$RUDWWE\ UHHUHQFH($ 1 R 1 9 ($ DQG WKH$ GGHQGXP WR WKH($ 1 RYHP EHU Z LWK IXUWHUGHIQHG FRQWXFWRQ GHMJ QDQG RSHUDWRQDOP HDXUHVIRUGUOOQJ VXP SVDVRXWQHG IQ WKH%DUUIFN UHSRUWGDWG' HFHP EHU $ OORI WKHVHP HDXUHVFXUHQW DUH DQG Z RXOG FRQWXHWR EH IP SOHP HQWG DVWWQGDUG RSHUDWQJ SURFHGXUHVWR SUHYHQWXQQHFHVDU\ RUXQGXHGHJ UDGDWRQ DQG WR P LWJ DWWSRWQWO IP SDFWWR WKHHQYLURQP HQW $ GGLWRQDO(30 VKDYHEHHQ GHYHORSHG WR DGGUHVWKH3URSRVHG $ FWRQ RI WKH3OQ0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQW 6HH6HFWRQ IRUD GHWDLOHG GHVFUSWRQ RI WKHJ UHDWUVDJ H J URXVH *Centrocercus urophasianus* (30 V

7 KH1 R $ FWRQ $ OWLQDWWYHIQFRU$RUDWWWKH$ SSOHFDQWFRP P LWWG (30 VIGHQWLIHG IQ WKH + & &8 (3 ,, ($ %/ 0 D DVVXSHUVHGHG E\ WKH $ GGHQGXP WR WKH+ & &8 (3 ,,

'5)216,%/0 D DQG$XJXVW '5%/0 D 7KHVHP HDVXUHVDUHWKH &RQGLWRQVRI$SSURYDOLQWKH%/0 3ODQRI2SHUDWRQV$SSURYDO0D\ ZKLFK LQFRUSRUDWHVE\UHIHUHQFH($1R 19 (DQGWKH$GGHQGXP WRWKH($1RYHP EHU ZLWKIXUWKHUGHLQHGFRQWXFWRQGHVJQDQGRSHUDWRQDOP HDVXHVIRUGULOOLQJ VXP SVDV RXWOLQHGLQWKH%DUUFNUHSRUWGDWHG'HFHP EHU

$ILU4XDOW

%DUUFN LQFRP SOLDQFHZLWKWH1'(3%XUHDXRI$ILU3ROXWRQ&RQWRO%$3&6XUIDFH '1RWXUEDQFH3HUP LWZRXOGSURWHFWDUTXDOW E\XQGHUWDNLQJURDGP DLQWHQDQFHDFWLYLWLHVWR UHGXFHIXJLWLYHGXWWP LWLRQV5RDGVZRXOGFRQWQXHWREHZDWHUXVLQJ IUHKZDWHUURUGLOO SURGXFHGJURXQGZDWHUFRQWLWWQWZLWKWH1'(3DSSURYDOJUDYHOHG RUFKHP IFDO WHDWG WR UHGXFHIXJLWLYHGXWWP LWLRQV EDVHGXSRQZHDWKHUDQGURDGFRQGLWRQV $SSOHFDWRQRI ZDWU DQGRUDGXWWXSSUHWLRQFKHP IFDOXFKDVP DJQHLXP FKORUGHE\ ZDWUWXFNVZRXOGEHGRQH DVQHHGHGLQDUHDVRI FORVHVSDFHGGULOOLQJ DQGUHDWWGDFWLW %DUUFNZRXOGXVHZHWGULOOLQJ P HWRGV6SHHGOP LWDUHSRWWG DQGYHKLFOHVSHHGVUHGXFHGLQDUHDVRI GLWXUEDQFHWR P LQLP LJHWHSRWQWDOIRUIXJLWLYHGXWWP LWLRQV WR SURWFWZLOOLHDQGOLYHWRFN DQGWR P DLQWLQRSHUDWRQDOVDIHW 6SHHGOP LWZRXOGFRQWQXHWREHQIRUFHG 3URWFWYHKLFOHVZRXOG FRQWQXHWREHP DLQWLQHGUHJXODUO WRHQXUHWKH DUHRSHUDWQJ LQDP DQQHUWRP LQLP LJH YHKLFOHHP LWLRQV

: DWU4XDOW

Spill Contingency Plan

0DWULDOVDQGHTXLSP HQWQHHHWDU IRUVSLOOFOHDQXS ZRXOGEHNHSWDWHDFKGULOOUJ (TXLSP HQW DQGP DWULDOVZRXOGLQFOXGH EXWQRWEHOP LWGWR VKRYHOV JORYHV VDHW JODVHV VRUEHQW P DWULDOV VDQG VDZGXWDQGSODWWF P HWDOWDK FRQWQHUVVSHFLIIFDO IRUWKLVSXUSRVH

: HOOP DLQWQHGHTXLSP HQWZRXOGEHXVHGWRSHUURP WKHZRUNUHTXLUHGDWWKH+&&8(3 : KHQSUDFWFEOH HTXLSP HQWP DLQWQDQFHZRXOGEHSHUURP HGRII VLW ,QWKHHYHQWRI RLO IXHO OXEUFDWQJ JUHDVH RUWKHUHTXLSP HQWWHDNV FOHDQXS ZRXOGEHFRQGXFWHGDVVRRQDVSRWWEOH ,I WKHOHDNLVRQFRP SDFWHGVRLO DQRLOEVRUEIQJ SURGXFWVXFKDV$EVRUE P D\EHDSSOHG 2QFH WKHFOHDQXS SURGXFWKDVEVRUEHGWKHVSLOOP DWULDOWKHSURGXFWVUHP RYHGDQGSODFHGLQWKH SHWUROHXP FRQWP LQDWHGVRLOEIQORFDWHGLQWKHOD\GRZQ\DUG DQGWKHP DWULDOGLVSRVHGRI DFFRUGLQJ WR WWDWH DQGIHGHUDOUHJXODWRQV $Q\ FRQWP LQDWHGVRLOZRXOGEHUHP RYHG P DQDJHG DQGGLVSRVHGRI DWDQRII VLWHIDFLOW LQFRP SOLDQFHZLWKWHDDSSOLFDEOH UHJXODWRQV

,QWHHYHQWRI RLO IXHO RUK\GUDXOF IOXLGOHDNV FOHDQXS ZRXOGEHFRQGXFWHGDVVRRQDV SRWWEOH ,QWHHYHQWRI DP DWU VSLOO WKHIRORZLQJ DFWRQVZRXOGEHWDNHQLQDGGLWRQWRDQ\ IHGHUDO WDWH DQGORFDOKHDOWKDQGVDIHW UHJXODWRQV

- &RQWDQWWHVSUHDGRUP LJUDWRQRI WKHVSLOOXVLQJ WKHRQKDQGVXSSO\RI HURVRQFRQWRO WWXFWXUHVDQGRUE\ FUHDWQJ GLWEHUP V DVIHDWEOHDQGQHFHVDU\
- 5HJXODWQGZDWWVZLOOEHUHP RYHGIURP WKH+&&8(3 DUHDDQGGLVSRVHGRI LQDWWW IHGHUDORUORFDOGHWJQDWGDUHD

- ,I D VSLOORI DSHWUROHXP FRQWDXWLV FRQWLGHUHG WR P HHWWKH UHSRUWHOHTXDQWW SHUWH 1 ' (3¶VJ XLGHOLQHV J UHDWHUWKDQ J DOORQVRUJ UHDWHUWKDQ FXEIF \ DLGVRI IP SLFWG P DWULDO RUD UHSRUWHOHTXDQWW IRUKD]DUGRXVZ DWWLVUHOHDVHGEDVHGRQWKH8 6 (QYLURQP HQWDO3 URWHFWRQ$ J HQF\ (3$ J XLGHOLQHVHWWHOHXQGHU7 LWOH,,, / LVWRI / LVW &) 5 3DUW WKH%/ 0 DQG1 ' (3 Z RXOG EHQRWLHG Z LWKLQ KRXUVDQG WKHDSSURSULDWHP HGLDOLFWRQVDQG FRQILUP DWRQ VP SOLQJ Z ILOOEH FRQGXFWHG XQGHUGLUHFWRQ RI WKH1 ' (3

Soil and Erosion Prevention and Control

%DUUFN Z RXOG FRQWXQXHWR FRQGXFWH[SORUDWRQ RSHUDWRQVWR P ILQP I]HVRLOHUVIRQ (URVIRQDQG UXQRII FRQWUROP HDVXUHV VXFK DVZ DWUEDUV GLWKLQJ DQG RWKHUZ DWUFRQWUROWWXFWXUHVZ RXOG EHIP SOHP HQWHG IQ DUHDVRI VXUFHGLWXUEDQFH $ IWUWKHH[SORUDWRQ SURJ UDP LVFRP SOHWHG IQ DQ DUHD WKHVXUFHGLWXUEDQFHZ RXOG EHJ UDGHG UHFRQWRXUHG DQG DYDLODEOHWR SVRLOJ URZ WK P HGLXP UHSODFHG DQG WKHDUHDZ RXOG EHVHHGHG Z LWK DQ DSSURSULDWHDQG %/ 0 DSSURYHG VHHG P I[WXUHIQ RUGHUWR HWWEOXK DJ URXQG FRYHUDQG P ILQP I]HHURVIRQ 5 HYHJ HWWRQ DFWWYLWHV Z RXOG FRQWXQXHWR EHFRP P HQFHG DWWKHHDUHWWHDWEOHWP HIRORZ IQJ UHFDP DWRQ DFWWYLWHV %HWW0 DQDJ HP HQW3 UDFWFHV %0 3V XWD]HG WR FRQWROHURVIRQ DQG VHGIP HQWWRQ DUHGHWWOHG IQ **$ SSHQGI[%**

Water and Riparian Resources

1 DWXUDOGUDLQDJ HSDWWHUVZ RXOG QRWEHDOWHUHG ' URORVWFRQWXFWRQZ LWKLQ GUDLQDJ HVZ RXOG EH DYRLGHG XQOHVSURUDSSURYDOIURP WKH%/ 0 DQG1 ' (3 LVREWDLQHG : KHQGUDLQDJ HVP XWWEH FURVVHG Z LWK DURDG %0 3VZ RXOG EHIRORZ HG WR P ILQP I]HWKHVXUFHGLWXUEDQFHDQG HURVIRQ SRWHQWDO 7 HP SRUDU\ FXOYHUWVDQG RUWWDY EDOHVZ RXOG EH XWD]HG WR SURWHFWGUDLQDJ HV 6P DOOHU GUDLQDJ HSDWWHUVWKDWFRXOG EHDIIHFWHG E\ WHQFK RUSDG FRQWXFWRQZ RXOG EH UHWRUHG DQG DOO FXOYHUWDQG SIS HVZ RXOG EH UHP RYHG XSRQ FRP SOHWRQ RI WKH[SORUDWRQ SURJ UDP

7 KHIRORZ IQJ FRQWXFWRQ DQG P DLQWHQDQFHSUDFWFHVIURP WKH%/ 0 * ROG %RRN 6 XUDFH 2 SHUDWQJ 6WDQGDUGVDQG* XLGHOLQHV) RXUWK(GLWRQ 5 HYLVHG Z RXOG FRQWXQXHWR EH IP SOHP HQWHG

- $ OOFXOYHUWVVKRXOG EHOLG RQ QDXUDOJ URXQG RUDWWKHRUJ IQDOHOHYDWRQ RI DQ\ GUDLQDJ H FURVVHG $ OOIXXUHFXOYHUWVVKRXOG KDYHDP IQIP XP GLP HWURI IQFKHV 7 KHRXWOHWRI DOOFXOYHUWVVKRXOG H[WHQG DWOHDWRQHIRRWEH RQ WKHWHRI DQ\ VORSH
- ' LWK JUDGHVVKRXOG EHQR OHVWKDQ SHUFHQWW SURYLGHSRVLWYHGUDLQDJ HDQG WR DYRLG VLOWDWRQ
-) RU³ GU\ EHG´ RUORZ IORZ URDG FURVWLQJ Z KIFK GR QRWUHTXLUHDFXOYHUWWKHGUDLQDJ H Z RXOG QRWEHIIOOHG VR WKDWZ DWUFDQ IORZ DFURVVWKHFURVWLQJ Z LWRXWEHQJ IP SRXQGHG

%DUUFN Z RXOG FRQWXQXHWR SOXJ DOOGUOOKROHVIQ DFFRUGDQFHZ LWK1 $ & DV DGP IQLVWHUHG E\ WKH1 ' : 5 6WDW(QJ IQHH¶V2 IIIFH %DUUFN Z RXOG FRP SO\ Z LWK WHGUOOKROH DEDQGRQP HQWSURFHGXUHV VHWRUWKIQ1 $ & WKURXJ K WR SUHYHQWFURW FRQWP IQDWRQ RI DTXLIHUVRUFRQWP IQDWRQ RI J URXQG DQG VXUIFHZ DWUV

%DUUFN Z RXOG QRW¥FRQGXFW QHZ VXUJHFHGLVXUHLQJ DFWLYLWLHVZ LWKLQ USDUDQ RUZ HQDQG DUHDV Z LWKRXWDXWKRU]DWRQ IURP %/0 DVRXWOQHG EHORZ

,I %DUUFN GHWHUPLQHVWKDWQHZ VXUJHFHGLVXUHLQJ DFWLYLWLHVZ LWKLQ USDUDQ DUHDVDUH UHTXLUHG %DUUFN Z RXOG VXEPLWWR WKH%/0 WKHORFDWRQVRI WKHSURSRVHG GULOOSDGVDQG DFFHVVURDGVLQ DQ DFFHSWDEOHIRUP DWLH HDFWRQLF VSDWDOLOHV %DUUFN Z LOOQRW¥FRQGXFWWKHSURSRVHG RSHUDWRQV XQOHVVDXWKRU]HG E\ %/0 Z KLFK P D\ UHTXLUH IXUWHUHQYLUQP HQWDODQDOVLVRURSHUDWQJ UHVWUFWRQV RUVLWH VSHFLIF (30 V ,I LWLVWKHRQ\ SUDFWLFDEOHDOWHUQDWLYH WKH%/0 P D\ DXWKRU]HVXUDFHGLVXUEDQFHZ LWKLQ USDUDQ DUHDVIL LWLVGHWHUP LQHG WKDWWKHDFWRQ DV SURSRVHG RUFRQGLWRQHG Z RXOG QRWP SDUWKHORQJ WHUP IXQFWRQ RUXWDW RI USDUDQ KDELWDW

,I %DUUFN GHWHUPLQHVWKDWQHZ VXUJHFHGLVXUEDQFHLVUHTXLUHG Z LWKLQ Z HQDQG DUHDV %DUUFN Z RXOG QRW¥FRQGXFWWKHSURSRVHG RSHUDWRQVXQOHVVDXWKRU]HG E\ %/0 $Q\ GLVXUEDQFH DXWKRU]HG Z LWKLQ Z HQDQG DUHDVZ RXOG EHLQ DFFRUGDQFHZ LWK ([HFXWLYH2UGHU (2 6SHFLIIFDOO\

6HFWRQ D ,QIXUWKHUDQFHRI 6HFWRQ E RI WKH1DWRQDO(QYLURQP HQWDO 3RODF\ $FWRI 8 6& E WKIP SURYHDQG FRRUGLQDWH) HGHUDOSODQV IXQFWRQV SURJUP VDQG UHVRXUFHVWR WKHHQG WKDWWKH1DWRQP D\ DWWDLQ WKHZ LGHVW UDQJHRI EHQHIIFLDOXVHVRI WKHHQYLUQP HQWZ LWKRXWGHJUDGDWRQ ULVN WR KHDOWK RU VDIHW HDFK DJHQF\ WR WKHH[WHQWSHUP LWWG E\ OD Z VKDOOLYRLG XQGHUWNLQJ RU SURYLGLQJ DWLWWQFHIRUQHZ FRQWXFWRQ QRFDWG LQ Z HQDQGV XQOHVV WKHKHDG RI WKH DJHQF\ IILQGV WKDWWKHUHLVSUDFWFDEOHDOWHUQDWLYH WR VXFK FRQWXFWRQ DQG WKDW WKHSURSRVHG DFWRQ LQFOXGHVDOOSUDFWFDEOHP HDVXUHVWR P LQIP I]HKDUP WR Z HQDQGV Z KLFK P D\ UHVXOWURP VXFK XVH

6HFWRQ ,QFDUULQJ RXWWKHDFWWLWHVGHVFUEHG LQ6HFWRQ RI WKLV2UGHU HDFK DJHQF\ VKDOOFRQVGHUIDFWRUVUHODWLYDQWWR DSURSRVDOVHIHFWRQWKHVXUYLYDODQG TXDOOW RI WKHZ HQDQGV $P RQJ WKHWHIDFWRUVDUH D SXEOF KHDOWK VDIHW DQG Z HOIDUH ICFOXGLQJ Z DWUVXSSO\ TXDOOW UHFKDJ HDQG GLVFKDJ H SRO0XWRQ ICRRG DQG WRUP KD]DUGV DQG VHGIP HQWDQG HURVIRQ E P DIQWQDQFHRI QDXUDOV\ WWP V ICFOXGLQJ FRQVHLYDWRQ DQG ORQJ WWP SURGXFWWLW RI H[LWWQJ ICRUD DQG IDXQD VSHFIHVDQG KDEIWWGLYHUVLW DQG WWEICOW K\ GURORJ IF XWDW IIVK Z ICOGDIH WP EHU DQG IRRG DQG IIEHUHWRXUFHV DQG F RWKHUXVHVRI Z HQDQGVIQ WKHSXEOF ICQWUHWWICFOXGLQJ UHFUHDWRQDO VFIHQWIF DQG FXOXUDOXVHV

([IWWQJ H[SORUDWRQ DQG UHFOP DWRQ DFWLYLWHVZ LWKLQ USDUDQ DUHDVZ RXOG EHDOORZ HG WR FRQWQXHSURYLGHG WKDWWKH%/0 FRQGXFWWRQ J RIQJ HYDOXDWRQVRI RSHUDWRQVWR P DNHDQ\ USDUDQ P IWW DWRQ UHFRP P HQGDWRQV

$ COH[SORUDWRQ DFWLYLWHVZ RXOG FRQWQXHWR EHFRQGXFWG XVLQJ %0 3VVXFK WKDWWHGIP HQW FXWQJ V GULOOQJ ICXIGV RUDQ\ RWKHUP DWUDORUVXEWWDFHZ RXOG QRWFQWUICRZ IQJ GUDQDJHV 6XP SVZ RXOG EHH[FDYDWG DQG P DQDJHG WR SUHYHQWRYHUWSSIQJ DQG VDXUDWQJ WKHVDHW EHUP V %DUUFN Z RXOG P RQLWRUVXP SVUHJXDOO\ IRUVHHSVRURWKHUHYGHQFHRI HURVIRQ DQG Z RXOG

GLUHFWGULOOFUHZ VWRFHDVHDFWXWLW DQG QRWW\ VXSHUYLVRUVII VHHSDJHLVREVHUYHG %DUUFN Z RXOG HQXUHWKDWXP S HYDFXDWRQ SURFHHGVIRUDVORQJ DVGULOOQJ RUWKHUZ DWUSURGXFLQJ DFWXWLWHV FRQWQXH II HYDFXDWRQ LVQRVSRWWEOH %DUUFN Z RXOG FHDVHGULOOQJ DVVRRQ DVZ DWUOHYHOV DSSURDFKWKHVXP S FDSDFLW 1 R WDVK Z RXOG EHSOHFHGLQWKHVXP SV

6RQG DQG + DJ DUGRXV: DWWW

7KH+&&8(3 Z RXOG QRWJHQHUDW XVHRUGLVSRVHRI DQ KD]DUGRXVZ DWW 3HWUROHXP SURGXFW Z RXOG EHXVHGRQ VLW 3HWROHXP SURGXFWDUHH[FXGHG DVKD]DUGRXVVXEWDQFHVXQGHUWKH &RP SUHKHQLYH(QYLURQP HQWDO5HVSRQVH &RP SHQVDWRQ DQG/ ILEILDW $FW6HFWRQ ' IHVHO RIO DQG OXEUFDQWZ RXOG EHWDQVRUWG WR WKHVLWLQ SRUWEOHFRQWLQHUV HJ WDQNVIQ WKHSIFNXS WXFNVIRUGHHOXHO EXWZ RXOG QRWEH VRUHG RQ VLW ,I UHJXDWG P DWUDOV SHWUROHXP SURGXFW DUHVSLOOHG P HDXUHVZ RXOG EH WDNHQ XQGHU%DUUFN¶VVSLOOUHVSRQVH JXLGHOLQHVWR FRQWRONHH[WWRI WKHVSLOO DQG WKHDSSURSULDWDMDJHQFLHVZ RXOG EHQRWLIHG IQ DFFRUGDQFHZ LWK WKHDSSOFDEOHIHGHUDODQG WDWXUHJXDWRQV

6RQG Z DWWZ RXOG EHFRQWFWG DWHDFK GULOOSDG DQG WDQVSRUWG RII VLWWSHUURGLFDOO IRUGLVSRVDO DWDQ DSSURYHG VRQG Z DWWI DFLOW

: ILOOQLHDQG 6HQVLWYH6SHFLHV

%DUUFN Z RXOG KDYHD%/0 TXDOLIHG EIROJLWXXLYH IQHDOO VSUIQJ RI HDFK\HDUDOOUHDV SURSRVHG IRUGULOOQJ RUVXUFHGLWXUEDQFHI IRUWKHSUHVHQFHRI DFWYHQHWW %DUUFN KDV FRP P LWWG WR FRQGXFWQJ SUHGLWXUEDQFHP LJ UDWU EILG QHWWXLYH VIQ WKHVSUIQJ DQG HWWEOWKIQJ H[FXVIRQ] RQHVDURXQG DFWYHQHWW DVSDLYRI WKHDSSOFDQWFRP P LWWG (30 V $GGLWRQDOO VXUFHGLWXUEDQFHFOHUDUFHVXLYH VZ RXOG EHFRQGXFWWG IRORRZ IQJ %/0 : ILOOQLH3URWRFROV %/0 F Z KHQ DSURSRVHG DFWYLW Z RXOG IQYROYHJ URXQG GLWXUEDQFH GXUQJ WKHQHWWQJ VHDVRQ GHIQHG E\ %/0 DV0 DUFK WKURXJK-XO : KHQ DFWYHQHWW DUH ORFDWG RUII RWKHUHYLGHQFHRI QHWWQJ LVREVHLYHG HJ P DWQJ SDLV WWUUWRUDOGHHQVH FDUVIQJ QHWWQJ P DWUDO WDQVRUWQJ IRRG %DUUFN¶VEIROJLWZ RXOG UHFRP P HQG WR WKH %/0 DQ DYRIGDQFHEXIIHUDURXQG WKHQHWWZ KIFK WKH%/0 IQFRRUGLQDWRQ Z LWK WKH1 HYDGD ' HSDUW HQWRI : ILOOQLH 1 ' 2 : DQG WKH8 6) LVK DQG: ILOOQLH6HLYIFH 8 6): 6 Z ILO UHYLHZ DQG DSSURYHSURUWR VXUFHGLWXUEDQFH %DUUFN¶VEIROJLWZ RXOG IQIRUP %DUUFN Z KHQ WKHEILGVKDYHOHVWKHQHWW%DUUFN Z RXOG QRWFRQGXFWQ GULOOQJ RUVXUFHGLWXUEIQJ DFWYLWHVZ LWKIQ WKHH[FXVIRQ] RQHXQWOWKHEIROJLWGHWWP IQHVWKDWWKHEILGVDUHQR OROQJHU QHWWQJ

(DFK\HDUGXUIQJ WKHQHWWQJ VHDVRQ 0 DUFK WR-XO %DUUFN Z RXOG QRWFRQGXFWGULOOQJ RU VXUFHGLWXUEIQJ DFWYLWHVZ LWKIQ D P IOHUDGLXVRI DQ DFWYHUDSWRUQHWW $ FWYHUDSWRU QHWW DUHUHSRUWG DQQXDOO WR WKH%/0

6SHHG OP LWDUHSRWG DQG YHKIFOHVSHHGVUHGXFHG IQ DUHDVRI GLWXUEDQFHWR P IQIP I]HWKH SRWQWDOIRUIXJ LWYHGXWWP LWIRQV WR SURWFWZ IOOQLHDQG OYHWRFN DQG WR P DIQWIQ RSHUDWRQDOVLHW 6SHHG OP LWZ RXOG FRQWQXHWR EHHQ IRUFHG

Greater Sage-grouse

%DUUFNZRXOGDGKHUHWR(30 VDVHWWHEDVKHGE\ WKH%/0 IRUJUHDWXUVDJHJURXVHOHN VWXWQJ JURXQGVDQGIRUNQRZQQHWWQJ DQGEURRGUHDULQJ DUHDV 1RLVHJHQHUDWHGE\ H[SORUDWRQ DFWWLWLHVZRXOGQRWQFUHDVHDP EHQVOHYHOVE\ $ZHJKWGGHFIEHDV G%$ DWDFWWHOHNV EDVHGXSRQ%/0 VWXSXODWRQV %/0 F 7KH(30 LVDSSOHFDEOHWR SRWQWDOO) DIIHFWHG DFWWHOHNVZLWKQIRXUP LOHVRI WKH+&&8(3 ZKIFKFXUHQWO) LQFOXGHWKH+RUVH&UHHN /HN DQGWKH1HZ &RUWH ±*UDW9DOOH\ /HN 7KH1HZ %URFN&DQ\RQ/HNLVH[FOXGHGIURP WKH (30 GXHWRWWSRJUDSKIFDOIHDWXUHVZKIFKUHGXFHRUHOP IQDWQRLVHJHQHUDWHGIURP WKH 3URSRVHG$FWRQ7KH(30 LVVXEMHFWWRUHYLHZ E\ D%/0 EIRORJLWWDQGP D\ EHIDGXVWHGEDVHG RQDQQXDOVXUYH\VRI OHN DFWWLW 8SRQIGHQW\IQJ DQ\ SUHYRXV) XQNQRZQJ UHDWXUVDJHJURXVH OHN VWXWQJ JURXQGVRUQHWWQJ RUEURRGUHDULQJ DUHDV %DUUFNZRXOGIP P HGLDWH) QRW\ WKH %/0

7RSUHYHQWHIHFWVDWOHNVIURP SRWQWDOIQFUHDVHVIQQRLVH %DUUFNZRXOGIP SOHP HQWRXQG UHGXFWRQP HDXUHVZKIFKP D\ IQFOXGHVRXQGP RGHOQJ DVSHU%/0 SURWFRO %/0 F SOHFHP HQWRI DVRXQGEDUUHUWXUOUJ V RUUHWWFWRQRI GUOQJ RSHUDWRQVGXUQJ VHDVRQDOOQG GDLV WP IQJ SHUGV ,I WKHVRXQGP RGHOQJ VKRZVQR SURWHFWQGIQFUHDVHIQQRLVHOHYHOVDERYH G%$ QR DGGLWRQDOP HDXUHVDUHQHHGG ,I WKHVRXQGP RGHOQJ VKRZVDQIQFUHDVHIQQRLVH OHYHOVDERYH G%$ RUII QR P RGHOQJ IVFRQGXFWG %DUUFNZRXOGIQWWWOVRXQGEDUUHUV ONH) KD\ EDOHVRUVP IOLUP DWUDO DWWKHGUOQJ RUZRXOGDGKHUHWR VHDVRQDOOQG WP H RSHUDWRQDOHWWFWRQV 7KHUHWWFWRQVZRXOGEHIQSOHFHIURP 0DUFK WKURXJK0D\ IURP DP WR DP %/0 F

%/0 DFNQRZOHGJHGWKDWD+&&8(3 VSHFLIF JUHDWXUVDJHJURXVHP DS ZKIFKRXWQHV 3UHOP IQDU\ 3URUUW+DEIWW33+ DQG3UHOP IQDU\ *HQHUDO+DEIWW3*+ ZDVGHYHORSHG EDVHGRQYHJHWWRQVXUYH\VGRQHE\ (6&2 $VWRFIDWW (6&2 (6&2 D(6&2 E %DVHGRQUHFHQW HYDGD%/0 JXLGDQFHSURYLGHGIQ,QWXFWRQ0HP RUDQGXP ,0 19 %/0 WKH%/0 KDVDGRSWG WKHIRORZIQJ QHZ JUHDWXUVDJHJURXVHKDEIWW FDWJRUHVEDVHGRQ8 6 *HROJIFDO6XUYH\ 86*6 P DSSIQJ E\ &RDWWVHWDO +IJK HTXLYDOHQWWR WKHSUHYRXV33+ GHMJQDWRQ 0RGHUDW HTXLYDOHQWWR WKHSUHYRXV3*+ GHMJQDWRQ /RZ DQG1RQKDEIWW%DUUFNZRXOGSURYLGHDZRUNSODQIRUIXWXUHVXUDFH GLWXUEDQFHORFDWRQVWR WKH%/0 %/0 P D\ FRQGXFWIHOG YHUIIFDWRQRI JUHDWXUVDJHJURXVH KDEIWWQDUHDVRI SURSRVHG VXUDFHGLWXUEDQFHWR IXUWHUGHIQHJUHDWXUVDJHJURXVHKDEIWW IP SDFW

,QRUGHUWR UHGXFHIP SDFWGXHWR GLWXUEDQFHZ IWQJ JUHDWXUVDJHJURXVHKDEIWW%DUUFNZRXOG SURYLGHRQHRUP RUHRI WKHIRORZIQJ (30 VIQFRRUGLQDWRQZ IWK WKH%/0

- 3IQ\RQ MXQLSHUUHP RYDO
- ,QWWOOJUHDWXUVDJHJURXVHIQJKWGHWUHQW
- ([FORVXUHVVXUURXQGLQJ VSUQJV P HDGRZ V DQG USDUDQ DUHDV
- 3D\P HQWRUJUHDWXUVDJHJURXVHP IWW DWRQ DVRXWQHGEHORZ

%DUUFNZRXOGIP SOHP HQWWKH(30 VZLWKQWZR\HDUVRI WKH'5 IRUWKH3DQ0RGLIFDWRQDQG $GGHQGXP DQH[WHQVLRQRI WKHWP HUP HIRUIP SOHP HQWQJ WKH(30 VP D\ EHDXWKRU]HGE\ %/0)RUWKH3URSRVHG$FWRQRI WKHDGGLWRQDO DFUHVRI VXUFHGLWXUEDQFH %DUUFN ZRXOGIP SOHP HQWWKH(30 VIRUWKHVXUFHGLWXUEDQFHDFUHVSURSRVHGIRUWKDW HD¶VZRUNSODQ ZLWKQWZR\HDUVRI WKHVXEP LWWORI WKHZRUNSODQ DQH[WHQVLRQRI WKHWP HUP HIRU IP SOHP HQWQJ WKH(30 VP D\ EHDXWKRU]HGE\ WKH%/0 *UHDWUVDJHJURXVH(30 VFRP SOHWHG ZRXOGEHUHSRUWHGIQWKHDQQXDOGLWXUEDQFHVXP P DU\ UHSRUWZKIFKLVSURYLGHGWRWKH%/0 DQG 1'(3E\ $SULO

8VHRI KDQG WKLQQLQJ P HWKRGV LH FKDLQVDZ OPS DQG VFDWWHUI VDDVK HW WXUHP RYHSIQ\RQ DQG MXQLSHUWHHVIQDUHDVWKDWDUHGHWHUP IQHGWXEHDFWXHO HQFURDFKIQJ IQWJ UHDWUVDJHJURXVH KDEIWWZRXOGEHIP SOHP HQWG 3IQ\RQ MXQLSHUZRXOGEHUHP RYHGIURP WKUHHDFUHVRI HQFURDFKP HQWUHDVIRUHYHU RQHDFUHRI SURSRVHG SURMHFWGLWXUEDQFH 3IQ\RQ MXQLSHU WHDW HQWZRXOGEHSURUWHG WRRFFXUZ LWKQWKH+&&8(3 ERXQGDU\ DQGIRFXVRQ3KDVH, DQG3KDVH,, SIQ\RQ MXQLSHUFRQGLWRQV 7UHDW HQWZFWXWLWHVZRXOGQRWRFFXUZ LWKQDIRXUP IQH EXIHUIURP DFWXHOHNVIURP 0DUFK WKURXJK-XQH WR P IQIP I]HWKHSRWQWDOIRUIP SDFWVWR EUHGIQJ DQGQHWWQJ JUHDWUVDJHJURXVH 6XUYH\VIRUP IJ UDWU EIUGVZRXOGEHUHTXLUHG EHWHHQ0DUFK DQG-XO\

7RP IQIP I]HSRWQWDOIP SDFWVWRFXOXUDOUHVRXUFHVDVDUHXOWRI WKHHHP HDXUHV VHYHUDO DGGLWRQDODFWRQVZRXOGEHXQGHUWDNHQ $VVSHFLIF WHDW HQWWWVDUHIGHQWIHG D%/0 WXWI DUFKDHRQRJ LWZRXOGHYDOXDWWKHSRWQWDORI WKHDUHDIRUFXOXUDOUHVRXUFHV DQGZRXOG XQGHUWNHDYRIGDQFHP HDXUHVDVQHHGHG 7RUHGXFHWKHULVN RI XQDXWKRU]HGFRQHFWRQ IIHOG FUHZVZRXOGEHIQWXFWG E\ DQDJHQF\ DUFKDHRQRJ LWWHJ DGIQJ WKHIP SRUWQFHRI FXOXUDO UHVRXUFHVDQG WKHSRWWEOHSHQDWWHVXQGHUWKH$UFKDHRQRJ IFDO5HVRXUFHV3URWFWRQ$FWRUWKH GHWXFWRQRI DUFKDHRQRJ IFDOUHVRXUFHV ,QRUGHUWR GHFUHDVHWKHULVN RI IQDGYHUWQWGP DJ HWR IUDJ IQHUP DIQV FUHZVZRXOGDOR EHIQWXFWG WR UHFRJ QI]HZRRG DQG EUXVKFXOXUDOUHVRXUFHV

*UHDWUVDJHJURXVHIQJKWGHWUHQW IHQFHP DUNHUV ZRXOGEHDWWFKHG WR IHQFHVZ LWKQJ UHDWU VDJHJURXVHKDEIWWWDWD%/0 GHWUP IQHG UDWR RI QXP EHUR GHWUHQWIRUHYHU DFUHRI GLWXUEDQFH 3UHHUHG ORFDWRQVRI IQJKWGHWUHQWIQFOXGHIHQFIQJ QHDUOHNVDQG DWRFIDWG EXIHUDUHDV

(\[FORVXUHVZRXOGEHFRQWXFWG VXUURXQGIQJ VSUIQJV P HDGRZV DQG USDUDQ DUHDVIGHQWIHG E\ %/0 DVIP SRUWQWJ UHDWUVDJHJURXVHKDEIWW

$VRXWIQHGIQWKH0HP RUDQGXP RI8QGHUWWQGIQJ 0 2 8 *Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat* %/0 HWDO SD\P HQWP D\ EHP DGHIQWX DJ UHDWUVDJHJURXVH P IWJ DWRQ EDQN DFFRXQWRUWKHUSURJ UP IQ DQ DP RXQWHTXDOWX WKHFRWWRI VDWW\IQJ WKHWUJ HW P IWJ DWRQ UDWRV &RWWIRUP DNIQJ VXFKIP SURYHP HQWVRQ SUYDWWDQGVZRXOGEHEDVHGRQ WKH 1HYDGD6WQGDG]HG5HFOP DWRQ&RW(WWP DWU 65&(P RGHO 7KH1HYDGD65&(ZRXOG DOR SURYLGHWKHEDVLVIRUQHJRWDWQJ FRWWIRUSXEOF OQGVIQFOXGIQJ FRWWRI 1(3$ FRP SODQFH %/0 HWDO

:KHUHUHFOODPHGDUHDVDUHIRXQGWRDGHTXDWHOB DGGUHVVVRPHRUDOORI WKHIP SDFWWRJUHDWU VDJHJURXVHKDEWDWWKHUHTXLUHGKDEWDWP SURYHP HQWDFUHDJHP D\ EHUHGXFHGRUFUHGLWGRQD RQHDFUHWRRQHDFUHUDWRDVGHWUP IQHGE\ WKH%/0 %/0 HWDO

Bats

%DUUIFNZRXOGQRWFRQGXFWXUDFHGLWXUEIQJ DFWWLWHVZ LWKQ IHHWRI H[LWWQJ DGLW VKDW RSHQIQJV RUFDYHVWR SUHYHQWDQ\ IP SDFWWREDWSHFLHVSRWQWDOO UHVGLQJ IQRUQHDUWKHVH WWXFWXUHV ,I D%/0 TXDOLIHGEIRORJLWWXUYH VWKHVLWDQGGHWUP IQHVWKDWEDWDUHQRWUHVGLQJ IQRUQHDUWKHWWXFWXUH WKHDIRUHP HQWRQHGH[FXVIRQ]RQHZRXOGQRWDSSO\

Pygmy Rabbit

%DUUIFNZRXOGQRWFRQGXFWXUDFHGLWXUEIQJ DFWWLWHVZ LWKQ KDEWDWGHQWIHGDVVXLWEOHWR VXSSRUWS\JP\ UDEEEIW*Brachylagus idahoensis* XQWDDSUHGLWXUEDQFHVXUYH KDVEHHQ FRQGXFWWG ,I DFWWYHEXURZVDUHIGHQWIHG%DUUIFNZRXOGQRW\ WKH%/0 WR HYDOXDWWKH SRWQWDOIP SDFWDQG FRRUGLQDWZ LWK%DUUIFN WR GHYLVHDQ IP SOPP HQWP HDXUHVWR P IQIP I]H IP SDFWWR WKHS\JP\ UDEEIWDQG LWKDEWDW7KHVHP HDXUHVP D\ IQFOXGHDYRIGDQFH

Other Special Status Species

,QWHHYHQWWKDWRWKHUVSHFLDOWDXVSOOQWRUDQIP DOVSHFLHVDUHIGHQWIHGZ LWKQ WKH+&&8(3 %DUUIFNZRXOGQRWFRQGXFWXUDFHGLWXUEIQJ DFWWLWHVZ LWKQ WKHVSHFLHV KDEWDWXQWOWKH%/0 FDQHYDOXDWWKHSRWQWDOIP SDFWDQG FRRUGLQDWZ LWK%DUUIFN WR GHYLVHDQ IP SOPP HQWDSOOQ WR DYRIG WKHKDEWDW

5RDGV

5RDG FRQWXFWRQ DQG GUDQDJHRSHUDWRQVDUHJRYHQHGE\ WKHSURYLVRQVRI WKH+&&8(3 3QDQ DQG WKH6WDWRI1HYDGD* HQHUDO6WRUP Z DWU3HUP IWI 9 5 0 6: DSSURYHG 0DUFK 5RDGVZRXOGEHGHMJQHG WR WKHP IQIP XP WWQGDGVQHHGHG WR DFFRP P RGDW IQWQGHG VDHXVHDQ WR P DIQWQ VXUDFHUHRXUFHSURWFWRQ : KHUHHDWEOH H[SORUDWRQURDGV Z RXOGEHFRQWXFWG DORQJ H[LWWQJ FRQRXUV ([SORUDWRQURDG FRQWXFWRQ Z RXOGEH FRQGXFWG IQ VXFK DP DQHUDV WR P IQIP I]HFXWDQG IIOOV IQFOXGIQJ OP LWQJ URDG FRQWXFWRQ RQ WWHS VOPSHV Z KHUHSRWWEOH

/LYHWRFN DQG5DQJH$QDOW HQW

%DUUIFNZRXOGSURWFWHQFHV JDWV WRFNSRQGV DQG RWKHUUDQJHIP SURYHP HQWZ LWKQ WKH +&&8(3 *DWVZRXOGEHFORVHG DQG RUORFNHG DVDSSURSUDWW $QU UDQJHP RQWRUQJ NH\ DUHDVIQ WKH+&&8(3 DUHDZRXOGEHDYRIGHG

&XOXUDO5HVRXUFHV

%DUUIFNZRXOGFRQWXHWR FRQGXFWH[SORUDWRQ DFWWLWHVIQ DFFRUGDQFHZ LWK DOOSSOOFDEOH WWW DQG IHGHUDOUHJXODWRQVDQG WKH 3URJUUP P DWF $JUHHP HQW3$ DP RQJ %/0 WKH6WDW +LWRUF3UHVHUYDWRQ2IIIFH 6+32 DQG%DUUIFN %HRUHFRQGXFWWQJ DQ\ VXUDFHGLWXUEIQJ DFWWLWHV %DUUIFNZRXOGVXEP LWWR WKH%/0 D VFDOHP DS VKRZ IQJ WKHORFDWRQ RI SURSRVHG DFWWLW) RUDUHDVWKDWSUHYRXVO\ KDYHEHHQ VXUYH HG DWWKH&&DW,,, OHYHO%/0

Z RXOG VWHQ GHWDLP ICHZ KIFK FXOXUDOVLWVVQHG WR EHP RQLWRUHG DQG HVWDEOLVK DQ H[FOXVLRQ]RQH DURXQG HDFK VLWHOJ IEOHIRUWKH1 DWRQDO5 HJ LVWURI + LVWRUF 3 QDFHV 1 5 + 3

) RUDUHDVWKDWKDYHQRWEHHQ VXUYH HG DWD&QDW,,, QHYHO %/ 0 Z RXOG GHWDLP ICHWKH$ UHDRI 3 RWQWDO(IIHFWDQG Z KHWKHUD&QDW,,, VXUYH LVQHFHVDU ,I D&QDW,,, VXUYH LVUHTXLUHG %DUUFN Z RXOG UHWDLQ D%/ 0 TXDOLIHG DUFKDHRORJ LVWWR XQGHUWNHWKHIQYHQWRU %DUUFN Z RXOG VHOHFWD1 DWYH$ P HUFDQ REVHLYHUIURP DQDWWRI SUHYIRXV) XVHG REVHLYHLVWR DFFRP SDQ WKH DUFKDHRORJ LWGXULQJ WKHIQYHQWRU WR SURYLGHIQIRUP DWRQ DQG RUHFRP P HQGDWRQVWR WKH%/ 0 ,I WKHVHOHFWG1 DWYH$ P HUFDQ REVHLYHULVQRWDYDLODEOHXSRQ ILYHGD V¶QRWFH DGIIHUHQW REVHLYHUP D EHVHOHFWG ,I QRQHIVDYDLODEOHZ IWKQ DUHDRQ EOHSHURG %DUUFN Z RXOG GRFXP HQWWKDWDUHDRQ EOHDWWP SWZ DVP DGHWR FRQWFWWKH7 UEHVDQ REWWQ DQ REVHLYHU $ UHYLVHG3$ EHWHHQ %DUUFN %/ 0 6+32 DQG7 UEDOHQWWHVLVFXUHQW XQGHUGHYHORSP HQW Z KIFK P D UHXOWQ DQ XSGDWG1 DWYH$ P HUFDQ REVHLYHUSURFHVV

7 KHDUFKDHRORJ LWZ RXOG VXEP IWD UHSRUWWKDWDGKHUHVWR WKH%/ 0 V&XOXUDO5 HVRXUFH, QYHQWRU * XLGHOQHVGRFXP HQWQJ WKHUHXOWVRI WKHIQYHQWRU $ OOGRFXP HQWG VWWZ RXOG EHSURWFWG IURP VXUFHGLWXUEIQJ DFWYLWHVE\ DQH[FOXVLRQ]RQHGHWP IQHG E\ D%/ 0 DUFKDHRORJ LWW XQWWKH%/ 0 DWHWWHVZ KHWKHUWKHVLWHVLVHDJ IEOHIRUDWWQJ RQ WKH1 5 + 3 ,I WKH%/ 0 GHWP IQHV IQ FRQXXOWWRQ Z IWK6 + 32 WKDWXFK VLWHVRUP D EHHDJ IEOHIRUWKH1 5 + 3 %DUUFN Z RXOG QRWFRQGXFWDQ VXUFHGLWXUEIQJ DFWYLWHVZ IWKQ WKHH[FOXVLRQ]RQHZ IWRXW IXUWHUDXWRU]DWRQ IURP %/ 0 Z KIFK P D UHTXLUHIXUWHUHQYLURQP HQWDODQ RUFXOXUDO DQD)VHV ,I WKHVLWHVIVGHWP IQHG QRWWR EHHDJ IEOH RU%/ 0 GHWP IQHVWKDWW[IWWQJ FXOXUDO VXUYH VDUHVXIIFIHQWWR FRQFXGHWKDWQR HDJ IEOHVIWVH[IWW%DUUFN P D FRQGXFWXUDFH GIWXUEIQJ DFWYLWHVXSRQ QRWIFDWRQ E\ WKH%/ 0

,I %DUUFN GIVFRYHLVSUHYIRXV) XQNQRZ QFXOXUDOUHVRXUFHVZ KIOHXQGHUWNIQJ H[SORUDWRQ DFWYLWHV %DUUFN Z RXOG IP P HGLDW) FHDHDQ VXUDFHGLWXUEIQJ DFWYLW Z IWKQ P HWVV IHHWRI WKHGIVFRYHU DQG QRWW\ WKH%/ 0 ,I WKH%/ 0 GHWP IQHV IQ FRQXXOWWRQ Z IWK6 + 32 WKDWWKHVIWHVRUP D EHHDJ IEOHIRUWKH1 5 + 3 D%/ 0 DUFKDHRORJ LWW Z RXOG GHWP IQHDQ H[FOXVLRQ]RQHDGHTXDWWR SURWFWWKHUHVRXUFH %DUUFN Z RXOG QRWFRQGXFWDQ VXUDFHGLWXUEIQJ DFWYLWHVZ IWKQ WKIVH[FOXVLRQ]RQHZ IWRXW IXUWHUDXWRU]DWRQ IURP WKH %/ 0 Z KIFK P D UHTXLUHIXUWHUHQYLURQP HQWDODQ RUFXOXUDODQD)VHV ,I WKHVIWHV GHWP IQHG QRWWR EHHDJ IEOH %DUUFN P D UHVXP HVXUDFHGLWXUEIQJ DFWYLWHVXSRQ QRWIFDWRQ E\ WKH%/ 0

%DUUFNVHP SOR\HHVDQ FRQWFWRUVZ RXOG UHFHLYH WDLQIQJ RQ WKHSRWQWDOIRUFXOXUDO UHVRXUFHVDQ WKHSURFHGXUHVUHTXLUHG E\ %DUUFN WR DYRID GIVXUEIQJ DOWUIQJ RUGHVWR\IQJ DQ UHP DIQVRUDQ KIWRUFDORUDUFKDHRORJ IFDOVLW VWXFXUH EXIOGIQJ RUREMFWRQ IHGHUDOODQG ,I H[SORUDWRQ DFWYLWHVXQFRYHUKXP DQ UHP DIQV %DUUFN Z RXOG IP P HGLDW) FHDHDOHDWK GIVXUEIQJ DFWYLWHVZ IWKQ P HWVV IHHWRI WKHGIVFRYHU DQG QRWW\ WKH%/ 0 DQG FRXQW OOZ HQIRUFHP HQWWR WKDW%/ 0 DQG RUOOZ HQIRUFHP HQWFDQ HQXUHFRP SOODQFHZ IWK DOO DSSOIFDEOHOOZ VUHJ DUGIQJ VXFK GIVFRYHU

,I %DUUFN GLVFRYHUV D YHUVLRQ LV DYDLODEOH IRU WKH GHSRVLWRU XQGHUOLQJ VXUFDFH GLVXUEDQFH %DUUFN Z RXOG LP P HGLDWHOB FHDVH LXUWKHUDFWLYLWLHV WKDW P D\ DIIHFW WKH GHSRVLWDQG QRW\ WKH%/ 0 VR WKDWWKH%/ 0 P D\ HYDOXDWH WKH GLVFRYHU\ DQG HVWDEOLVK DQ H[FXVLRQ]RQH %DUUFN Z RXOG QRW XQGHUWDNH DQ\ IXUWKHU VXUFDFH GLVXUEDQFHZ LWKLQ WKH H[FXVLRQ]RQH

1 DWXUH$ P HUIFDQ 5 HVRXUFHV DQG &RQFHUQV

$ IWHUP RUHWKDQ \ HDUV RI HXQRJ UDSKIF Z RUN DQG FRQXOWDWRQ LQ WKH&UHVFHQW 9 DOOH &RUW] * UDW9 DOOH 3LQH9 DOOH DUHDV Z KIFK LQFOXGHG LQWXYHZ VZ LWK NQRZ OHGJ HDEOH LQGLYLGXDOVDQG JURXSV FRP SLODWRQVRI HXQRJ UDSKIF UHVHDUFK IIHOG WRXUV DQG IRUP DO JRYHUQP HQWXR JRYHUQP HQWFRQXOWDWRQVZ LWK IHGHUDO UHFRJ QL]HG 1 DWXH$ P HUIFDQ WUEHVLQ WKH DUHD %/ 0 GHWUP LQHG WKDW0 RXQW7 HQDER: KLW&OLIVDQG SRUWRQVRI + RUVH&DQ RQ DUH HDJ IEOHIRUDWWQJ RQ WKH1 5 + 3 DV3 URSHUWLHVRI &XOXUDODQG5 HDJ IRXV,P SRUWQFH 3&5 ,

%HRUHFRQGXFWQJ DQ DFWXLW LQ WKH3&5 , DUHDV %DUUFN Z RXOG QRW\ WKH%/ 0 RI WKH SURSRVHG DFWXLW VR WKDWWKH%/ 0 P D\ HVWDEOLVK H[FXVLRQ]RQHVDVQHFHVDU\ WR SURWHFWWKH IHDXUHVLGHQWLHG DVFRQWUEXWQJ HOPP HQWLQ WKH$ SULO HDJ IEIOW GHWUP LQDWRQVIRU WKH3&5 , DUHDV %DUUFN Z RXOG QRWFRQGXFWDQ DFWXLW Z LWKLQ VXFK H[FXVLRQ]RQHVZ LWKRXW IXUWKHUDXWKRU]DWRQ IURP WKH%/ 0 Z KIFK P D\ UHTXLUHIXUWKHUHQYLURQP HQWDODQG RUFXOWXUDO DQDOVHV) RUDQ DFWXLW FRQGXFWG LQMGHWKH3&5 , DUHDV EXWRXWLGHRI WKH H[FXVLRQ]RQHV %DUUFN Z RXOG DUUDQJ HIRUD%/ 0 TXDOLIHG DUFKDHRORJ LWDQG D1 DWXH$ P HUIFDQ REVHUYHU DV SURYLGHG DERYHIQ 6HFWRQ WR EHRQ VLWGXUQJ QHZ VXUFDFH GLVXUEDQFH DFWXLW WR HQVXUH WKDWFRQXEXWQJ HOPP HQWDUHQRWDGYHUVHOB DIIHFWG E\ WKHRSHUDWRQV

6XUYH 0 RQXP HQW

6XUYH P RQXP HQW Z LWQHVFRUQHLV DQG RUUHHUHQFHP RQXP HQWZ RXOG EHSURWFWG WR WKH H[WHQWFRQRP IFDO0 DQG WFKQIFDO0 IHDWEOH 6KRXOG P RYLQJ VXFK DIHDXUHEHUHTXLUHG %DUUFN Z RXOG HQVXUHWKDWDOOFHQWG 3URIHVVRQDO/ DQG 6XUYH RUYHUVHHDQG H[HFXWWKHUHRFDWRQ IQ D P DQQHUFRQVLWWQWZ LWK DSSOFDEOHOZ V 7 KH%/ 0 Z RXOG EHQRWIHG IQ Z UWQJ SUIRUWR WKH P RYLQJ RI DQ\ VXFK VXUYH\ P RQXP HQW

) ILH3 UHYHQWRQ DQG &RQWURO

%DUUFN Z RXOG FRP SO\ Z LWK DOOLSSOFDEOHIHGHUDODQG WDWWIILUHOZ VDQG UHJ XDWRQV DQG Z RXOG WDNHDOUHDVRQEOHP HDVXUHVWR SUHYHQWDQG VXSSUHWVIILUHVIQ WKHDUHDRI RSHUDWRQV %DUUFN DQG FRQWDFWRUVDUHUHTXLUHG WR FDU\ IILUHH[WQJ XLVKHUV KDQG WRROV DQG RUEDFNSDFN WSHZ DWU SXP SVIQ WKHUYHKIFOHV WR VXSSUHVVVP DOOIILUHV

1 R[IRXV: HHGV , QYDVLYH DQG 1 RQ QDWXH6 SHFIHV

%DUUFN Z RXOG EHUHVSRQVLEOHIRUFRQWRQOQJ DOOQR[IRXVZ HHGVIQ QHZ O\ GLVXUEHG DUHDVXQWO WKHUHFOP DWRQ DFWXLWHVKDYHEHQ GHWUP LQHG WR EH VXFFHVVIXODQ UHOHDVHG E\ WKH%/ 0 $ XWKRU]HG2 IIIFHU

$ QR[IRXVZ HHGP DQDJHP HQW SODQ KDVEHQ SUHSDUHG IRU+ & &8 (3 (6&2 **$ SSHQGL[*** 7 KHSXUSRVHRI WKHSODQ LV WR SUHYHQWP LWJ DW DQ FRQWROWHVSUHDG RI QR[IRXVZ HHGV GXLQJ DQG IRORZ IQJ H[SORUDWRQ 7 KHSODQ SUHVFUEHVDFRQWROSURWFRORXLQJ GLVXUEDQFH

FDWHJ RULHV DQG EHWWHU SSOLFDEOHI FRQWROP HWKRGV IRU HI HFWLYHQHVV ' LVWXUEDQFHI FDWHJ RULHV DUH DSSOLHG WR DUHDV RI + & &8 (3 EDVHG RQ IUHTXHQF\ RI GLVWXUEDQFH 7 KHSOLDQ DOR LQFOXGHV DOLVW RI ILYHZ HHG FRQWROD0WLQDWLYHP HWKRGV LQFOXGLQJ P DQXDO FKHP ICDO DQG VHHGLQJ RI GHMLUDEOHI VSHFLHVP HWKRGV Z KIFK DUHDSSOLHG WR HDFK GLVWXUEDQFHI FDWHJ RU\

%DUUFN Z RXOG IRORZ WKHQR[IRXVZ HHG P DQDJ HP HQWSOLQ (6&2 $ VSLDWRI Z HHG FRQWROP HDVXUHV %DUUFN Z RXOG UHTXLUH WKDWWKHXQGHUFDUUDJ HRI DOOFRQWDFWRUYHKIFOHVEH FOHDQHG SUIRUWR HQWHULQJ WKH+ & &8 (3 DUHDIL WKHYHKIFOHILVFRP IQJ IURP DQ DUHDRXWLGHRI QRUWKHDWHLQ 1 HYDGD $ OLWRI 6WDWHRI 1 HYDGDZ HHGVFDQ EHIRXQG DWWKH6 WDWHRI 1 HYDGD ' HSDUW HQWRI $ J UIFXOXUHZ HEVLW KWS DJ UIQY J RY 3DQWL R[IRXVB: HHGV

2 QV FKHP IFDOVDSSUROYHG IRUXVHRQ SXEOIF ODQG Z RXOG EHXVHG IRUIQYDVLYH QRQ QDWXVHZ HHG WHDW HQW %DUUFN Z RXOG FRQGXFWZ HHG HUDGIFDWRQ SURJ UP VDQQXDO IQ DUHDVRI WKHU DFWXWHV $ UHDVRI NQRZ QQR[IRXVZ HHGV IQYDVLYH DQG QRQ QDWXVHVSHFIHVZ RXOG EHDYRIGHG GXUIQJ SHUIRGVZ KHQZ HHGVFRXOG EHVSUHDG E\ YHKIFOHV LH SHUIRGVRI SRWQWDOVHG GLVSHUVDO

7 KHXVHRI VXLWEOHVHG P I[HVZ IWK RQV FHUWIHG DQG WWWWG VHHG FRP EIQHG Z IWK IP SOHP HQWWRQ RI SURP SWDQG DSSURSUIDWUHYHJ HWWRQ WFKQIXHV Z RXOG UHGXFH WKHSRWQWDO IRUIQYDVLYH QRQ QDWXVHZ HHG IQYDVRQ 7 KH%0 3 VRI DFWXHV WHDWQJ IQYDVLYH QRQ QDWXVH Z HHGVXSRQ GLVFRYHU Z RXOG DOR SUHYHQWWKHVHZ HHG VSHFIHVIURP VSUHDGIQJ DQG GRP IQDWQJ WKHVLW 5 H HWXE0DKP HQWRI YHJ HWXRQ IQ GLWXUEDQFHI DUHVZ RXOG EHFRQGXFWWG DV VRRQ DV SUDFWFDOWR UHGXFH WKHSRWQWDOIRUZ IQG DQG Z DWUHURVIRQ P IQIP I] HIP SDFWVWK VRIOYDQG YHJ HWXRQ DQG KHS SUHYHQWWKHVSUHDG RI QR[IRXVZ HHGV IQYDVLYH DQG QRQ QDWXVHVSHFIHV

5 HFOIP HG DUHDVZ RXOG EHVHGHG Z IWK %/ 0 DSSURYHG UHFRP P HQGDWRQVIRUVHG P I[DSSOIFDWRQ UDWV DQG VHHGIQJ P HWKRGV 7 KH%0 3 VRI DFWXHV WHDWQJ QR[IRXVZ HHGV IQYDVLYH DQG QRQ QDWXVHVSHFIHVXSRQ GLVFRYHU Z RXOG DOR SUHYHQWWKHVHZ HHG VSHFIHVIURP VSUHDGIQJ DQG GRP IQDWQJ WKHVLW &RP SOLDQFHZ IWK WKHQR[IRXVZ HHG P DQDJ HP HQWSOLQ (6&2 Z RXOG IQVXUHH[SORUDWRQ DFWXWHVIRORZ SURSHU%/ 0 SURWRFROUHJ DUGIQJ QR[IRXVZ HHGV IQYDVLYH DQG QRQ QDWXVHVSHFIHV

) RUHWXW DQG: RRGDQG 5 HWRXUFHV

%DUUFN Z RXOG P IQIP I] HZ KHUHSRWWEOHDQ IQXU RUUHP RYDORI SIQ RQ SIQH NXQLSHU DVSHQ OP EHUSIQH RUP RXQWQ P DKRJ DQ GXUIQJ DFWXWHVDVWRFIDWG Z IWK GUOOSDG DQG URDG FRQWXFWRQ + RZ HYHU SIQ RQ SIQHDQG NXQLSHUWKDWKDVEHHQ UHP RYHG GXHWR H[SORUDWRQ DFWXWHVZ RXOG EHP DGHDYDIOLEOHIWR WKHSXEOIF

9 IVXDO5 HWRXUFHV

7 R P IQIP I] HHIHFWIURP OJ KWQJ %DUUFN Z RXOG XWD] HKRRGHG WWWRQDU OJ KWVDQG OJ KW SOQQW / IJ KWQJ Z RXOG EHGIUHFWG RQWR WKHSHUWQHQWWWRQ DQG DZ D\ IURP DGNFHQWDUHDV QRWQ XVHZ IWK VDHW DQG SURSHUOJ KWQJ RI WKHDFWYHZ RUN DUHDVEHQJ WKHSUP DU J RDO / IJ KWQJ II[VXUHVZ RXOG EHKRRGHG DQG VKHOHG DVDSSURSUIDW %DUUFN Z RXOG XWD] HOJ KWQJ GHMJ QHG WR UHGXFH WKHIP SDFWWR QJ KWNHV

(P SOR\ HH7 UDLQLQJ

%DUUIFN Z RXOG WDLQ HP SOR\ HHV FRQWUDFWRUV DQG RWKHUUHODWHG SHUVRQQHODVWKWHHQYLURQP HQWDO DQG FXOXUDOUHVRXUFHVUHSRQVLEOHWHVUHTXLUHG XQGHUWKLV+ & &8 (3 3DQ DVZ HOODVDSSOLFDEOH VWDWH DQG IHGHUDOODZ

5 HFODP DWRQ

5 HFODP DWRQ RI GLVXUEHG DUHDVUHXQWQJ IURP DFWLYLWHVRXWLQHG LQ WKH+ & &8 (3 3DQ Z RXOG EHFRP SOHWHG LQ DFFRUGDQFHZ LWK %/ 0 DQG 1 ' (3 UHJXODWRQVDQG UHTXLUH HQW %DUUIFN Z RXOG SUHSDUHD' RFXP HQWDWRQ RI 5 HFODP DWRQ$ FWLYLWHVIRU6 XUHW 5 HODDVHWW UHTXHVWVHOHDVHRI DUHDVWKDWKDYHEHHQ UHFRQRXUHDQG VHHGHDQG P HHWWKHUHFODP HG GHMUHG SODQWFRP P XQLWHV 5' 3&V 7KH5' 3&VDUHGHVFUEHG LQ 1 HYDGD* XLGHOLQHVIRU6 XFFHVVIXO5 HYHJ HWDWRQ IRUWKH 1 HYDGD' LYLVRQ RI (QYLURQP HQWDO3URWHFWRQ WKH8 6 %XUHDX RI / DQG0 DQDJ HP HQWDQG WKH 8 6 ' $) RUHVW6HUYLFH 1 HYDGD* XLGHOLQHV $ VUHTXLUHG E\ WKH1 HYDGD* XLGHOLQHV ³WKHSODQW FRP P XQLW IRUWKH5' 3& VKRXOG EHGLYLDHV DQG Z KHQ DSSURSULDWIRUWKHVWWVKRXOG LQFOXGH J UDVVHV IRUEV VKUXEV DQG RUWHHV 7KH5' 3& VKDOOEHFRP SUHGRI VSHFLHVQDWYHWR WKHDUHD RUIQWRGXFHG VSHFLHVZ KHUHWKHQHHG LVGRFXP HQWG IRUIQFOXVRQ WR DFKLHYH WKHDSSURYHG SRW P IQLQJ OQG XVH 7KH5' 3& P XWP HHWWKHUHTXLUHP HQWVRI DSSOLFDEOHWDWDQG IHGHUDOVHG SRLVRQRXVDQG QR[IRXSOQWV DQG IQWRGXFHG VSHFLHVOZ VRUUHJ XDWRQV $ OO5' 3&VP XWEH DSSURYHG E\ WKHDJ HQFLHV´

$ TXDOLIHG ERWQLWZ RXOG HWWEOWK SURSRVHG UHHUHQFHDUHDVIRUFRP SDUVRQZ LWK WKH UHFODP HG J URZ WKIQ DFFRUGDQFHZ LWK1 HYDGD* XLGHOLQHV WWNLQJ IQWR FRQVLGHUDWRQ HOHYDWRQ VORSHV VRLOV DQG DVSHFW7 KHSURSRVHG UHHUHQFHDUHDVDQG SURWFROZ RXOG EH VXEP LWWG WR WKH %/ 0 DQG WKH1 ' (3 IRUUHYLHZ DQG DSSURYDO %DUUIFN KDVFRP SOHWWG D YHJ HWDWRQ VXUYH\ WR IGHQW\ WKHSURSRVHG UHHUHQFHDUHDV IQFOXGLQJ FRYHUSHFHQWJ HV %DUUIFN P D\ UHTXHWWERQG UHOHDVHIRUWKRVHUHFODP HG DUHDVZ KIFK P HHWWKHUHOHDVHFUWWUDDLWWUWKH%/ 0 DQG 1 ' (3 KDYH DSSURYHG WKHUHHUHQFHDUHDVDQG SURWFRO

5 HFODP DWRQ 6 FKHGXOH

7 KHDQWFLSDWG WP HIUP HIRUWKHH[SORUDWRQ DFWLWHVIV \ HDUVIURP WKHGDWRI DSSURYDO ([SORUDWRQ DFWLWHVDUHDQWFLSDWG WR FRQWQXHUHJ DUGOHVRI Z HDWHUFRQGLWRQV &RQFXUUHQW UHFODP DWRQ Z RXOG WQNHSODFHZ KHUHSUFWFDEOH ' UUOSDGVDQG URDGVZ RXOG EH UHFODP HG IQ DFFRUGDQFHZ LWK1 HYDGD5 HYLVHG 6 WWXXW 1 5 6 $ DQG IIQDOUHFODP DWRQ Z RXOG EH IQLWDWG RQFH WKHH[SORUDWRQ SURJ UDP KDVEHQ FRP SOHWG VXFK UHFODP DWRQ Z RXOG EH FRQFXGHG Z LWKQ WZ R \ HDUVRI FHVDWRQ RI H[SORUDWRQ DFWLWHVV

7 KHHWWP DWG WP HWX FRP SOHWWUHFODP DWRQ DVXP HVDYHUJ HSUHFLSLWWRQ RFFXUVGXUQJ WKH \ HDUIROORZ IQJ VHGLQJ 3HUGVRI GURXJ KWFRXOG GHD\ UHYHJ HWDWRQ Z KLOHH[FHVLYH SUHFLSLWWRQ FRXOG GHD\ UHFRQWXUQJ 7 KHWP HWX FRP SOHWWUHFODP DWRQ DQG FORVXUHDFWWLWHV LVDVXP HG WX EH VWJ HG IQ DP DQQHUWKDWDOORZ VFRP SOHWRQ RI HDUWZ RUNVZ LWKQ WX P RQWKV KRZ HYHU SODQQLQJ DQG ERQG FRWWFWWP DWRQ LVQRWGHSHQGHQWRQ Z KHWKHUWKH UHFODP DWRQ LVFRP SOHWWG IQ D VLQJOH\ HDUURUWZ R \ HDUV

3 RVWH[SORUDWRQ/ DQG 8 VHV

: KHQ WKHH[SORUDWRQ SURJ UDP LVFRP SOHWHG WKHSRVWH[SORUDWRQ DQG XVHZ RXOG UHYHLWEDFN WR WKHRUJ LQDODQG XVHV 0 DNUH[LWWQJ DQG XVHVLQ WKH+ & &8 (3 DUHDICFXGHDYHWRFN J UDJ LQJ Z LOGDIHKDEIWWP ICHUDH[SORUDWRQ DQG UHFUHDWRQ

* URZ WK 0 HGLD 6 WRFNSICQJ DQG 8 VH

0 DWUDOVDOYDJ HG IURP WKHGLWXUEHG DUHVZ RXOG EHUHSODFHG : KHUHDYDIDEOH LH QRWQ DUHV FRYHUHG Z LWK URFN VRLOVFDSDEOHRI VHLYLQJ DVJ URZ WK P HGLDZ RXOG EH VDOYDJ HG DQG WRFNSICQG DVSDLWRI WKHIICO ,Q DGGLWRQ WR WKHVRLOV DVP XFK RI WKHVRLORU DQIF P DWUDVSRWIEOHZ RXOG EHVDOYDJ HG WR P IQIP I] HFRP SDFWRQ DQG SURP RWDHUDWRQ

Seed Mixes

* HQHUDOO WKHIICQDOXUDFHRI EDFNICQHG VLWVDQG UHFRQWRXUHG URDGVZ RXOG EHQHWQ URXJ K FRQGLWRQ WR KROG VHHG DQG WR RSWP I] HJ HUP IQDWRQ 5 HFODP HG DUHDVZ RXOG EH VHHGHG E\ EURDGFDWWQJ DQG KDUURZ IQJ GUIOVHGIQJ RUK\ GUVHGIQJ DQG P XOFKIQJ Z LWK WKHDSSURYHG %/ 0 VHGP I[HV FKDQJ HVDQG RUDGXXWV HQW WR WKHVHGP I[DQG RUDSSQFDWRQ UDWP D\ EH P DGHXSRQ DSSURYDOE\ WKH%/ 0 6HHGIQJ VZ RXOG EHSODQWHG E\ KDQG 7 KHIQGLYIGXDOVHFIHV DQG DSSQFDWRQ UDWVKDYHEHHQ VHOHFWHG WR SURP RWRSWP XP VHHGJ HUP IQDWRQ DQG SODQW J URZ WK 6HHGIQJ Z RXOG WSIFDO RFFXUEHZ HHQ WKHP RQWKVRI 2 FWREHUDQG $ SUIOWR WXNH DGYDQWJ HRI WKHZ IQWUVSUIQJ P RLWXUH

%DUUFN KDVDQ RQJ RIQJ UHFOP DWRQ SURJ UDP WR VHGDUHDVWKDWKDYHEHHQ UHFRQWRXUHG 6HHG P I[HVDUHVKRZ QIQ

7 DEOH DQG **7 DEOH** %DUUFN KDVEHJ XQ DSURJ UDP RI KDQGSODQWQJ : \ RP IQJ %LJ VDJHEUXVK *Artemisia tridentata* VVS *wyomingensis* DQG EIWWUEUXVK *Purshia tridentata* VHHGIQJ VIQ UHFOP HG DUHDV 6IP IQDUSURJ UDP VIRUKDQG SODQWQJ VHHGIQJ VP D\ RFFXUIQ WKH IXWUHDVGHP HG QHFHVDU\ WR DFKIHYH WKHUHFOP DWRQ REMHFWWYHV

' IWXUEHG DUHDVZ KHUHDQ H[SORUDWRQ IQWHUHWWHP DIQV EXWIQDOUHFOP DWRQ IVQRW HWZ DUDQWG Z RXOG EH VHHGHG Z LWK WKHIQWUP VHHGP I[**7 DEOH** 7 KHSXUSRVHRI WKHIQWUP VHHGP I[IV WR WWEIQ] HVRIQV WR SUHYHQWHURVRQ DQG H[FHVVHGIP HQWWRQ IRUDUHDVWKDWP D\ EHUHGIWXUEHG IQ WKHIXWUH) HDXUHVWKDWP D\ XQGHJ R IQWUP VHHGIQJ IQFXGHURDG FXW VIGH FDWP DWUDO DQG GUIOSDGVDQG VXP SV

,Q WKHHYHQWRI VXUFHGIWXUEDQFHDWRFDWWG Z LWK DQ XQSODQQHG IOXIG UHOHDVH %DUUFN Z RXOG UHFRQWRXUDQ UIOVRUJ XQDHVUHXQWQJ IURP WKHUHOHDVH 6WDZ EDOHV Z DWWHV DQG RWKHUGIYHUVRQ FRQWROVP D\ EH XWWQ]HG WR SUHYHQWHURVRQ SHQGIQJ UHYHJHWWRQ 7 KHDIIHFWWG DUHDZ RXOG EH VHGHG KDQG VHGHG II WKHDUHDIVQRWDFFHWWEOHE\ HTXISP HQWXWIQJ WKH%/ 0 DSSURYHG VHGP I[

7 DEOH + & &8 (3 6HHG 0 IL KLJKHUHDMDWRQV DERYH IHHWDP VO

6SHFLHV	**2 GHU 6\ QRQ\ P V**	**&RP P RQ 1 DP H**	**3 HUFHQW RI P IL**	**6HHGV SHU VTXDUH IRRW**	**%LRDGFDW 5 DWH 3 / 6 SRXQGV DFUH**	**6HHGV SRXQG**
Pseudoroegneria spicata	*Agropyron spicatum*	%OXHEXQFK Z KHDWUDVV				
Thinopyrum intermedium	*Agropyron trichophorum*	3 XEHVFHQW Z KHDWUDVV				
Leymus cinereus	*Elymus cinereus*	%DOLQ Z LOGUH				
Elymus lanceolatus ssp. lanceolatus	*Agropyron dasystachyum*	7 KLFNVSLNH Z KHDWUDVV				
Festuca ovina		6KHHS IHVFXH				
Ericameria nauseosa	*Chrysothamnus nauseosus*	5 XEEHU UDEEEWXXVK				
Atriplex canescens		) RXUZ LQJ VDOWEXVK				
Purshia tridentata		$ QWHORSH EWWHUEUXVK				
Artemisia tridentata VVS wyomingensis		: \ RP LQJ EUJ VDJ HEUXVK				
Melilotus officinalis		< HOORZ EORVVXP VZ HHWFORYHU				
Sanguisorba minor		6P DOOEXUQHW				
Achillea lanulosa	*Achillea millefolium ssp lanulosa*	: HVWHUQ \ DUURZ				
Adenolinum lewisii	*Linum lewisii*	/ HZ LVLOLQ				
Penstemon palmeri		3HQVWHP RQ				
7 RWDOV						

7 DEOH + & &8 (3 6HHG0 IL ORZ HUHDMDWRQV EHORZ IHHWDP VO

6SHFLHV	2 ORHU 6\ QRQ\ P V	&RP P RQ 1 DP H	3 HUFHQW RI P IL	%URDGFDVW 6HHGVSHU VTXDUH IHHW	%URDGFDVW 5 DWH 3 / 6 SRXQGV DFUH	6HHGV SRXQG
Agropyron cristatum	*Agropyron desertorum*	&UHVWHG Z KHDWUDVV				
Leymus cinereus	*Elymus cinereus*	%DVLQ Z LOGUH				
Elymus lanceolatus ssp. lanceolatus	*Agropyron dasystachyum*	7 KLFNVSLNH Z KHDWUDVV				
Poa secunda	*Poa sandbergii*	6DQGEHUJ EOXHJ UDVV				
Achnatherum hymenoides	*Oryzopsis hymenoides*	,QGLDQ ULFHJ UDVV				
Elymus elymoides	*Sitanion hystrix*	%RVWHUEUXVK VTXLUUHOWDLO				
Sanguisorba minor		6P DOOEXUQHW				
Ericameria nauseosa	*Chrysothamnus nauseosus*	5 XEEHU UDEELWEUXVK				
Penstemon palmeri		3DOP HU SHQVWP RQ				
Achillea lanulosa	*Achillea millefolium ssp lanulosa*	: HVWHUQ \ DUURZ				
Atriplex canescens		) RXUZ LQJ VDOWEXVK				
Artemisia tridentata ssp. wyomingensis		: \ RP LQJ EUJ VDJ HEUXVK				
Atriplex confertifolia		6KDGVFDOH				
Kraaschninnikovia lanata	*Eurotia, Ceratoides lanata*	: LQWHUJDW				
7 RWDOV						

7DEOH ,QWHUP 6WHLQ&DWRQ6HHG0 IL

6FLHQWLF1DPH	**&RPPRQ1DPH**	**$SSOLFDWRQ5DWH EURDGFDVW SRXQGVSXUHOYHVHGSHUDFUH**
Medicago sativa	$OIDOID	
Agropyron crisatum	&UHVWG:KHDWUDVV	
7RWDO$SSOLFDWRQ5DWH		

1R[IRXV: HHG0DQDJHPHQW

:HHGPDQDJHPHQW:RXOGIRORZ WKHVHGHVFUEHG LQ6HFWRQ ILQFXGLQJ WKRVHGHVFUEHG LQWKH+&&8(3 CR[IRXV:HHGPDQDJHPHQW$OD (6&2 **$SSHQGL ***

'LVSRVDORI6WXFWXUHV(TXLSPHQWDQG0DWHULDOV

7HP SRUDU\ IDFLOWHV VXFK DVSRUWEOHWRLOHWVRUVWRUDJHWDQOHV:RXOGEHUHPRYHGIURP WKHVLWH GXULQJ UHFODPDWRQDFWLYLWHV

:KHQGULOOLQJ DFWLYLWHVDUHFRPSOHWHG GULOOVWHO GULOOLQJ SURGXFW SRUWEOHOLKW SODQWJHQHUDWRUV RUWKHUGULOOLQJ HTXLSPHQW:RXOGEHUHPRYHGIURP WKHVLWH:KHQWKHGULOOLQJ FRQWUDFWRUGHPREOLHV

5RDG'ULOOLQ&DG DQG6XPS5HFODPDWRQ

5RDGV:RXOGEHQDUURZHG WRDSSUR[LPDWHSUHGLVWXUEDQFHFRQGLWRQVDQG:RXOGEHUHFODLPHG XQOHVVWKHUHLVDVXEVHTXHQWJUHHQ:LWKWH%/0 WXP DLQWHQDQFH:RXOGEHSHUIRUPHG SRWFRVXUHURG DFFHVV'ULOOSDGVDQG VXPSVQRORJHUQHHGHGIRUH[SORUDWRQDFWLYLWHV:RXOGEHUHFODLPHG

5HFODPDWRQRI WKHURDGVLQYHV WWHS WWUDLQ WWHSHUWKDQ + 9 P D\ UHXQWQRUJLQDO WRSRJUDSK\ QRWHEHQJ DWWDQHG ,QWKLVFDVH WKHFURW VHFWRQ:RXOGEHEOHQGHG WRHQVXUHQR WWHSHUWKDQ + 9 VORSHVH[FHSWZKHUHFXWEDQNVDUHRQWKHLQWGHRI WKHURDG DQGORFDWHG JHQHUDOO ILQEHGURFN

,QWKH+&&8(3 3DQDUHD URDGVDQG VLHW EHUP VZ RXOGEHJUDGHGDSSUR[LPDW WRWKH RUJLQDOFRQWRXUEHRUHGLWXUEDQFH:KHUHWKHURDG LVORFDWHG RQ ILOO WKHVLGH VORSHVZ RXOGEH URXQGHG DQGJUDGHG WR + 9)LQLVKHG VORSHVZ RXOGEHUHDWWHW WP ILDUWR WKHVXUURXQGLQJ WRSRJUDSK&RP SDFWG URG VXUFHVZ RXOGWHQEHUSSHG FRYHUHG:LWKUHFODP DWRQP DWHULDO IURP WKHVLHW EHUP VRURG ILOO DQG UHYHJHWDWG '&WKHVWDW:RXOGQR ORQJHUEHUHTXLUHG Z RXOGEHJUDGHG DQG XQHHGHG FXOYHLWUHP RYHG 6RP HDFFHVURGVP D\ EHQHHGHG WR DFFHVV P RQLWRULQJ SRLQW

'ULOO+RO3OXJJLQJ DQG:DWU:HO&EDQGRQP HQW

0ILQHUDOH[SORUDWRQ GHYHORSP HQWDQG FRQGP QDWRQ GULOOKROHVDVZ HOODVP RQLWRULQJ DQG SURGXFWRQ:HOOVXEMHFWWR1'&5 UHJXODWRQVZ RXOGEHDEDQGRQHGLQDFFRUGDQFHZ LWK DSSOLFDEOHUXOHVDQG UHJXODWRQV 1$&WKURXJK %RUHKROHVZ RXOGEHVHDOHG WR SUHYHQWFURVVFRQWP ILQDWRQEHWZHHQ DTXLIHUV DQG WKHUHTXLUHG VKDOORZ VHDOZ RXOGEHSODFHG WR SUHYHQWFRQWP ILQDWRQE\ VXUFHDFFHVV

3 RVWUHFODP DWRQ 0 RQLWRULQJ DQG 0 DLQWHQDQFH

) RORZ LQJ WKH HQG RI H[SORUDWRQ DFWLYLWLHV EHJ DQG VJ QP DLQWHQDQFH VLWHLQVSHFWRQV DQG RWKHUQHFHVDU\ P RQLWRULQJ IRUWKHSHUURG RI UHFODP DWRQ UHSRQVEILOLW Z RXOG EHFRQGXFWHG 0 RQLWRULQJ RI UHYHJ HWDWRQ VXFFHVVZ RXOG EHFRQGXFWHG DQQXDOO XQWOWKHUHYHJ HWDWRQ WDQGDUGVKDYHEHQP HWDVGHWHUP ILQHG E\ WKH%/ 0 DQG WKH1 ' (3 5 HYHJ HWDWRQP RQLWRULQJ Z RXOG RFFXUEDVHG RQ VHDVRQDOJ URZ WK SDWWHUQV QHDUE\ UHHUHQFHDUHDYHJ HWDWRQ SDWWHUQV SUHFLSLWDWRQ DQG Z HDWKHUFRQGLWRQV 1 R[IRXVZ HHG P RQLWRULQJ Z RXOG EH XQGHUWDNHQ ILQ FRQMXQFWRQ Z LWK UHYHJ HWDWRQ P RQLWRULQJ

0 HDVXUHVWR EHWDNHQ GXULQJ ([WQGHG 3 HUURGVRI 1 RQ 2 SHUDWRQ

7 KH VWDQGDUG RSHUDWQJ VFKHGXOHVDWWKH+ & &8 (3 DUHDZ RXOG EH XS WR KRXUVDGD\ GD\ VD\ HDU 1 R WP SRUDU\ RUILQWUP FORVXUHVRI WKHH[SORUDWRQ SURJ UP DUHSODQQHG + RZ HYHU GXH WR Z HDWKHUFRQGLWRQV P HFKDQLFDORUWFKQLFDOGLIIFXOWHV XQ DYRUDEOH HFRQRP IF FRQGLWRQV OWW DWRQ VHYHUHVHVP IF HYHQW RURWKHUXQ IRUHVHQ HYHQW DFWYLWHVP D\ KDYHWR EHWP SRUDUO FHDVHG

,Q WKHHYHQWWKDWFRQWQXRXVRSHUDWRQ LVLQWUXSWG GXHWR HFRQRP IF FRQVGHUDWRQVRU XQ RUHVHQ FLUFXP WWQFHV FDUHDQG P DLQWHQDQFHP D\ EHLQLWDWG DVRXWQHG EHORZ

- 5 RDGV 7 KHP DWUURGVZ RXOG UHFHLYHP DLQWHQDQFH DVQHFHVDU\
- (URVIRQ &RQWRO 0 HDXUHV $ OOHUVIRQ FRQWROP HDXUHVDQG %0 3 VZ RXOG EH UHJ XODUO LQVSHFWG DQG P DLQWHQG

3HU1 $ & $ %DUUFN Z RXOG QRW\ WKH%/ 0 DQG WKH1 ' (3 %XUHDX RI 0 LQLQJ 5 HJ XODWRQ DQG 5 HFODP DWRQ LQ Z UWQJ Z LWLQ GD\ VD LWUDQ\ SURYLFWXXVSHQIRQ WKDWV DQWFLSDWG WX DWWRQ HUWKDQ GD\ V %DUUFN Z RXOG LGHQW\ WKHQDXUHDQG UHDVRQ IRUWKH VXVSHQIRQ WKHGXUDWRQ RI WKHVXVSHQIRQ DQG WKHHYHQWH[SHFWG WX UHXXOWLQ HWKHU UHXXP SWRQ RI H[SORUDWRQ RUWKHDEDQGRQP HQWRI WKH H[SORUDWRQ SURYLFW

1 R$ FWRQ$ OWLQDWYH

8 QGHUWKH1 R$ FWRQ$ OWLQDWYH %/ 0 Z RXOG QRWJ UDQWDSSURYDORI WKH3 OD Q0 RGLIIFDWRQ DQG $ GGHQGXP ([SORUDWRQ DQG UHFODP DWRQ DFWYLWHVZ RXOG FRQWQXHLQ RSHQ DQG DFWYHDUHDV RQ\ 7 KH1 R$ FWRQ$ OWLQDWYHLQFRUSRUDWWVWKH$ SSOLFDQWFRP P LWWG(30 VLGHQWLHG LQ WKH + & &8 (3 ,, ($ %/ 0 D DQG VXSHUVHGHG E\ WKH $ GGHQGXP WX + & &8 (3 ,, ' 5) 2 1 6, %/ 0 D DQG $ XJ XW ' 5 %/ 0 D 7 KHVHP HDXUHVDUHWKH &RQGLWRQVRI $ SSURYDOLQ WKH%/ 0 3 OD RI 2 SHUDWRQV$ SSURYDO 0 D\ Z KLFK LQFRUSRUDWWVE\ UHHUHQFH($ QXP EHU1 9 ($ DQG WKH$ GGHQGXP WX WKH($ 1 RYHP EHU Z LWK IXUWHUGHLQHG FRQWXFWRQ GHWJ Q DQG RSHUDWRQDOP HDXUHVIRU GUOOQJ VXP SVDVRXWQHG LQ WKH%DUUFN UHSRUWGDWG' HFHP EHU

8 QGHUWKH1 R$ FWRQ$ OWLQDWYH WKH3 OD Q$ P HQGP HQW Z RXOG QRWEHDSSURYHG $ GGLWRQDO H[SORUDWRQ DFWYLWHVSURSRVHG E\ %DUUFN LQ WKH3 OD Q$ P HQGP HQW Z RXOG QRWEHDXWRUL]HG RU IP SOHP HQWG

3 DWW3 UHVHQWDQG 5 HDVRQDEO) RUHVHHDEOH) XWXUH$ FWRQV

&XP XODWLYHIP SDFWDUHGHLQHG DV³ WKHIP SDFWRQ WKHHQYLURQP HQWZ KIFK UHXOWVIURP WKH LQFUHP HQWDOIP SDFWRI WKHDFWRQ Z KHQ DGGHG WR RWKHUSDWWSUHVHQWDQG 5)) $ VUHJDUGHVRI Z KDWDJHQF\ IHGHUDORUQRQ IHGHUDO RUSHUVRQ XQGHUWNHV VXFK RWKHUDFWRQV &XP XODWLYH IP SDFWFDQ UHXOWURP LQGLYLGXDO P LQRU EXWFRQHFWLYH) VLJQLIFDQWDFWRQVWNLQJ SODFHRYHU DSHUURG RI WP H &) 5

3 URNHFWDQG DFWRQVFRQVLGHUHG LQ WKHFXP XODWLYHHIHFWDQD) VLVDUHGHLQHG IRUWKLV($ DV WKRVHSDWWSUHVHQWDQG 5)) $ VWKDWFRXOG LQWUDFWZ LWK WKH 3 URSRVHG $ FWRQ LQ DP DQQHUWKDW Z RXOG UHXOWLQ FXP XODWLYHIP SDFW 7 KHSDWWDQG SUHVHQWDFWRQVDQG 5)) $ VZ HUHGHVFUEHG LQ GHWDLOLQ WKH&RUW\ + LOOV([SDQVRQ 3 URNHFW JLQDO(QYLURQP HQWO, P SDFW6 WDWP HQW) (,6 %/ 0 F DQG DUHXSGDWG IRUWKLV($ DQD) VLV 7 KHVHSURNHFWDQG DFWRQVDUHLGHQWLIHG LQ **7 DEOH**

7 KHDUHD RI FRQFHLQ IRUFXP XODWLYHHIHFWYDUHVE\ UHRXUFH DQG FXP XODWLYHIP SDFWFRXOG LQYROYHP RUHWKDQ VXUFHGLWXUEDQFH 7 KHFXP XODWLYHHIHFWVWXG\ DUHDLQFOXGHVWKH + & &8 (3 3DQ ERXQGDU\ DWDP LQIP XP $ GGLWRQDOGHWDLOVIRUUHRXUFH VSHFLIF FXP XODWLYH HIHFWVWXG\ DUHDVDUHGHVFUEHG LQ UHRXUFH VHFWRQVRI &KDSWU DVDSSOLFDEOH 7 KHSHURG RI SRWQWDOFXP XODWLYHIP SDFWVGHLQHG DVWKH \HDUVRI H[SORUDWRQ DFWLWLHVIURP WKHGDW RI DSSURYDORI WKH+ & &8 (3 3DQ 0 RGLIIFDWRQ DQG $ GGHQGXP DQG WKH+ & &8 (3 3DQ $ P HQGP HQWSOXVWZR \HDUVRI UHOD P DWRQ 7 KHFXP XODWLYHHIHFWDQD) VLVLQ WKLV($ WHUVRII RI DQ H[SDQGVWKHDQD) VLVLQ WKH&RUW\ + LOOV) (,6 %/ 0 F

7 DEOH 6 XUUHFH' LVWXUEDQFH$ WWRFHDWG Z LWK 3 DWWDQG 3 UHVHQW$ FWRQVDQG 5)) $ V

$ FWRQ	3 DWWDQG 3 UHVHQW $ SSURYHG ' LVWXUEDQFH DFUHV	5)) $ 3 URNHFWG ' LVWXUEDQFH DFUHV	7 RWO $ SSURYHG 3 URNHFWG ' LVWXUEDQFH DFUHV
0 LQLQ 3 URNHFW			
%DFN5 RFN&DQ\RQ0 LQH			
%XFNKRUQ0 LQH			
&DSSHU0 LQH			
%DUUFN&RUW\ ,QF %&, &RUW\ * RQG0 LQH &* 0 2 SHUDWRQV$ UHD LQFO 3DQ $ P HQG			
%&, &* 0 2 SHUDWRQV$ UHD 3DQ $ P HQG			
%&, + RUVH&DQ\RQ			
%&, 5 REHOWRQ0 LQH			
%&, 6 DWHDWW0 LQH6 RXWKHDWRI &RUW\ + LOOV			
%&, 6 DWHDWW0 LQH1 RUWK 1 RUWKZ HVWRI			

7 DEOH 6 XUIDFH' LVWXUEDQFH$ WWRFKDWG Z LWK 3 DWWDQG 3 UHVHQW$ FWRQVDQG 5)) $ V

$ FWRQ	3 DWWDQG 3 UHVHQW $ SSURYHG ' LVWXUEDQFH DFUHV	5)) $ 3 URMHFWG ' LVWXUEDQFH DFUHV	7 RWDO $ SSURYHG 3 URMHFWG ' LVWXUEDQFH DFUHV
3 ISHDQH 6 RXWK 3 ISHDQH			
&RUWM 6 LOYHU0 LQLQJ ' LVWUFW			
(OGHU&UHHN0 LQH			
) R[0 LQH			
* UH WRQH0 LQH			
* UH (DJOH3 URMHFW			
+ RV6 SULQJV6 XOXU0 LQH			
0 D 0 LQH			
0 LOO&DQ RQ			
0 XG6 SULQJ * XOFK			
6 RXWK 6 LOHFLIHG 3 URMHFW			
8 WK0 LQHDQG&DP S			
6 XEWRWO			
			([SORUDWRQ
1 RWHV%/ 0 %0 ' 2 IIIFH H[SLUHG SHQGLQJ DQG DXWKRU]HG			
3 ODQV %/ 0 %0 ' 2 IIIFH			
1 RWHV %/ 0 (O) IHOG2 IIIFH			
%&, &* 0 2 SHUDWRQV$ UHD			
%&, &RUWM 8 QGHJ URXQG([SORUDWRQ 3 URMHFW			
%&, + & &8 (3			
%&, : HVW3 LQH9 DOOH			
%&, : HVW6 LGH			
&* 0 2 SHUDWRQV$ UHD			
%&, + LOORWS ([SORUDWRQ0 LQH			
%&, 3 ISHDQH 6 RXWK 3 ISHDQH* RGG$ FUHV ([SORUDWRQ 3 URMHFW			
%&, 5 REHUWRQ 3 URMHFW			
&RUDO5 HVRXUFHV5 REHUWRQ0 LQH			
' HDQ0 LQH			
) LUH&UHHN([SORUDWRQ 8 QGHJ URXQG 3 URMHFW			
0 XG6 SULQJV			
5 REHUWRQ([SORUDWRQ 3 URMHFW			
6 DQWD) H0 LOO&DQ RQ			

%DUUIFN + & &8 (3 3 OQ RI 2 SHUDWRQV0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQW($

7 DEOH 6 XUIDFH' LVWXUEDQFH$ WWRFKDWG Z LWK 3 DWWDQG 3 UHVHQW$ FWRQVDQG 5)) $ V

$ FWRQ	3 DWWDQG 3 UHVHQW $ SSURYHG ' LVWXUEDQFH DFUHV	5)) $ 3 URMHFWG ' LVWXUEDQFH DFUHV	7 RWDO $ SSURYHG 3 URMHFWG ' LVWXUEDQFH DFUHV
6 RXWK 5 REHUW			
7 RL\ DEH 3 URMHFW			
8 KDOOH/ HDVH			
0 ICO&DQ RQ([SORUDWRQ			
6 XEWRWDO			
8 WDWHV&RP P XQLW			
6 WDW5 RXW IHHWZ IGH			
* UDYHO5 RDGVIQ&UHVFHQW0 DOOH IHHWZ IGH			
' ILW5 RDGVIQ&UHVFHQW0 DOOH IHHWZ IGH			
3 RZ HUOLQHVIQ&UHVFHQW0 DOOH IHHWZ IGH			
%&,) IEHU2 SWF &DEOH IHHWZ IGH			
%&, -HUHP \¶V CRE &RP P XQLFDWRQV7 RZ HU DQG UJ KWRI Z D 5 2 :			
7 RZ QVRI &UHVFHQW0 DOOH DQG %HRZ DZ H			
6 XEWRWDO			
2 WKHU HYHOSP HQWDQG $ FWRQV			
%/ 0) XHO5 HGXFWRQ 3 URMHFW			
: ICOGILUHV			
5 HFUHDWRQ			
/ LYHWRFN			
$ J UIFXOWXUH' HYHOSP HQW			
%&, $ GGLWRQDO, UUJ DWRQ 3 LYRWDW HDQ 5 DQFK			
/ RGJ HDV3 ICH9 DOOH			
&UHVFHQW0 DOOH : DWLU6 XSSO			
6 XEWRWDO			
7 RWDO			

+ LWRUF P ICIQJ DQG H[SORUDWRQ UHDWG GLWXUEDQFHI ILWWEHJ DQ IQ SUIRUWRWKHSURP XO DWRQ RI VXUIFHODQG P DQDJ HP HQWDZ VDQG UHJ XDWRQVJ RYHQIQJ P ICIQJ DFWLWHVRQ SXEOF OQGV HJ) / 30 $ DQG &) 5 6 ICFHWKHUH Z HUHQ OZ VRUUHJ XDWRU SURJ UDP VIQ SOFHDWWDWWP H WKHUHZ HUHQ UHJ XDWRU RUDGP ICIWWDWYHDSSURYDOVJ UDQWG 7 KHUHRUH WKHIGHQWIHG GLWXUEDQFHI DFUHDJ HGRHVQRWQFOXGHDOKLWRUF P ICIQJ UHDWG GLWXUEDQFHI IQ WKHDUHD

3 OQVDQG QRWFHVRXWLGHRI WKHJ HQHUDO&UHVFHQW0 DOOH DUHDKYHQRWEHHQ TXDQWIHG

&RUDO5 HVRXUFHV¶5 REHUWRQ([SORUDWRQ 3 URMHFWERXQGDU LVORFDWG IP P HGIDWO QRUWKRI DQG SDUWOOO Z LWIQ WKH&* 0 2 SHUDWRQV$ UHD

%DUUIFN KDVXEP LWWG D3 OQ DP HQGP HQWRWKH0 ICO&DQ RQ([SORUDWRQ 3 URMHFWRUFRQWXFWRQ RI XQGHJ URXQG H[SORUDWRQ GHFOICIQHV DQFICOOU IDFICOWFV DQG FRQWQXHG VXUIFHH[SORUDWRQ 7 KHUHZ RXG EHQ QHWCFUHDHIIQ VXUIFHGLWXUEDQFHI URP WKH DFUHVRI GLWXUEDQFHI DXWRUJ HGIQ

%DUUIFN + & &8 (3 3 OQ RI 2 SHUDWRQV 0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQW($

5 2 : Z RXOG UXQ IURP VWH/ RGJ HDV3 ICH9 DOOH VX %&, &RQWRO 3URYLFWG 5 2 : OHQ VWKLVDSSUR[IP DWH) P ICOH

%&, IDFLOLW ORFDWG IQ 7 1 5 (6RXWK 6 6(6(MXWQRUWKRI VWH&* 0 2 SHUDWRQV $ UHD 5 2 : 1

6 XUJFHGLWXUEDQFHDVRFLDWG Z LWK VWHWZ QVRI &UHVFHQV9 DOOH DQG %HRZ DZ HIVDVXP HG VX EH DQG DFUHV UHVHFWXHO Z LWK DSSUR[IP DWH) DFUHVRI SUIYDWGHYHORSHG OQG SHUSKHUDOXX VWHWZ QV

,QFOXLYHRI DFUHJ HDVRFLDWG Z LWK VWH&UHVFHQV9 DOOH : ICOOQG 8 UEDQ,QWUJFH) ILH' HHQVH6 \ VWP 7 RQNQ+ DJ DGRXV) XHOV5 HGXFWRQ 3URYFW5 HG + ICOV+ DJ DGRXV) XHOV5 HGXFWRQ 3URYFWDQG VWHSURSRVHG JUHDWUVDJ HJURXVH(30 2 I VWH VXWDOFUHJ H SOQQHG SUHVUEHG EXLQVZ RXOG DIIHFWXS VX DFUHVRI SIQ RQ MXQ SHUZ RRGQQG DQG DFUHVRI SIQ RQ MXQ SHUZ RRGQQG Z RXOG EH VXLQHG 7 KH+ & &8 (3 JUHDWUVDJ HJURXVH(30 DFFRXQWVIRUIXXUHWXHDW HQWRI DFUHVRI HQFUDFKLQJ SIQ RQ MXQ SHU

5 HOHFWVDFUHJ HRI YHJ HWXRQ DIIHFWG E\ Z ICOOQG ILUHVIURP VXURXJ K 7 KHDFUHJ HIVICFOXVLYHRI DSSUR[IP DWH) DFUHVRI ILUH DIIHFWG SIQ RQ MXQ SHUZ RRGQQG

6 XUJFHGLWXUEDQFHDVRFLDWG Z LWK UHFUHDWRQ DFWXWWHVKDVRFFXUHG KRZ HYHU VXHDFUHJ HVKDYHQRWEHHQ TXDQWIHG

6 XUJFHGLWXUEDQFHDVRFLDWG Z LWK [LWQJ DQG SURSRVHG OYHWRFN Z DWUXVHIVDVXP HG VX EH DFUHSHUZ DWUUJ KW7 KH VXUJFHGLWXUEDQFHDVRFLDWG Z LWK VWHOYHWRFN 5)) $ VIVEDVHG RQ SURYFWG VHCIQ DFWXWWHV FKDQ HIQ YHJ HWXRQ DQG KDEWXW DFUHSHUZ DWUGHYHORSP HQWDFWXWW DQG DFUHVIRUIHCFIQ DQG FDWHJ XDIGV / LYHWRFN UHDWG DFWXWWHV RXWGHRI VXH&DUFR / DNHDORW HQWKDYHQRWEHHQ TXDQWIHG

6 XUJFHGLWXUEDQFHDVRFLDWG Z LWK DJ UFXOXUDOGHYHORSP HQWVEDVHG RQ VXHDFUHJ HXQGHUUUJ DWRQ DQG DVXP HVVXDO FKDQ HIQ YHJ HWXRQ DQG KDEWXW FXDWV VX VXUJFHGLWXUEDQFH $ FUHJ HYDOXHVZ HUHEDVHG RQ D) HEUXDU \SHFIDO K\ GUJ UDSKIF DEWXDFWRU+ \ GUJ UDSKIF %DVQ 1 R IURP VXH1 HYDGD' LYLVIRQ RI : DWU5 HXRXUFHV 7 KHVHYDOXHVDUH EDVHG RQ SHUP IWWG RUDXWRU] HG XVHRI Z DWUDQG P D QRWGH0FWDFWDOXVHIQ DJ LYHQ \ HDU

7 KLVIDFLOW LVORFDWG RQ VXH-' 5 DQFK 5 RDG DSSUR[IP DWH) IRXUP IOHVZ HWXRI 6 VXW5 RXW DWXH%&, RZ QHG-' 5 DQFK 7 KHIDFLOW SURYLGHVDFFRP P RGDWRQVIRUXS VX Z RUNHUV

6 RXUFH %/ 0 D

$ IIHFWLG (QYLURQP HQWDOQG (QYLURQP HQWDO&RQVHTXHQFHV

7 KLVFKDSWUGHVFUEHVWKHHQYLURQP HQWDOIIHFWLG E\ WKH3URSRVHG $ FWRQDQG WKH1 R $ FWRQ DOWHUQDWLYHV WKHDQWLSDWLG GLUHFWDQG LQGLUHFWP SDFWVRI WKH3URSRVHG $ FWRQ DQG WKH1 R $ FWRQ DOWHUQDWLYHV DVZ H0DVSRWQWDOFXP XODWLYHIP SDFW 7 KHDQD0VLVRI SRWQWDOIP SDFWRI WKH3URSRVHG $ FWRQ LQFRU$RUDWVIP SO0P HQWDWRQ RI WKHDSSOLFDQWFRP P LWWG (30 VIGHQWLIHG LQ6HFWRQ $ GGLWRQDOSURWFWRQP HDXUHVIGHQWLIHG IRULQGLYLGXDOUHRXUFHVLQ UHVSRQVH WR DQWLSDWLG IP SDFWVDUHGLVFXVHG DWWKHHQG RI HDFK UHRXUFHVHFWRQ DVDSSOLFDEO0H

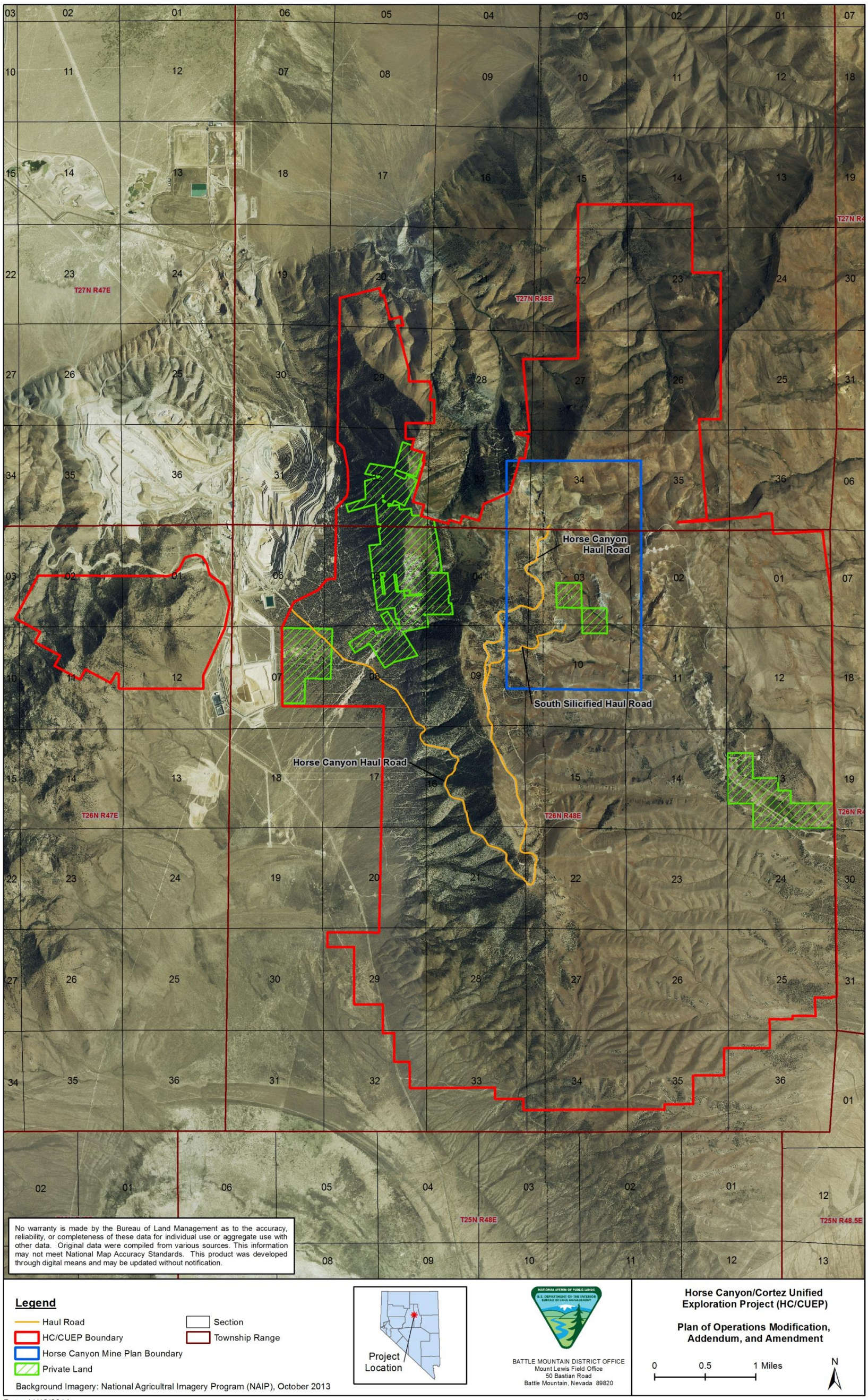
) RUUHRXUFHVZ KHUH+ & &8 (3 SURWFW\SHFLLF IP SDFWDUHLGHQWLIHG WKH3URSRVHG $ FWRQ LV FRQVLGHUHG Z LWK RWKHUSDWWQG SUHVHQWFWRQVDQG5)) $ VWXDVHVWKHSRWQWDOIRUFXP XODWLYH HIIHFW 7 KHDUHDFRQVLGHUHG LQ WKHFXP XODWLYHHIIHFWDQD0VHVGLIIHUVE\ UHRXUFH $ WD P DJIP XP WKHFXP XODWLYHDQD0VLVFRQVLGHUVSURWFWWKDWKDYHFDXVHG VXUDFHGLWXUEDQFH Z LWKLQ DJ HRJ UDSKIF DUHDWKDWLQFRU$RUDWVWKHVRXWZ HVWLQ SRUWRQ RI 3LQH9 DOOH WKHVRXWHLQ SRUWRQ RI &UHVFHQW9 DOOH DQG WKHQRUWKHLQ SRUWRQ RI * UDW9 DOOH 7 KHSHUURG RI SRWQWDO FXP XODWLYHIP SDFWVVGHLQHG DVDSSUX[IP DWO \ HDUV SOXVWZR DGGLWRQDO\ HDUVIRUIILQDO UHFOP DWRQ

* HQHUDO6HWWQJ

7 KH+ & &8 (3 DUHDSULQFLSDO0 OHVDORQJ WKHHDWWLGHRI WKH&RUW] 0 RXQWLQVLQ(XUHNDDQG / DQGHUFRXQWHV 1 HYDGD $ VP DOOSRUWRQ RI WKH+ & &8 (3 DUHDH[WQGVWR WKHZ HWWLQ IODQN RI WKH&RUW] 0 RXQWLQV &XUUHQW[SORUDWRQ DFWYLWHVZ LWKLQ WKH+ & &8 (3 3DQ ERXQGDU\ KDYH EHHQ FHQWDO]HG LQ WKH+ RUVH&DQ RQ DUHD 8 QGHUWDQGLQJ WKHH[SORUDWRQ KLVWRU\ LVIP SRUWQW Z KHQ FRQVLGHULQJ VXUDFHGLWXUEDQFHDVRFIDWG Z LWK+ & &8 (3 DFWYLWHV 3UH URDGV FUHDWG LQ WKH+ & &8 (3 DUHD DUHQRVSDUWRI WKHH[LWQJ DFUHVRI + & &8 (3 H[SORUDWRQ GLWXUEDQFH

7 KH+ RUVH&DQ RQ KDXURUG Z KLFK FRQQHFWV WKH&RUW] 0 ILO DUHD WR WKHIRUP HU+ RUVH &DQ RQ0 ILQH LVDXWRU]HG XQGHUWKH&RUW] 0 ILQH3DQ 1 9 1 DQG WKH+ RUVH&DQ RQ 0 ILQH3DQ 1 9 1 $ GGLWRQDOVXUDFHGLWXUEDQFHDXWRU]HG E\ WKH+ RUVH&DQ RQ 0 ILQH3DQ ILQFOXGHVRSHQSLW Z DWWURFNGLVSRVDOIDFLOW DQG VXSSRUWQJ URDGV **) LJXUH** VKRZ VWKH+ & &8 (3 3DQ ERXQGDU\ DQG WKH+ RUVH&DQ RQ0 ILQH3DQ ERXQGDU\ RYHODLG RQ 1 DWRQDO$ J UIFXOWXUH,P DJ HU\ 3URJ UDP 1 $,3 IP DJ HU\ GDWG

) LJXUH * HQHUDO6 HWWQJ



Date: 11/12/2014

6XSSOHP HQWDO$ XWKRULWLHV5 HVRXUFHV&RQVLGHUHG IRU$ QDO0 VLV

7KH%/ 0 ¶V1 (3$ +DQGERRN+ %/ 0 D DQG1 HYDGD,0 &KDQJH UHTXLUHWKDW(3$ GRFXP HQWDGGUHVVVSHFLIF HOHP HQWRI WKHHQYLURQP HQWWKDWUHVXEMHFWWR UHTXLUHP HQWVSHFLIIHGLQ WXXXW UHJXODWRQ RU(2 LH VXSSOHP HQWDOXWKRUWLHV

7DEOH OLWWWKHVXSSOHP HQWDOXWKRUWLHVWKDWP XWEHDGGUHVVHGLQDOO HQYLURQP HQWDODQDO VHV

7 DEOH ICFOXGHVRWKHUUHVRXUFHVGHHP HG DSSURSUDWH IRUHYDOXDWRQ E\ WKH%/ 0 7 KHVHWDEOHV DOVR ICGLFDWH WKH UDQHOP HQWRUUHVRXUFHZ DVDQDO] HG ICQWKH($ DQG WKHORFDWRQ ICQWKLV FKDSWUZ KHUHWKHHOP HQWRUUHVRXUFHLVDGGUHVVHG 7 KHHOP HQWDQG UHVRXUFHVWKDWGR QRW RFFXUICQWKH+ & &8 (3 DUHDRUZ RXOG QRWEHDIIHFWG EDVHG RQ ICQWUCQDOVFRSICQ DUHQRW GLVFXVVHG IXUWKHUICQWKLV($ 7 KHHOP ICDWRQ RI QRQ UHOHYDQWHOP HQWFRP SOHVZ IWK WKH&(4 SRQF\

7 DEOH 6XSSOHP HQWDO$ XWKRUWLHVWR EH&RQVLGHUHG

6XSSOHP HQWDO $ XWKRUWLW	**1 RW 3 UHVHQW**	**3 UHVHQW0 DL %H$ IIHFWG**	**($ 6HFWRQ1 XP EHUR 5 DWRQDOHIRU(OP ICDWRQ**
$ ILU4 XDOW		[	
$ UHDVRI &UWFDO (QYLURQP HQWDO &RQFHQ $ &(&	[		: RXOG QRWEHDIIHFWG 1 R $ &(&VRFFXUICQWKH+ & &8 (3 YIFICQW
&XOWXUDO5 HVRXUFHV		[	
(QYLURQP HQWDO-XWWFH	[		%DVHG RQ DUHYLHZ RI H[LWWQJ EDVHDQHGDW QR P ICRUW RU OWZ ICFRP HJ URXSVZ RXOG EH GLVSURSRUWRQDWW DIIHFWG E\ KHDWKRUHQYLURQP HQWDOHIIHFW DVDUHXOWRI IP SOHP HQWWRQ RI WKH3URSRVHG $ FWRQ 7 KLV HOP HQWLVQRVSUHHQWZ IWKICQ WKH SURWHFWDUHDRUYIFICQW DQG IVQRV IXUWKHUDQDO] HG ICQWKLV($
) DUP / DQGV SUIP HRU XQITXH	[		: RXOG QRWEHDIIHFWG 1 R SUIP H RUXQITXHIDUP ODQGVRFFXUICQWKH + & &8 (3 YIFICQW
) OORRGSODLQV		[	: RXOG QRWEHDIIHFWG 3URSRVHG DFWYLWHVZ RXOG QRWDOWUQDXUDO IOORRGSODLQV SURWHFWDUHDRFFXLV Z IWKIQ=RQH& OORZ UDN
) RUHWVDQG 5 DQJHDQGV + HDOWK) RUHWVE HVRUDWRQ$ FW >+) 5 $ @RQO	[		: RXOG QRWEHDIIHFWG + & &8 (3 GRHVQRWP HHWWKH UHTXLUHP HQWVWXTXDOI\ DVD +) 5 $ SURWHFW
+ XP DQ+ HDOWKDQG 6DIHW + HUEIFIGH 3URWHFW		[	7 KHSURWHFWP DI XVHKHUEIFIGHV IQ DFFRUGDQFHZ IWK %DUUFN¶V DXWRU]HG QR[IRXVZ HHG P DQDJHP HQWSODQ VHH6HFWRQ KRZ HYHU (2 Z RXOG QRWDSSO DVSHWWFIGHV DQG KHUEIFIGHVZ RXOG QRWEH XVHG IQ OORFDWRQVZ KHUHFKLOGUHQ Z RXOG EHH[SRVHG
0 IJ UDWRU %LGV		[	

7 DEOH 6XSSOHP HQWDO$ XWKRULWLHV WR EH&RQVLGHUHG

6XSSOHP HQWDO $ XWKRULWLW	1 RW 3 UHVHQW	3 UHVHQW1 RW $ IIHFWHG	3 UHVHQW0 DV %HH$ IIHFWHG	($ 6HFWRQ1 XP EHUU 5 DWRQDOH IRU(OP IQDWRQ
1 DWYH$ P HUIFDQ &XOWXUDO&RQFHQV			[	
1 R[IRXV: HHGV ,QYDVLYH DQG1 RQ QDWYH6SHFLHV			[	
7 KUHDWHQHG DQG (QGDQJHUHG6SHFLHV 3DQWDQG$ QLP DOV			[	
: DWHUV + DJ DUGRXV RU 6RQG			[	
: DWHU4 XDOLW 6XUIFH* URXQGZ DWHU			[	
: HWODQGV5 LSDUDQ =RQHV			[	
: LOG DQG6FHQF 5 LYHUV	[			: RXOG QRWEHDIIHFWHG 1 R Z LOG DQG VFHQF UHYHUVRFFXULQ WKH + & &8 (3 RUYIFLQW
: LOGHQHVV: LOGHQHVV 6WG\ $ UHDV : 6$ V ODQGVRI Z LOGHQHVV FKDUDFWHUDWFV	[			: LOGHQHVRU: 6$ VDUHQRW SUHVHQWZ LWKLQ WKHSURMHFWDUHDRU YIFLQW 7 KH%/ 0 FRQGXFWHG D ODQGVZ LWKZ LOGHQHVV FKDUDFWHUDWFVLQYHQWRU RI WKH SURMHFWDUHDRQ6HSWHP EHU DQG GHWHUP LQHG WKHUHDUH QR ODQGVZ LWKZ LOGHQHVV FKDUDFWHUDWFVLQ WKHSURMHFW DUHD 7 KHVHHOP HQWDUHQRW IXUWKHUDQD0]HG LQ WKLV($: RXOG QRWEHDIIHFWHG 1 R Z LOGHQHVRFFXUVLQ WKH + & &8 (3 YIFLQW

7 DEOH 2 WKHU5 HVRXUFHVRI WKH+ XP DQ(QYLUQP HQW

2 WKHU5 HVRXUFHV	1 RW 3 UHVHQW	3 UHVHQW0 RV $ IIHFWHG	3 UHVHQW0 D\ %H$ IIHFWHG	($ 6HFWRQ1 XP EHUURU 5 DWRQDOH IRU(QP IQDWRQ
) LVK DQG: ILOGOLIH			[	
* UD]LQJ 0 DQDJHP HQW			[	
/ DQG8 VH$ XWKRU]DWRQ		[		: RXOG QRWHEHDIIHFWHG DFFRUGLQJ WR / 5 UHSRUWLFFHVWHG 2 FWREHU QR FKDQJHV DQWFLSDWHG
* HRORJ\		[		&DUUHG IRUZ DUG IRU IQIRUP DWRQDOSXUSRVHVDQG IRU VXSSRUWQJ UHDWHG UHVRXUFHV
1 RLVH			[	(IIHFWUHDWHG WKZ ILOGOLHDQDO]HG IQ
3 DOHRQWRORJ IFDO5 HVRXUFHV	[			: RXOG QRWEHDIIHFWHG QRVSUHVHQW
5 HFUHDWRQ			[	
6 RFLDODQG(FRQRP IF 9 DOXHV			[	
6 RLOV			[	
6 SHFLDO6 WDWXV3 OODQW 6 SHFLHV			[	
6 SHFLDO6 WDWXV) LVK DQG : ILOGOLH6 SHFLHV			[	
9 HJ HWDWRQ			[	
) RUHVW DQG: RRGODQG 5 HVRXUFHV			[	
9 LVXDO5 HVRXUFHV			[	
: ILOG+ RUVHVDQG %XUURV	[			: RXOG QRWEHDIIHFWHG + & &8 (3 LV RXWLGHWKHERXQGDUHVRI GHMJ QDWHG KHLGP DQDJ HP HQWDUHDV

* HRORJ\

7 KLV VHFWRQ GHVFUEHV WKHJ HRORJ IF UHVRXUFHV IRXQG Z LWKLQ WKHH[LVWQJ + & &8 (3 3DQ ERXQGDU * HRORJ IF UHVRXUFHV DUHSUHVHQWHG WK SURYLGHLQIRUP DWRQ RQ WKHSURWHFWHWQJ DQG VXSSRUWRWKHUUHVRXUFHDQDOVHV ,P SDFWWKJ HRORJ\ Z HUHQRWGHQWLIHG

* HRORJIF 6HWWQJ

7 KHUHJ IRQDOJ HRORJ\ RI WKH+ & &8 (3 DUHDLV VKRZ QLQ) LJXUH) LJXUH VKRZ VJ HRORJ IF FURVV VHFWRQVIQ WKH+ & &8 (3 DUHD

7 KHJ HRORJ\ IQ WKH+ & &8 (3 DUHDIQFOXGHVDUHDWYHO FRP SOH[VHGIP HQWDU VHTXHQFHRI 3 DOHR]RIF DJ HG URFNV 3 DOHR]RIF VHGIP HQWDU URFNVDUHWKHGRP IQDQWJ HRORJ IF IRUP DWRQV WKURXJKRXWWKHDUHDDQG KDYHXQGHJ RQHDKLWRU RI VHGIP HQWDWRQ DQG GHRUP DWRQ ' XUIQJ WKH HDU0 3 DOHR]RIF (UD FDWWF DQG FDUERQDWURFNVZ HUHGHSRVLWHG IQ DVKDOORZ P DUIQH

HQYLURQP HQWRQ WKHZ HVWLQ FRQWQHQWOP DJ ILQ RI 1 RUWK $ P HUFD 7 KHVHP DUQHFOWWF URFNV UH HUHG WR DV WKH: HVWLQ $ WHP EODJ H Z HUHGHSRVLWG ILQ WKHGHS Z DWUWK WKHZ HWZ KLOH FDUERQDWURFNV UH HUHG WR DV WKH(DWWLQ $ WHP EODJ H Z HUHGHSRVLWG ILQ WKHVKDOORZ Z DWUWK WKHHDW 6 WWZ DLW 7 KHIRUP DWRQVDWRFLDWG Z LWK WKH: HWWLQ $ WHP EODJ HDUH SUHGRP ILQDQW VLOLFHRXVZ LWK YHU OWWHFDUERQDW Z KLOHIRUP DWRQVDWRFLDWG Z LWK WKH(DWWLQ $ WHP EODJ HDUHSUHGRP ILQDQW FDUERQDW * ILOXX DQG 0 DXXUVN\

' XULQJ WKH/ DW' HYRQLDQ DQG (DUW 0 LWLWLSSLDQ J HROR JIF SHUIRGV VHGLP HQWV GHSRVLWRQ Z DVILQWUXSWG DQG WKH3 DOOR] RIF VHGLP HQWZ HUHXSOLWG IRO HG DQG LDXOWG GXULQJ DWWFWQIF HYHQWH HUHG WR DV WKH$ QWOPL2 URJ HQ 7 KH5 REHUW0 RXQWLQ7 KUXWWDV\ WWP RI OR DQJ OH WKUXWWDXOWZ KLFK FUHDWG P DWUGHRUP DWRQ RI WKH3 DOOR] RIF URFNV LV WKHP DLQ WWXFWXUDO H[SUHWLRQ RI WKH$ QWOPL2 URJ HQ 0 RYHP HQWOOR QJ WKH5 REHUW0 RXQWLQ7 KUXWWUHXOWG ILQ WKH GLVSOFHP HQWRI WKH: HWWLQ $ WHP EODJ HXS WR P ILOHVHDWZ DUG RYHUWKH(DWWLQ $ WHP EODJ H 6 WWZ DLW $ VDUHWXOWWKH: HWWLQ $ WHP EODJ HRFFXUVILQ WKHXSSHUSOWWRI WKHWKUXW Z KLOHWKH(DWWLQ $ WHP EODJ HRFFXUVILQ WKHOR Z HUSOWWRI WKHWKUXW* ILOXX DQG 0 DXXUVN\

: LWKLQ WKH(DWWLQ $ WHP EODJ H OR Z HUSOWW WKH2 UGRYIFLDQ DJ HGROR P LWWVDQG OP HWRQHVRI WKH+ DQVRQ &UHN) RUP DWRQ DUHWKHGHSHWWOILQJ XQLWRI ILQWUHWRYHOOILQ E\ 6ILXUDQ DJ H FOPDUHRXVVLOWWRQHVDQG GROR WRQHVRI WKH5 REHUW0 RXQWLQV) RUP DWRQ 7 KH' HYRQLDQ DJ H : HQEDQ) RUP DWRQ FRP SRVHG RI IP SXUHFDUERQDWURFNV RYHOOHVWKH5 REHUW0 RXQWLQV) RUP DWRQ 7 KH' HYRQLDQ DJ H+ RUVH&DQ RQ) RUP DWRQ RYHOOHVWKH: HQEDQ) RUP DWRQ DQG FRP SUVHVVLOFDWWF DQG FDOPDUHRXVFOWWF URFNV

7 KH2 UGRYIFLDQ DJ H9 ILQLQ) RUP DWRQ WKHWWDW UDSKIFDOO OR Z HWWP HP EHURI WKH: HWWLQ $ WHP EODJ H XSSHUSOWW XQFRQIRUP DEO RYHOOHVWKH+ RUVH&DQ RQ) RUP DWRQ

7 KHVWXFWXUDOOUFKLWFWXUHFUHDWG E\ WKH$ QWOPL2 URJ HQ DFFRP P RGDWG WKHHP SOLFHP HQWRI WKH-XUDWLF DJ HG 0 ILOO&DQ RQ WRFN DFRP SRVLWWRFN SUHGRP ILQDQW RI TXDUW]P RQJ RQLW FRP SRVLWRQ 7 KH0 ILOO&DQ RQ WRFN ILQWXGHVWKHOR Z HUSOWWFDUERQDW VHGLP HQWV URFNV SURYLGLQJ DGGLWRQDOJURXQG SUHSDUDWRQ DQG DOR RFDOKDWRXUFHIRUODWUP ILQHUDDJ ILQJ ILXLGV * ILOXX DQG 0 DXXUVN\ GHWFUEHVZ R SDUWRI WKHWWRFN DGLVFRGDQWUHFWDQJXDUWKDSH DOR QJ WKHZ HWWLQ OREHDQG DOOFFRDWLF RUE\ VP DOWWLF HDWWLQ OREH

7 HUWDU\ EDWDWOR Z V XS WR IHHWWKFN RFFXUILQ WKH&RUW] 0 RXQWLQV ' XULQJ WKHOWW 7 HUWDU\ DQG 4 XDWLQDU\ SHUIRGV FRQWQXDOXSOLWDQG HURVLRQ RI WKHP RXQWLQVKDYHSDWWDOO ILOHG WKHEDWLQVZ LWK XQFRQVRLGDWG WR SRRUO FRQVRLGDWG VLOWVDQG J UDYHO DQG ERXOHUV 7 KH ERXQGDU\ EHWZ HHQ WKHP RXQWLQVDQG WKHYDOOH\ P DU ILQVJ HQHUDOO LVFRYHUHG E\ FRDOWFILQJ DOXYDOILDQ GHSRVLW Z KHUHDVWKHFHQWLVRI WKHYDOOH\ VDUHGRP ILQWG E\ IICHUJ UDLQHG DOXYLXP GHSRVLWG E\ HSKHP HUDOWWHP VDQG ILQSOD DV 6 WWZ DLW $ OXYLDOVHGLP HQWILOOLQ WKH YDOOH\ VILQ QRUWK FHQWDO1 HYDGDWSIFDOO DUHWKRXVDQGVRI IHHWWKFN 7 KHDOXYLDOVHGLP HQWILQ 3 ILQH9 DOOH\ DUHH[SHFWG WR EH VP ILDUILQ WKFNQHVV %/ 0 E 7 KHJ HQHUDOO]HG WWDW UDSKIF VHTXHQFHRI WKH+ & &8 (3 DUHDLVXXP P DU]HG EHOR Z

Strategraphic Sequence

7 HUWDU\ 4 XDWUQDU\ DOXYLXP V 4 D ± $ OXYLDO FROXYLDO WUDFH SHGLP HQWDQG ODQGVOLGH GHSRVLW : HOYDQG(OORW * LOXO DQG0 DXXUN\

7 HUWDU\ EDVDOW7 E ± 7 HUWDU\ H[WXVLYHEDVDOWF DQGHMWMRYHO IQJ 7 HUWDU\ JUDYHOVDQG IRUP IQJ DFXHWWGLSSIQJ JHQW WR WKHVRXWKDW7 KHEDVDOWF DQGHMWMLVIQWXGHG DQG RYHODIQ E\ 7 HUWDU\ UK\ROWMSRUSK\U IQ VRP HORFDWRQV : HOYDQG(OORW * LOXO DQG0 DXXUN\

7 HUWDU\ VXIIVDQG JUDYHOV 7 WDQG7 J ± * UDYHOVRI GRP IQDQW XSSHUSODWOWRRU \ KDYIQJ YDUIEOHSHUFHQWJHVRI FOD\ DOWUHG YROFDQIFV Z IWK IQWUEHGGHG YDUIEO FOD\ DOWUHG VXIIV WKDW XQGHODHWKH7 HUWDU\ EDVDOW2 FFDVIRQDO SUHVHQWDWRUQHDUWKHVXUIFHZ KHUHWKHEDVDOWV DEVHQW

- XUDWLF TXDUWZ P RQJ RQIWM - TP ± 7 KH0 IOO&DQ RQ WRFN IVDFRP SRVLWWRFN Z IWK DQ RODHU SRUSK\UWF TXDUWZ SKDVH DP DJ QHWXWM EHDUIQJ SKDVH DQG DSKDQHUWF FRDUVH JUDQHG SKDVH 0 IQHUDOFRP SRVLWRQ FRQVLWVRI EIRWXWM IHOVSDUV DQG TXDUWZ Z IWK P IQRUP DJ QHWXWM 7 KH FRP SRVLWRQ RI WKH0 IOO&DQ RQ WRFN UDQJHVI URP TXDUWZ P RQJ RQIWMWR J UDQRGIRUWM

2 UGRYLFIDQ9 IQIQL) RUP DWRQ 2 YL ± 8 SSHUSODWXQIWZ IWK VHTXHQFHVRI VIOWWRQHDQG VKDOOH IQWUEHGGHG Z IWK IIQH J UDIQHG FKHLWVDQGWRQH DQG TXDUWLWWKDWDUHJ HQHUDOO H[WQVIYHO VKHDUHG FDUERQDFHRXVVIOFIFDWWFV * LOXO DQG0 DXXUN\

' HYRQIDQ+ RUVH&DQ RQ6 IOWWRQHV ' KF ± $ ORZ HUSODWXQIWFRQIWWQJ RI ODJ HO FDOFDUHRXVVIOWWRQHV Z KIFK DUHUHDGIO VIOFIIIHG WR WKHH[WQVWKDWWKH DSSHDUVP IODUWR VIOFIFDWWFVRI WKHXSSHUSODW ' KF IVDSUQFIS DOKRWWRI J RGIQ WKHSURWFWDUHD DQG IQ RWKHU P IQHVIQ WKHGIWUFWIQFXGIQJ WKH+ RUVH&DQ RQ DQG &RUWH + LOOVP IQHV) RXUXE XQIWDUH QRWG RI Z KIFK 8 QIW IVWKHP RWFRP P RQO REVHIYHG DQG IVDSUP DU J RGIKRW8 QIW IVD Z HDNO FDOFDUHRXV WKIQO SODQDUODP IQDWG VIOWWRQHEHWZ HHQ DQG IHHWWKIFN WKHORZ HU SRUWRQ RI Z KIFK FRP P RQO FRQWIQVWKIQ IQWUEHGVRI VIOFHRXVVIOWWRQH 7 KH+ RUVH &DQ RQ: HQEDQ FRQWFWVIQWUSUHWG WR EH WWXFXUDOEDVHG RQ RXWURS REVHIYDWRQVDQG GUIOO IQWUFHSW OINHO UHSUHVHQWQJ DP DWRUP RYHP HQVSODQHGXUIQJ WKH$ QWHL2 URJ HQ DQG VXEVHTXHQW0 HVR]RIF GHRUP DWRQ

' HYRQIDQ: HQEDQ/ IP HVWRQH ' Z ± 7 KH: HQEDQ/ IP HVWRQHIVDGDUN J UH WKIFN EHGGHG EIRFDWWF OP HVWRQHWKDWVIQWUEHGGHG Z IWK WKIQ EHGGHG DJ IOOFHRXVZ HDWHUIQJ VOEE\ OP HVWRQH * LOXO DQG0 DXXUN\ ' Z IVDQRWKHUSUP DU KRWWRI J RGIQ WKHSURWFWDUHD (IJ KWXE XQIWVRI WKH: HQEDQ/ IP HVWRQHKDYHEHHQ FKDUDFWUI]HG 2 I WKHVH WKHP RWWP SRUWMQW J RGIKRWWKRU]RQIV8 QIW DVHTXHQFHRI WKIQO OP IQDWG VIOW OP HVWRQHIQWUSHUVHG Z IWK VXUEIGIWWVGHEUVIORZ V (YIGHQFHIRUP IQHUDO]HG]RQHVGHSHUIQ WKH: HQEDQ VHFWRQ 8 QIW DQG IVREVHIYHG IQ VFDWWUHG GUIOOQJ EXWDYIOOEOHGDWDWKRVHGHSWKVDUHOP IWG

6 IOXUDQ5 REHUW0 RXQWIQV) RUP DWRQ 6 UP ± 7 KH5 REHUW0 RXQWIQV) RUP DWRQ IVD KRP RJ HQHRXV EODFN S\UUWF OP IQDWG VIOW J UDSWRQWF OP HVWRQHFRP SRVHG RI DSSUR[IP DWO SHUFHQWFDOFIWW SHUFHQWXDUW IIYHSHUFHQWSRWWXP IHOVSDU DQG OHVVWKDQ RQHSHUFHQW

P XVFRYLWL * LOOXO DQG0 DVXUXN\ ,WOHVFRQLRUP DEO EHORZ WKH: HQEDQ/ IP HVWRQH * LOOXO DQG0 DVXUXN\

2 UGRYLFLDQ+ DQVRQ &UHHN) RLP DWRQ 2 KF ±&RP SULVHG RI DQ XSSHUDQG OWZ HUIIQHJ UDLQHG GRORP LWMP HP EHUZ LWKDP LGGOHP HP EHUR VLOFHRXVOP HVWRQH OWZ HUGRORP LWMLVGLUN JUD\ WX EOLFN WKHP LGGOHOP HVWRQHLVP DVLYHDQG OJ KWJ UD\ DQG WKHXSSHUGRORP LWMLVP DVLYHDQG OJ KWJ UD\ Z LWK IRWLOVLQ WKHXSSHUP RWWEHGV * LOOXO DQG0 DVXUXN\

$ OWLUDWRQ DQG0 LQHUDOLWDWRQ

7 KHVZ R P DWUWSHVRI DOWLUDWRQ DUHVLOFLLIFDWRQ DQG DJ LOOLDWRQ $ OWLUDWRQ LQ WKH' Z 8 QLW LVGRP LQDWG E\ DWKLFN WXDWUP VLOFD VXOLGHEUHFFLD WX IHHW 7 KHEUHFFLD VKRZ V IHDWXUHVWSIFDORI FRODSVHEUHFFLDWRQ DQJ XOUFOWW J UDGHG FDYLW LLO HWV DQG FRP P RQ\ FRQWLQVFOWWRI P DIF GLNHP DWLUDO' HFDUERQLW\ DWRQ RFFXUVLQ OJ HSDWRI WKHP LGGOH' Z UHVXOWQJ LQ VRXWRQ FRODSVHDQG VXEVHTXHQWWWRQJ VLOFLLIFDWRQ &DUERQDWXQLWI UHTXHQW VKRZ VWRQJ GHFDUERQLW\ DWRQ DQG DJ LOOLDWRQ DERYHDQG EHORZ WKHEUHFFLD KRUL]RQ Z LWK UHP REIOLHG FDUERQ DQG IILQHJ UDLQHG VXOLGHVUHSOOFLQJ FDUERQDWP LQHUDOVZ LWK OWWOHRUQR UHSOOFHP HQWWLOFFDSUHVHQW

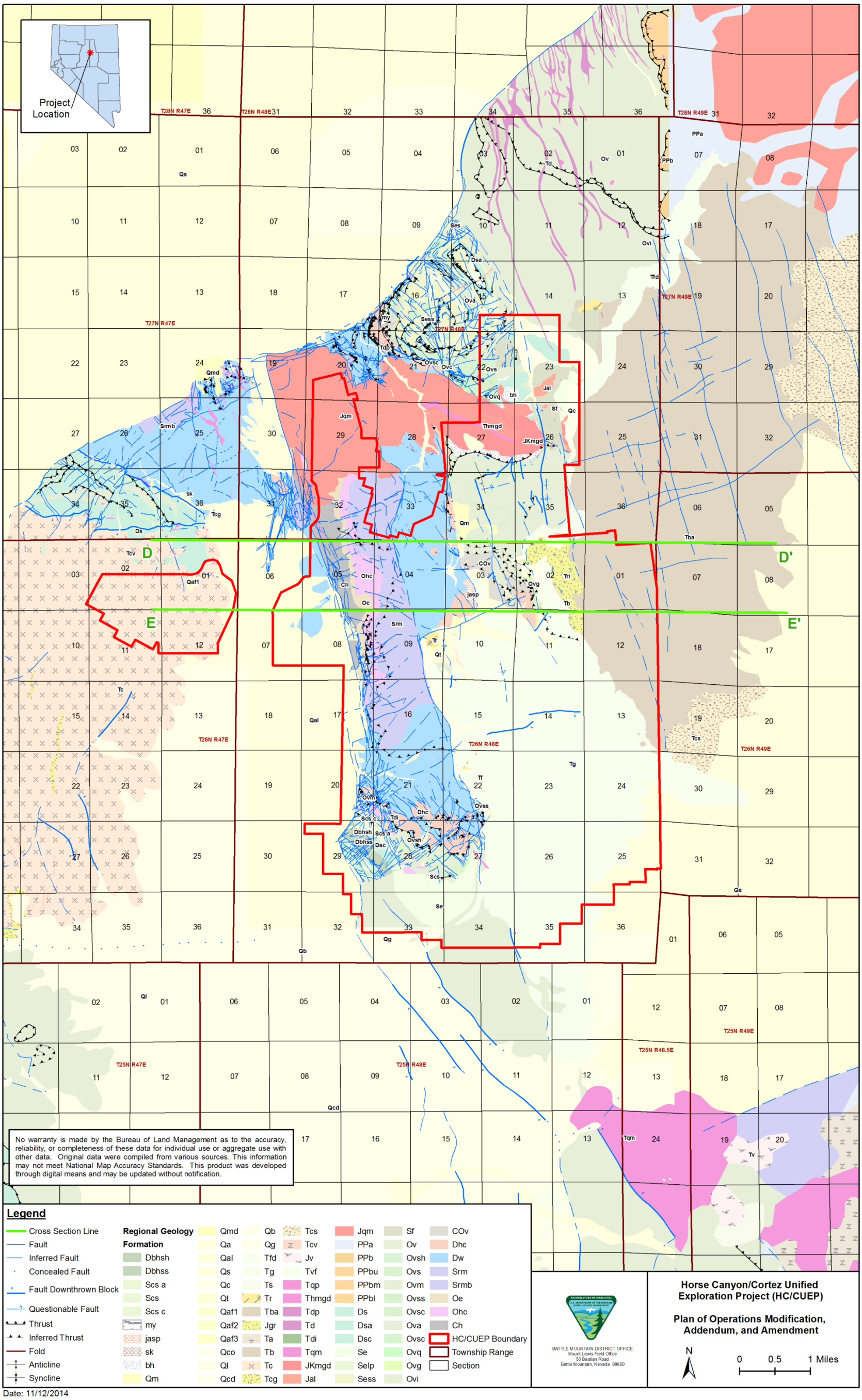
7 KHP LQHUDOLWDWRQ LVWSIFDO&DOLQ WWOH 7 KHEUHFFLD KRUL]RQ LQ WKH' Z 8 QLW LVYDULEO VXOLGL]HG VXOLGHHQUFKP HQWVSSHDVWX EHGLUHFW FRUHDWWEOHWX JRGJ UDGH 7 KH UHSOOFHP HQWWWOHLOWUDWRQ FDQ OREFDOO KRWWKJ K JUDGHJ RGG ! RXQFHWRQ SDUWFXOOO DW WKH+ RUVH&DQ RQ: HQEDQ FRQWFWDQG LQ WKHP LGGOH' Z

7 KHP LQHUDOUHVRXUFHVZ LWKLQ WKH+ &&8 (3 DUHDDQG WKHDGMFHQW HWVLQH9 DOOH\ 3QDQ RI 2 SHUDWRQV 1 9 1 DUHDDUHFRQHFWWYHO UHHUHG WX DVWKH%DUUFN* RGUXVK 3URMFW %DUUFN KDVGHLQHG WKHIRQOWZ LQJ P LQHUDOUHVRXUFHVIRUWKH%DUUFN* RGUXVK 3URMFWEDVHG RQ DJ RGSUFHRI SHURXQFH DVUHSRUWG LQ WKH%DUUFN $ QQXDO5 HSRUW

0 HDXUHG DQG,QGLFDWG P LQDRQ RXQFHV

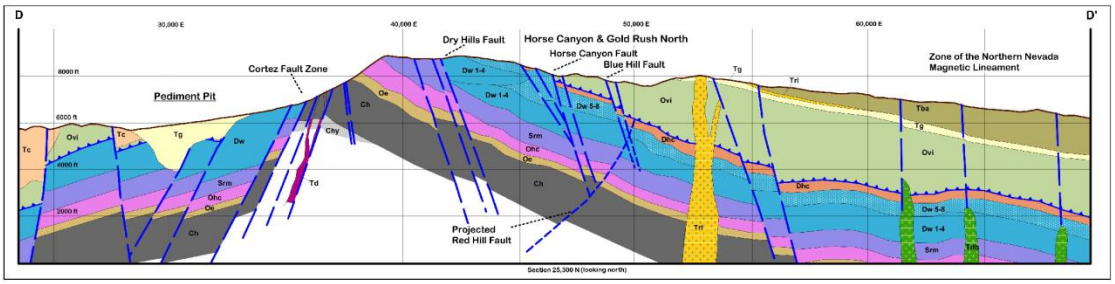
,QIHUUHG P LQDRQ RXQFHV

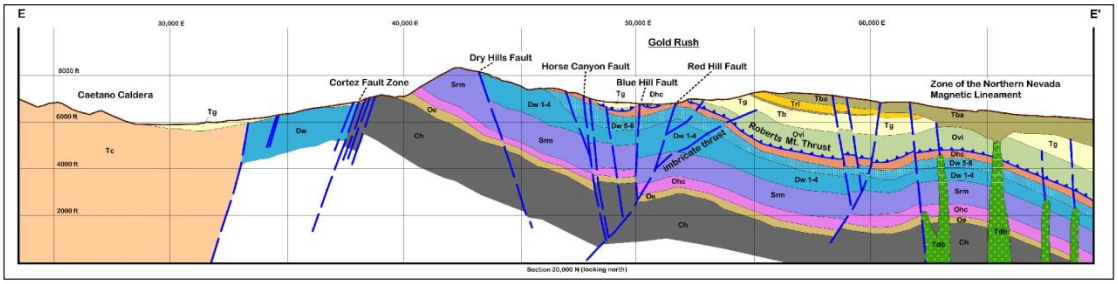
) LJXUH 5 HJLRQDO* HRORJ\



Date: 11/12/2014

) LJXUH * HRORJLF &URVV VHFWLRQV





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BATTLE MOUNTAIN DISTRICT OFFICE
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, Nevada 89820

Horse Canyon/Cortez Unified Exploration Project (HC/CUEP)

Plan of Operations Modification, Addendum, and Amendment

N

0 1 2 Miles

Date: 11/12/2014

: DWU5 HUXUFHV

7 KLVVHFWRQ GHVFUEHVWKHDIIHFWG HQYLURQP HQWRUFRQVLGHUDWRQ RI GLUHFWLQGLUHFWDQG FXP XODWYHIP SDFWVWR Z DWUHUXUFHV LQFOXGLQJ VXUDFHZ DWUHUXUFHV WWHP V VHHSVVSULQJ V DQG Z HWDQGV DQG J URXQGZ DWUHUXUFHV 7 KHDQDOVLVRI SRWHQWDOGLUHFW LQGLUHFWDQG FXP XODWYHIP SDFWVWR VXUDFHZ DWUHUXUFHVLQFOXGHVWKHHYDOXDWRQ RI Z DWU TXDOW DQG TXDQWW IRUVXUDFHZ DWUHDXUHVIRXQG Z LWLQ WKH+ & &8 (3 3 QQ ERXQGDU\ ) RU J URXQGZ DWU WKHGLUHFWLQGLUHFWDQG FXP XODWYHDQDOVLVDUHDLQFOXGHVWZR SUQFLSDO K\ GURJ HRORJ IF XQLW WKHEDVLQ ILOOXQLWDQG WKHFDUERQDWHEHGURFNORZ HUSODWXQLW

$ IIHFWG (QYLURQP HQW DWU5 HUXUFHV

7 KH+ & &8 (3 3 QQ ERXQGDU\ HQFRP SDVVHVSRWRQVRI WKH&UHHFHQV9 DOOH + \ GURJ UDSKIF $ UHD QXP EHU WKH3 ICH9 DOOH + \ GURJ UDSKIF $ UHD QXP EHU DQG WKH* UDW9 DOOH + \ GURJ UDSKIF $ UHD QXP EHU DVGHICHG E\ WKH1 ' : 5 **) IJXUH**

0 RXQW7 HQDER P DUNVWKHICWDUVHFWRQ RI WKHWHWUHHK\ GURJ UDSKIF DUHDV VHSDUDWQJ &UHHFHQW 9 DOOH WKWHQRUWK * UDW9 DOOH WKWHVRXWZ HWDQG 3 ICH9 DOOH WKWHDW%RWK WKH &UHHFHQV9 DOOH DQG 3 ICH9 DOOH K\ GURJ UDSKIF DUHDVDUHSDWRI WKH+ XP ERGWV LYHU5 HJ IRQ + \ GURJ UDSKIF 5 HJ IRQ * UDW9 DOOH LVSDWRI WKH&HQWDO5 HJ IRQ + \ GURJ UDSKIF 5 HJ IRQ 1 ' : 3

$ VIVWSIFDOLQ WKH%DWQ DQG 5 DQJ H3 URYLCFH WKH+ & &8 (3 DUHDIVGRP ICDWG E\ P RXQWWQ EORFN Z DWUVKHGVWKDWGUDQ RQWXEURDG DOXYIDOIDQVDQG YDOOH IICOV ' UDLQDJ HVIQ WKH + & &8 (3 DUHD DUHGHVFUEHG EHORZ DQG DUHVKRZ QRQ) **IJXUH**

7 KHQRUWKHQ SRUWRQ RI WKH+ & &8 (3 DUHD GUDLQVICWXU&UHHFHQV9 DOOH &DQ\ RQVIQ WKIVDUHD ICFXGH) RXP ICH&DQ\ RQ 0 ICO&DQ\ RQ &RUW] &DQ\ RQ DQG &RSSHU&DQ\ RQ &UHHFHQV9 DOOH IVERUGHUHG E\ WKH6 KRVKRQH5 DQJ HRQ WKHZ HWWWKH&RUW] 0 RXQWWQVDQG' U\ + ICOVRQ WKHHDW DQG QRUWKHDWDQG WKH7 RI\ DEH5 DQJ HRQ WKHVRXWK 7 KHQRUWKZ HWWQ SRUWRQ RI WKH YDOOH RSHQVXS WR WKHIORRGSODQ RI WKH+ XP ERGWV LYHU =RQHV 8 QFRQWRDIGDWG VHGIP HQW KDYHDFFXP XODWG IQ&UHHFHQV9 DOOH DVDUHXQWRI HURVIRQ DQG WDQVSRUWDWRQ RI VHGIP HQWURP P RXQWWQ WWHP V) OWZ YRXP HVIURP P RXQWWQ WWHP VGIP ICIVK UDSIGV GXHWR SHUFRODWRQ RI Z DWUICWR WKHDOXYIXP 7 KIVUHXXVIQ IHZ WWHP VUHFKIQ WKHYDOOH SOD\ DVH FHSVWGXUIQ KIJ K OHYHOVRI UXQRII =RQHV 5 XQRII IQ&UHHFHQV9 DOOH GRHVQRWGUDQ ICWR WKH+ XP ERGW 5 LYHUH FHSVWGXUIQ XQXVXDO KIJ K SUHFISIWWRQ HYHQW 8 QGHUJOWZ IURP &UHHFHQV9 DOOH WR WKH+ XP ERGWV LYHUIVEHOHYHG WR EHVP DOOQG OP IWG WR WKHH WWP HQRWKHQ SRWRQ RI WKH YDOOH =RQHV

7 KHHDWWQ VOPSHVRI WKH+ & &8 (3 DUHD GUDLQ ICWR 3 ICH9 DOOH Z IWK WKHSUIP DU\ GUDLQDJ HV EHQJ + RUVH&UHHN : ICOWZ &UHHN DQG WKHLUWIEXWUHV 3 ICH9 DOOH IVDVHP L HQFOVHG EDWQ WKDWVERXQGHG RQ WKHZ HWWE\ WKH&RUW] 0 RXQWWQV RQ WKHHDWE\ WKH6 XOXU6 SUIQJ VDQG 3 ICIRQ UDQJ HV DQG RQ WKHVRXWKE\ WKH6 IP SVRQ 3 DUN DQG 5 REHUWP RXQWWQV 5 XQRII ICWR 3 ICH 9 DOOH IVOWZ DQG P RWWRI 3 ICH&UHHNICVP DICWWQHG E\ J URXQGZ DWUGIVFKDJ HIURP VSUIQJ V (DNIQ 3 ICH&UHHNICWZ VQRUWK DQG GUDLQVICWR WKH+ XP ERGWV LYHU (DNIQ

7KHZHVWPLQDQG VRXWKHUQ VDRSHVRI WKH+&&8(3 DUHDGUDLQLQJ*UDW9DOOH\ *UDW9DOOH\ LV DFRVHGEDMQ ERWKWRSRJUDSKLFDOO DQGK\GURORJLFDOO (YHUHWWDQG5XVK 7KH7RI\DEH 5DQJHIRUP VLWZHVWPLQERXQGDU DQGWKH&RUWM0RXQWPLQVIRUP VLWQRUWKHLQERXQGDU $V ZLWK3LQH9DOOH\ DQG&UHVFHQW9DOOH\ P XFKRI WKHVWHP IORZ LQWR*UDW9DOOH\ LVDEVRUEHGE\ WKHDOXYLXP 1RWWHP VIURP WKH&RUWM0RXQWPLQVUHFKWKHSOD\DLQWKHYDOOH\ ERWWRP (YHUHWWDQG5XVK

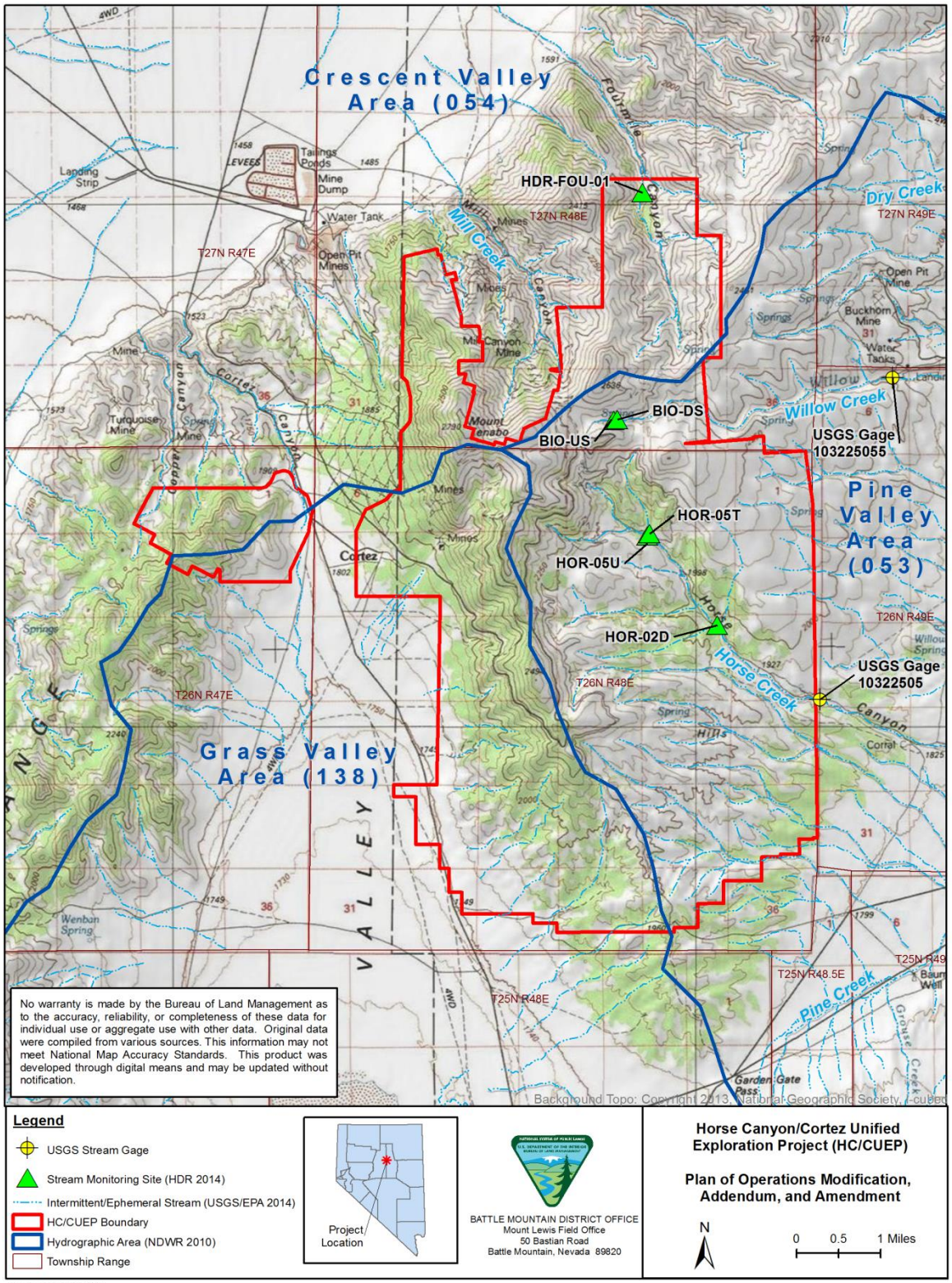
7KHTXDQWW RI VXUFHZDWHULQWKH+&&8(3 DUHDLVUHDWHO0P LWGGXHWRWKHORZ DQQXDO SUHFLSLWDWRQDQGWHGU FOP DWWDVURP RWWHHYDSRUDWRQ'DWDREWDLQHGIURP ,0/$ILU6FLHQFHLQGLFDWHVWKDVUHFLSLWDWRQDVRI WKHHQGRI2FWREHU LQWKH+RUVH&DQ RQDUHDLV ICFKHV ,0/$ILU6FLHQFH 0RQWKO SUHFLSLWDWRQDYHUDJHVIRU WKDWZHUH UHSRUWGLQWKH+'5(QJLQHHULQJ ,QF +'5 UHSRUW+'5 DUHIURP WKH&RUWM3LSHOLQH :HDWKHU6WDWRQ **7DEOH**)

7DEOH &RUWM3LSHOLQH:HDWKHU6WDWRQ3UHFLSLWDWRQ'DWD

0RQWK	**7RWDO 3UHFLSLWDWRQ ICFKHV**
-DQXDU	
)HEUXDU	
0DUFK	
$SULO	
0DY	
-XQH	
-XOY	
$XJXVW	
6HSWHPEHU	
2FWREHU	
1RYHPEHU	
'&HFHPEHU	

6RXUFH ,0/$ILU6FLHQFH

) LJXUH + \ GURJUDSKLF $ UHDVDQG 6WXGLHV



Date: 11/12/2014

Nevada 303(d) List

7KH1'(3IP SOHP HQWVWKH&OHDQ:DWHU$FW&: $ ILQ1HYDGD ZLWKRYHUVLJKWURP WKH(3$ (YHU WZR\HDUV 1HYDGDFRQGXFWVDFRP SUHKHQVLYHDQDO\VLVRI ZDWHUTXDOLW GDWDDVVRFLDWG ZLWK1HYDGDVVXUIDFHZDWHUVWRGHWHUPLQHZKHWKHUWKHVXUIDFHZDWHUTXDOLW WDQGDUGVDUH EHLQ PHWDQGGHWLJDWG XVHVDUHEHLQ VXSSRUWG 7KHDQDO\VLVOOWZDWHUVUHTXLUL D7RWDO 0DLP XP '(DLO/RDG 70'/ IRUYDUURXVSDUDP HWHUVZKLFKP D\ DGYHUVHO DIIHFWWKHKHDOWKRI WKHZDWHUG\ 7KHUHVXOWVRI WKHODWWWDQDO\VLVDUHFRP SLOHGLQWKH1HYDGD :DWH4XDOLW ,QWHUDWG5HSRUW1'(3 D ZKLFKZDVSUHSDUHGLQDFFRUGDQFHZLWKWKHUHTXLUP HQWVRI VHFWRQV G E RI WKH&: $ 7KHUHSRUWFRYHUVDQDWHWP HQWSHUURGRI2FWREHU WKURXJK6HSWP EHU &OWLIIHGZDWHUG\ VHJP HQWLQRUQHU+&&8(3DUH GHWFUEHGEHORZ

:ILORZ &UHHNLVFODWLIHGDV&DWJRU IRU P ILOHVIURP LWVRUJLQWR3ILQH&UHHN EHORZ WKH %XFNKRUQ0ILQH: DWHUG\,'19 +5 B 1'(3 D $ SRUWRQRI WKLVVHJP HQW ZKHUHWKHVWHDP RUJLQDWV LVORFDWGILQWKH+&&8(3DUHD $ &DWJRU GHWJQDWRQP HDQV WKDWDYDLODEOHGDWDILQGLFDWWKDWWKHDWWRQHGHWJQDWG XVHLVQRWEHLQ VXSSRUWG DQG D70'/ LVQHHGG 6SHFLIFDOO XVHIRUP XQIFLSDORUGRP HWWF VXSSO LVIP SDLUHG IRUWKLVVHJP HQWRI :ILORZ &UHHNGXHWRWRWDOGLWRYHG VRQLGV 7'6 OHYHOV 7KHUHLVDQ DWHWP HQWDP SOLQJ WDWRQ: & %8&. IRUZKLFK%DUUFNLVOWWG DVWKHVP SOLQJ DJHQF\

3ILQH&UHHNLVFODWLIHGDV&DWJRU IRUD P ILOHVHJP HQWURP LWVRUJLQWR WKHFRQIXHQFH ZLWK' U &UHHN: DWHUG\,'19 +5 B 1'(3 D 7KHKHDGZDWHUVRI WKLV VHJP HQWDUHORFDWG WR WKHVRXWKHDWWRI WKH+&&8(3DUHD +RUVH&UHHNIORZ VRXWRI WKH +&&8(3DUHDDQG ILQWR WKLVVHJP HQWRI3ILQH&UHHN 1RWWKDWWKLVVWH³' U &UHHN´ WKDWV ORFDWG ILQWKH6XSKXU6SULQJ V5DQJH DQG LVQRWWKH³' U &UHHN´ QHDUWKH+&&8(3DUHDWR WKH QRUWKRI WKH:ILORZ &UHHNGUDLQDJH $&DWJRU GHWJQDWRQP HDQVWKDWWKHUHLVIQXIIFLHQW IQIRUP DWRQRUGDWDUHODFNLQJ WR P DNHDGHWHUP IQDWRQDVWR ZKHWKHUWKHZDWHUG\ VXSSRUW DQ RI WKHEHQHIFLDOXVHV

Floodplains

7KH)HGHUDO(P HJHQF\ 0DQDJHP HQW$JHQF\ )(0$ P DSSHGWKHHQWLUHVWDVEHLQ ZLWLQD QRQ VKDGHG=RQH& 7KLV]RQHLVGHWFUEHGDV³DUHDVRI P IQLP DOIORRGLQJ´ 65.

6XUIDFH: DWHUV

6XUIDFHZDWHUUHDWUHVIQWKH+&&8(3DUHDKDYHEHHQIQYHQWRUHGDQG P RQLWRUHG DQGDUHSHDW P RQLWRULQJ DQG VDP SOLQJ SURJUP KDVEHHQGHYHORSHG $EDWHOQH VWXG\ UHSRUWFQWXWG *Horse Canyon/Cortez Unified Exploration Project 2013 Surface Water Baseline Study* ZDVFRP SOHWHG E\ +'5 +'5 7KHUHSRUWGRFXP HQWVWKHVWXG\ FRP SRQHQW VWXDP P RQLWRULQJ DQG VDP SOLQJ DVHS VSULQJ UHFRQDLVDQFH VXUYH\ VHS VSULQJ P RQLWRULQJ DQG VDP SOLQJ DQG ZHWDQG GHOLQHDWRQV 7KHFRP SOHWUHSRUWVIQFOXGHG IQWKHSURMHFWUHFRUG ,QIRUP DWRQ SUHVHQWG EHORZ IVVXP P DUL]HG IURP WKH +'5 UHSRUW

Streams

7 KHUHDUHQR SHUHQQLDOVWUHDP VZ LWKLQ WKH &&8 (3 DUHD 7 KUHHGUDLQDJHVRI &&8 (3 LQFOXGH VHJ P HQWVWKDW[KLEL WHDVRQDO LQWUP LWWQWLORZ &RUVH&UHHN : LORZ &UHHN DQG) RXUP LOH&DQ\RQ &' 5 ,QWUP LWWQWORZ VDUHIURP LVRODWG VSULQJ V DQG VKRUWWUP VHDVRQDOXQRII IURP VQRZ P HOWRUZ LQWUVWRUP V 0 DQ\ VP DOO HSKHP HUDOGUDLQDJHVDOVR RFFXU WKDWFRQYH LORZ IURP LQIUHTXHQWLQWQVHVWRUP HYHQW &' 5 / HQJWKVRI WKHSUP DU VWUHDP VWKDWRFFXUZ LWKLQ WKH &&8 (3 DUHDZ HUHP HDXUHG XVLQJ D* HRJ UDSKLF ,QIRUP DWRQ 6\ VWP *,6 &RUVH&UHHN P LOHV : LORZ &UHHN P LOHV DQG) RXUP LOH&DQ\RQ P LOHV

Barrick Stream Monitoring Stations

%DUULFN P DLQWLQVVL[VWUHDP P RQLWRULQJ VWDWRQV 6WUHDP VDQG VWDWRQ QRFDWRQVDUH VKRZ QLQ **7 DEOH &&8 (3 DQG DUHGLVSOD\HG RQ) LJXUH**

7 DEOH &&8 (3 6WUHDP 0 RQLWRULQJ 6WDWRQV

6LWH,'	*** URXS ' UDLQDJH**	**1 RUWKLQJ (DVWQJ**	**/ RFDWRQ' HVFUS WRQ**
&25 '	&RUVH&DQ\RQ		0 RXWKRI &RUVH&UHHN
&25 7	&RUVH&DQ\RQ		8 SVWUHDP RI FRQIOXHQFHZ LWK &RUVH &UHHN GRZ QVWUHDP RI URDG FURVVLQJ
&25 8	&RUVH&DQ\RQ		8 SVWUHDP RI WKHFRQIOXHQFHZ LWK &RUVH &UHHN WUEXWDU
%&2 86	: LORZ &UHHN		8 SVWUHDP RI : LORZ &UHHNEIRUHDFWRU
%&2 ' 6	: LORZ &UHHN		' RZ QVWUHDP RI : LORZ &UHHN EIRUHDFWRU
&' 5)28	) RXUP LOH&DQ\RQ		1 HDUP IGSRLQWORQ) RXUP LOH&UHHN DQGIP P HGLDWO XSVWUHDP RI WKH VHFRQGDU HWUEXWDU

6XUFHZ DWUP RQLWRULQJ DFWLWLHVDWHDFK %DUULFN VWUHDP P RQLWRULQJ VWDWRQ LQFOXGHG WKH IRORZ LQJ &' 5

- 6WUHDP IORZ P HDXUHP HQW
- ,Q-VLWX IIHOG Z DWUTXDOW SDUDP HWHUV
- * UDE VDP SOHIRUODERUDWRU DQDO\VLV
- 6LWSKRWRJ UDSKV
- ' RFXP HQWQJ QRWEOHFRQGLWRQVRUVJ QLIFDQWGLVXUEDQFH WR WKHDUHD

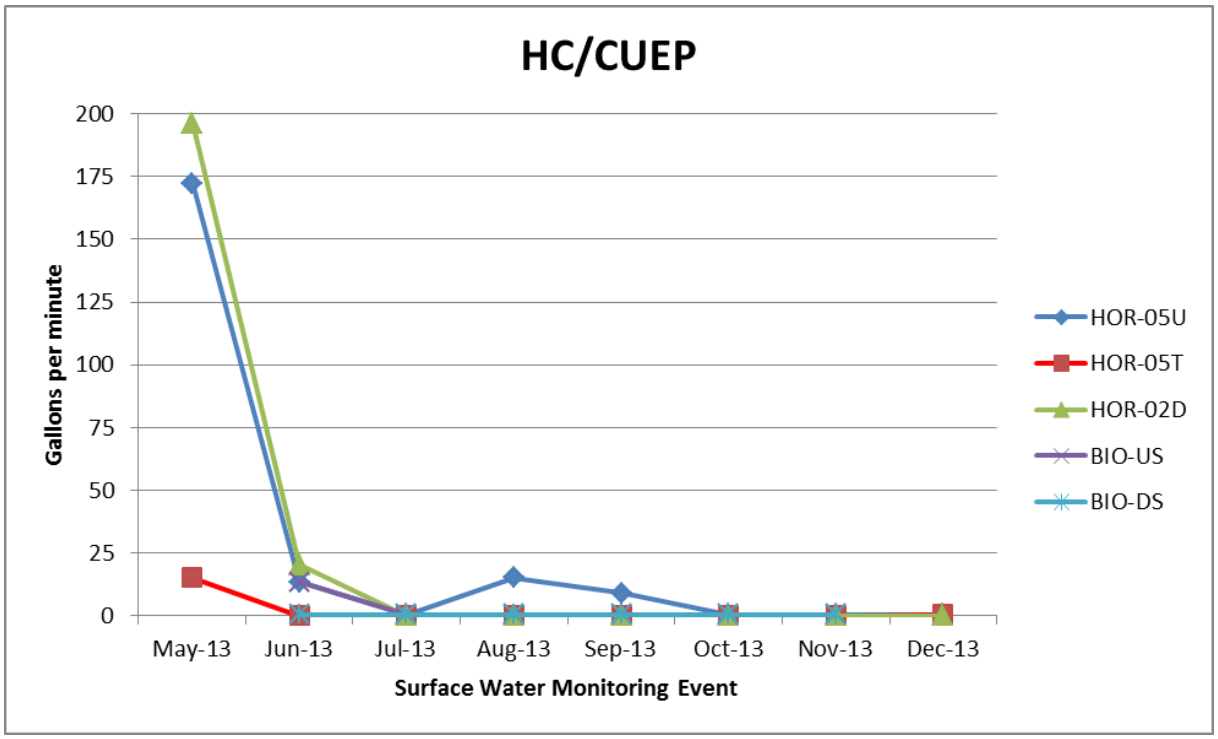
7 KHIRORZ LQJ LQ VLX IIHOG SDUDP HWHUVZ HUHFRORHFWG &' 5

- 7HP SHUDXUH GHJ UHHV&HOVLXV> &@
- ' LVROYHG R[\ J HQ P LOD J UDP VSHUDWXUH>P J / @

- S+ VWDQGDUG XQLWV>VX@
- &RQGXFWLYLW P IFURP KRVSHUFHQWP HWUL>3 KRVFP @
- 6DOLQLW
- 2 [LGDWLYH UHGXFWLRQ SRWHQWLDO P LOOLYROW>P 9 @
- 7' 6 P J /

0 HDVXUHP HQWV RI VXUEIGLW VWHDP YHORFLW FKDQQHOGIP HQWLRQ DQG GHSWK WX Z DWU P HDVXUHP HQW IRUYROXP HP HDVXUHP HQWDVFXEIF IHHWZ HUHDOR FRQHFWG Z KIFK DORZ VIRU IORZ FDOFXODWRQV 6WHDP IORZ VUHFRUGHGIQ DUHVKRZ QIQ) **IJXUH** IRUHDFK GUDLQDJ H JURXS ' XUIQJ WKH P RQLWRUIQJ +2 5 8 Z DVWKHRQ) ORFDWRQ WKDWW[KIEIWG IORZ GXUIQJ HYHU P RQLWRUIQJ HYHQW) RXUP IOH&DQ\RQ +' 5) 2 8 IORZ DQG VDP SOLQJ UHXXOWDUHQRW IQFOXGHG DVIWGIG QRWKDYHIORZ DWWKHWP HRI WKHP RQLWRUIQJ HYHQW

) IJXUH 6WHDP) ORZ



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GLVFRQWLQXHG IRUWKH6HSWHP EHU HYHQWDQG IXWXUHP RQLWRULQJ HYHQW 7KHUHXXOWVE\ GUDLQDJHJURXS DUHVXP P DUL]HG EHORZ +'5

+RUVH&UHHN*URXS

$COSK\VLFDOSDUDP HWHUVP HDVXUHG IRUWKHVDP SOHVFRQOHFWHG IURP WKH+RUVH&DQ\RQ VLWHZ LWKLQWKH1'(3UHHUHQFHYDOXHV ZLWKWKHH[FHSWRQVRI S+ OHYHOVLQ+25 '+25 8DQG+25 7+RZHYHUWKHOE DQGIIHOGS+ UHDGLQJVZ HUHQHYHUERWKRXWRI UDQJH HLWKHU EHORZ RUDERYHWKHUDQJH IRUWKHVDP HVDP SOLQJ SHUURG +'5

$COP DWUIRQV QXWLHQW DQG QRQ P HWDOVFRQFHQWDWRQVLQ VDP SOHVFRQOHFWHG IURP WKH+RUVH &DQ\RQ P RQLWRULQJ WDWRQVZ HUHUHSRUWHG ZLWKLQ1'(3UHHUHQFHYDOXHV 7KHFRQFHQWDWRQVRI GLVRONHG DUVHQLF ZHUHUHSRUWHG DERYHWKH1'(3UHHUHQFHYDOXHVIRUVDP SOHVFRQOHFWHG IURP +25 '+25 8DQG+25 7EXWWKLVIVFRQVLVWHQWZ LWKZ KDWKDVEHHQ KLVWRUICDOO UHSRUWHG IRUWKHVHORFDWRQVDQG UHSUHVHQWQDWXUDOO RFFXUULQJ EDFNJURXQG OHYHOV $COR WKHU FRQWXXHQWVRI GLVRONHG P HWDOVZ HUHUHSRUWHG ZLWKLQ1'(3UHHUHQFHYDOXHV +'5

,Q6HSWHP EHUDQG'HFHP EHU WKHVDP SOHVFRQOHFWHG IURP +25 8KDG UHSRUWHG WRWDO UHFRYHUDEOHDOXP LQXP FRQFHQWDWRQVRI DQG P J/ UHVSHFWLYHO) ZKIFK DUHDERYHWKH(3$ VHFRQGDU\ WDQGDUG IRUGULQNLQJ ZDWHUI P J/ 7KHVDP SOHVFRQOHFWHG IURP +25 8KDG UHSRUWHG WRWDOUHFRYHUDEOHLURQFRQFHQWDWRQVRI DQG P J/ UHVSHFWLYHO) ZKIFK DUHDERYHWKH(3$ VHFRQGDU\ WDQGDUG IRUGULQNLQJ ZDWHUI P J/ 7KHVDP SOHVFRQOHFWHG IURP +25 8KDG UHSRUWHG WRWDOUHFRYHUDEOHP DQJDQHVHFRQFHQWDWRQVRI DQG P J/ UHVSHFWLYHO) ZKIFK DUHDERYHWKH(3$ VHFRQGDU\ WDQGDUG IRUGULQNLQJ ZDWHUI P J/ $COR WKHUFRQWXXHQWVRI WRWDOUHFRYHUDEOHP HWDOVZ HUHUHSRUWHG EHORZ WKH(3$ VHFRQGDU\ WDQGDUGV 7RWDOUHFRYHUDEOHP HWDOVKDYHQRWEHHQ KLVWRUICDOO DQDO\]HG DWWKH+RUVH &DQ\RQ P RQLWRULQJ WDWRQV +'5

:LOORZ &UHHN*URXS

:DWUZ DVSUHVHQWDQG VDP SOHVZ HUHFROOHFWHG DW%2 86 DQG%2 '6 IRUP RVWRI WKH P RQLWRULQJ HYHQWVLQ 7KHVHVLWHVZ HUHQRW P RQLWRUHG GXULQJ ' HFHP EHUVLQFHWKH ZHUH QRWDFFHVVLEOH

7KHOHYHOVRI 7'6 UHSRUWHG DW%2 86 DQG%2 '6 H[FHHGHG WKH1'(3UHHUHQFHYDOXHRI P J/ IRUWKHP DWUW RI WKHP RQLWRULQJ HYHQWVLQ 7KLVIVFRQVLWWQWZ LWKZ KDWZ DV UHSRUWHG IRUHDFK RI WKHVHORFDWRQVLQ 7KHKJKHWOHYHOVRI 7'6 ZHUHUHSRUWHG IQ 1RYHP EHU ZLWK%2 86 DW P J/ DQG%2 '6 DW P J/ $COR WKHUSK\VLFDO SDUDP HWHUVP HDVXUHG ZHUHZ LWKLQ1'(3UHHUHQFHYDOXHV

&RQGXFWLYLW DQG7'6 P HDVXUHG DWWKH%2 86 DQG%2 '6 P RQLWRULQJ WDWRQVZ HUHKJKHU WKDQ ZKDWZ DVUHFRUGHG DWRWKHUP RQLWRULQJ WDWRQV 7KHKJKHWFRQGXFWLYLW UHGLQJVZ HUH P HDVXUHG IQ1RYHP EHU ZLWK%2 86 DW 3KRVFP DQG%2 '6 DW 3KRVFP 7KHUHP DIQLQJ SDUDP HWHUVZ HUHFRQVLWWQWZ LWKZ KDWZ DVP HDVXUHG DWRWKHUWDWRQVGXULQJ WKH P RQLWRULQJ SURJUDP

6WUHDP IORZ DW%,2 86ZDV JDXJHRQVSHUPLQXWJSP LQ-XQH)ORZ VDW%,2 86 DQG%,2 '6ZHUHQRWP HDVXUDEOHIRUWKHUP DLQLQJ HYHQW EXWHQRXJKZ DWUZ DVSUHVHQW WR VDP SOHWKHVHORFDWRQVZ KHQ WKHVWUHDPVZ HUHDFFHVVLEOH

0DJQHWXP OHYHOVUHSRUWGIRUDOOP RQLWRULQJ HYHQWVLQ DW%,2 86DQG%,2 '6ZHUH VDJKW DERYHWKH1'(3UHHUHQFHOHYHORI P J/ 6XDDWOHYHOVUHSRUWGIRUDOOP RQLWRULQJ HYHQWVLQ DW%,2 86DQG%,2 '6ZHUHDERYHWKH1'(3UHHUHQFHOHYHORI P J/ EXW DUHFRQLVWQWZ LWKKLWRUF OHYHOV

7KH%,2 86DQG%,2 '6WDWRQVZ HUHDOR P RQLWRUHGIRU: $' F\DQLGHGXUQJ WKH-XQH -XO DQG$XJXW P RQLWRULQJ HYHQW 7KHOHYHORI: $' F\DQLGHUHSRUWGGLGQRWH[FHHG1'(3 3URILOH, UHHUHQFHYDOXHV

7KHFRQFHQWDWRQVRI GLVRONHG DUVHQLF ZHUHUHSRUWGDERYHWKH1'(3UHHUHQFHYDOXHVIRU VDP SOHVFRONHFWGIURP %,2 '6IQ$XJXWDQG6HSWP EHU EXWWKLVLVFRQVWWQWZ LWKZKDW KDVEHHQKLWRUFDOO UHSRUWGIRUWKLVORFDWRQDQG UHSUHHQWVQDWXUDO RFFXUULQJ EDFNJURXQG OHYHOV $ COORWKHUFRQWWXHQWRI GLVRONHG P HWDOVZ HUHUHSRUWGZ LWKLQ1'(3UHHUHQFHYDOXHV &RQFHQWDWRQVRI WRWDOUHFRYHUDEOHDOXP LQXP ZHUHUHSRUWGDW P J/ IQWKHVDP SOH FRONHFWGIURP %,2 86IQ6HSWP EHU DERYHWKH(3$ VHFRQGDU\ WWDQGDUG IRUGULQNLQJ ZDWURI P J/ 7RWDOUHFRYHUDEOHILURQFRQHQWDWRQVIQ VDP SOHVFRONHFWGIURP %,2 86 ZHUHUHSRUWGDW P J/ DQG P J/ IQ6HSWP EHUDQG2FWREHU DERYHWKH(3$ VHFRQGDU\ WWDQGDUG IRUGULQNLQJ ZDWURI P J/ 7RWDOUHFRYHUDEOHP DQJDQHVH FRQHQWDWRQVZ HUHVDJKW DERYHWKH(3$ VHFRQGDU\ WWDQGDUGVIQ VDP SOHVFRONHFWGIURP %,2 86DQG%,2 '6IQ6HSWP EHU2FWREHU DQG1RYHP EHU $COORWKHUFRQWWXHQWRI WRWDOUHFRYHUDEOHP HWDOVZ HUHUHSRUWGEHORZ WKH(3$ VHFRQGDU\ WWDQGDUGV7RWDOUHFRYHUDEOH P HWDOVKDYHQRWEHHQKLWRUFDOO DQDO]HGDWWKH: ICORZ &UHHNP RQLWRULQJ WWDWRQV

USGS Stream Monitoring Stations

86*6 WWHDP JDXJHVZ HUHICQWWOOHGIQ$SUIO RQ: ICORZ &UHHNDQG+RUVH&UHHN **) LJXUH**) 7KH DUHIGHQWWIHGDV86*6 6IWW1XP EHU : ICORZ &UHHNDW$COOWRQ5DQFK DQG86*6 6IWW1XP EHU +RUVH&UHHNDW+RUVH&DQ RQ 86*6 0HDXUHP HQWVIURP WKH86*6 WWHDP JDXJHVICFXGHJDJHKHJKWDQGGLVFKDUJH FXEIF IHHWSHU VHFRQG DQGDUHUHFRUGHGFRQWQXRXVO ' DWDDUHDYDLDEOHWR WKHSXEOF DWWKH86*6 ZHEVLWW

Seeps, Springs, and Wetlands

: HWDQGVDUHDUHDVZ KHUHVDXUDWRQE\ ZDWUVWKHGRP IQDQWDFWRUFRQWRONQJ VRLO GHYHORSP HQWDQG WKHYHJHWDWRQJURZ IQJ DWWKHVWW &RZ DUGIQHWDO 6HHS VSUIQJ IHDXUHV ZHUHHYDXDWGIRUWKHWKUHFUWWUDWWDWGHIQHDZ HWDQG VRIOV YHJHWDWRQ DQGK\GURORJ\ DV UHJXDWGE\ WKH&: $ 6HHSVDQG VSUIQJ VWKDWP HWWKHZ HWDQGFUWWUDZ HUHDGGHG WR WKH VHHS VSUIQJ DQQXDOP RQLWRULQJ DQG VDP SOIQJ SURJUDP +'5

$ WRWDORI VHHS VSUIQJ IHDXUHVZ HUHP RQLWRUHGIQ WR GHWWUP IQHZ HWDQG WWDXV 2I WKHVH DWRWDORI VHHS VSUIQJ IHDXUHVZ HUHIGHQWIHGDVZ HWDQGV +'5 7KHIHDXUHV KDYHEHQRU DQ]HGIQWR WKHIROORZ IQJ JURXSVEDVHGRQZ DWUVKHGVDQGJHRJ UDSKIF IHDXUHV ' U\ +IOOV QIQHVHS VSUIQJ VIWW) RXUP IOH&DQ RQ WKUHHVHS VSUIQJ VIWW +RUVH&UHHN

VHHS VSULQJ VLWHV 0 ILOO&DQ\RQ VWRR VHHS VSULQJ VLWHV 1RUWK7RL\DEH5DQJH: HWWRQH VHHS VSULQJ VLWH :ILOORZ &UHHN VHHS VSULQJ VLWHV DQG:ILOORZ 6SULQJV VWRR VHHS VSULQJ VLWHV 6HHS DQG VSULQJ VLP SOLQJ VLWHVDUHDWWDFKHG$ **SSHQGL&7DEOH%** 2I WKH VHHS VSULQJ IHDXUHV WKHUHP DLQLQJ ZHUHGHWHUP ILQHG WRQRWEHZ HWDQGV DQG ZHUHQRW ILQFOXGHG ILQ WKHVLP SOLQJ SURJUDP

,Q6HSWHP EHU WKH VHHS VSULQJ IHDXUHVZHUHP RQLWRUHG DQG VLP SOHG :KHQ VXIIFLHQW ZDWHUZDVSUHVHQWWKHIRORORZ ILQJ GDWDZHUHFRORHFWHG

- 6SULQJ IORZ P HDXUHP HQW ILZDWHUZDVSUHVHQW
- ,Q-VLXIIHOG ZDWHUTXDOW SDUDP HWHUV GHWHUHGEHORZ ILZDWHUZDVSUHVHQW
- * UDE VLP SOHIRUODERUDWRU DQDOVLV ILZDWHUZDVSUHVHQW
- 6LWHSKRWRJUDSKV
- ' RFXP HQWDWRQRI GRP ILQDQWYHJHWDWRQ WKHSUHVHQFHRI QR[IRXVDQG ILQYDVLYHSODQW VSHFLHV DQG DQ\ QRWEOHFRQGLWRQVRUVJQLIFDQWGLVXUEDQFHWR WKHDUHD

7KHIRORORZ ILQJ ILQ VLXIIHOG SDUDP HWHUVZHUHFRORHFWHG +'5

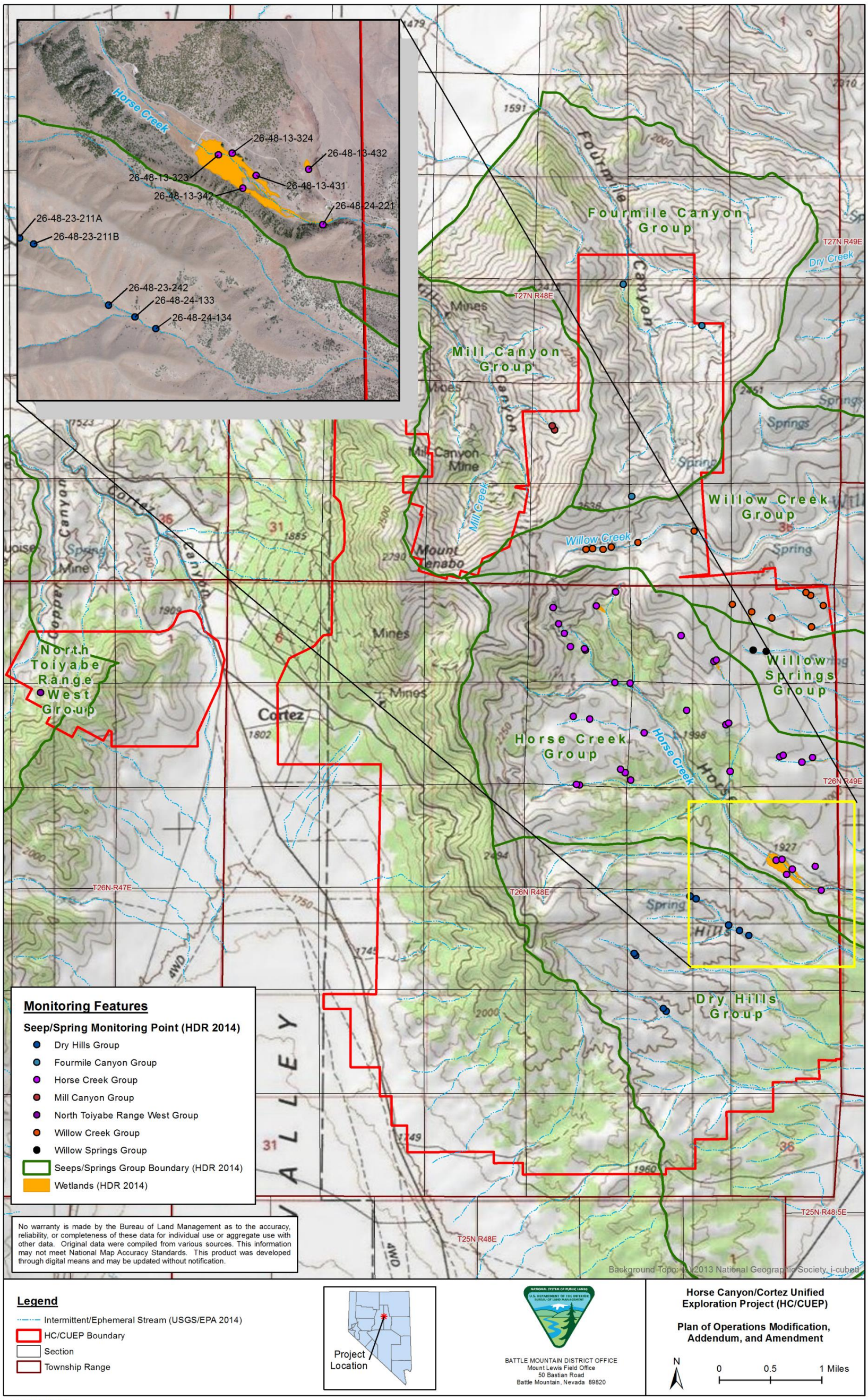
- 7HP SHUDXUH &
- ' LVRONHG R[\JHQ P J /
- S+ VX
- &RQGXFWLYLW 3KRVFP
- 6DOLQLW
- 2[IGDWLYHUHGXFWRQ SRWHQWLDO P 9
- 7'6 P J /
- 1'(3 3URILOH,,

7XUEIGLW WHUP YHORFLW FKDQQHOGP HQVLRQ DQG GHSWK WR ZDWUP HDXUHP HQW IRUYROXP H P HDXUHP HQWDVFXEIF IHHWZ HUHDOR FRORHFWHG ZKIFK DORRZ HG IRUILORZ FDOFXODWRQV

: HWDQG DUHDVDWRFIDWHG ZLWK VHHS VSULQJ IHDXUHVP D\ ILQFOXGHP XOWSOHVHSV VSULQJ VWKDWDUH DFFRXQWHG IRUILQGLYLGXDOO ILQ WKHVHS VSULQJ VLP SOLQJ SURJUDP **$ SSHQGL&7DEOH%** SUHVHQWVDWWEOHIRI WKH ZHDQG DUHDV DWRFIDWHG ZLWK WKH VHHS VSULQJ IHDXUHV IGHQWLIHG ILQ WKH+&&8(3 DUHDDQG DWRFIDWHG DFUHDJHV +'5 : HWDQGVWKDWFQXGHP RUHWKDQ RQH VHHS VSULQJ ORFDWRQ DUHILQGIFDWHG ILQ**$ SSHQGL&7DEOH%** E\ ILQFOXGLQJ P XOWSOHVLW IGHQWIFDWRQ QXP EHUVZ LWKQ DZ HWDQG IHDXUH

) LJXUH GLVSOD\VWKHVHS VSULQJ IHDXUHVDQG WKHZ HWDQG DUHDVGHOLQHDWHG ILQ WKH+&&8(3 DUHD

) LJXUH 0 RQLWRULQJ / RFDWRQVIRU6HHSV6SULQJVDQG: HWODQGV



Date: 11/12/2014

* URXQGZ DWHU

3 UHFLSLWDWRQ LQ WKHP RXQWDLQ UDQJHV DQG SHGLP HQWV WKDW GRHV QRW P HGLDWH) HYDSRUDWHLWKHU LQLOWDWHV GLUHFW9 LQWR EHGURFN SUIP DUH) WKURXJK IUDFWXUHV RUIVFRQYH HG E\ VWHDP VWRQHU HDHYDWRQVZ KHUH WKHZ DWHUSHUFRODWHVLQWR WKHDQXYLDOLDQV %DVLQ ZIGHJ URXQGZ DWHUUHFKDUJ H UDWHVIRU&UHFHQV9 DQDO\ DUHHVWP DWG WX DYHUDJ HDSSUR[IP DWH) LQFKHV\ HDU * HRP HJ D) RUWKHVRXWKLQ SRUWRQ RI 3 LQH9 DQDO\ LQFOXGHG LQ WKH0 RXQW+ RSH6 WXG\ $ UHD JURXQGZ DWHUUHFKDUJ HUDWHVDUHHVWP DWG WX DYHUDJ HDSSUR[IP DWH) LQFKHV\ HDU %/ 0 E ,QZ HVWHLQ3 LQH9 DQDO\ JURXQGZ DWHULQ WKHP RXQWDLQ DQG DQXYLDOLDQ DUHDVJ HQHUDOO) IORZ VWX WKHHDWWRXWKDWWDQG WKHQ HYHQWXDOO) WXLQVQRUWZ DUG IRORZ IQJ WKH3 LQH&UHN GUDLQDJ HWRZ DUG WKH+ XP ERORW7 LYHU

3 LQH9 DQDO\ DQG &UHFHQV9 DQDO\ DUHGHMJ QDWG JURXQGZ DWHUZ DWHUEDWLQV DOR UHHUHG WX DV $ GP IQLWWHG* URXQGZ DWHU%DWLQV DFFRUGLQJ WX WKH6 WDWH(QJ IQHHU ,QWHVHEDWLQV SHUP LWWG Z DWHUXVHLVHTXDOWX RUH[FHHGV WKHHWWP DWG DYHUDJ HDQQXDOUFKDJ HRURWKHZ LVHUHTXLUHV DGGLWRQDODGP IQLWWDWRQ

7 KHUHDUHW7 R SUIQFLSDOK\ GURJ HRORJ IF XQLWVLQ WKH+ & &8 (3 DUHD WKHEDWQ IILOOXQLWVQG WKH FDUERQDWHEHGURFN OR Z HUSODWXQLW7 KHEDWQ IILOOK\ GURJ HRORJ IF XQLWVVFRP SUIVHG RI WKH DOXYLDO FRORXYLDO WWUDFH SHGLP HQWVDQG ODQGVOLGHGHSRVLWZ KIFK FRP SUIVHWKH7 HWDU\ 4 XDWHUQDU\ DOXYLXP V 4 D WKH7 HWDU\ EDVDOW7 E WKHJ UDYHOVRI GRP IQDQW XSSHUSODW OWRORJ \ KDYIQJ YDUIEOHSHUFHQWJ HVRI FOD\ DOWHG YRORDQIFV 7 J DQG WKHIQWHEHGGHG YDUIEO) FOD\ DOWHG VXIIV 7 W

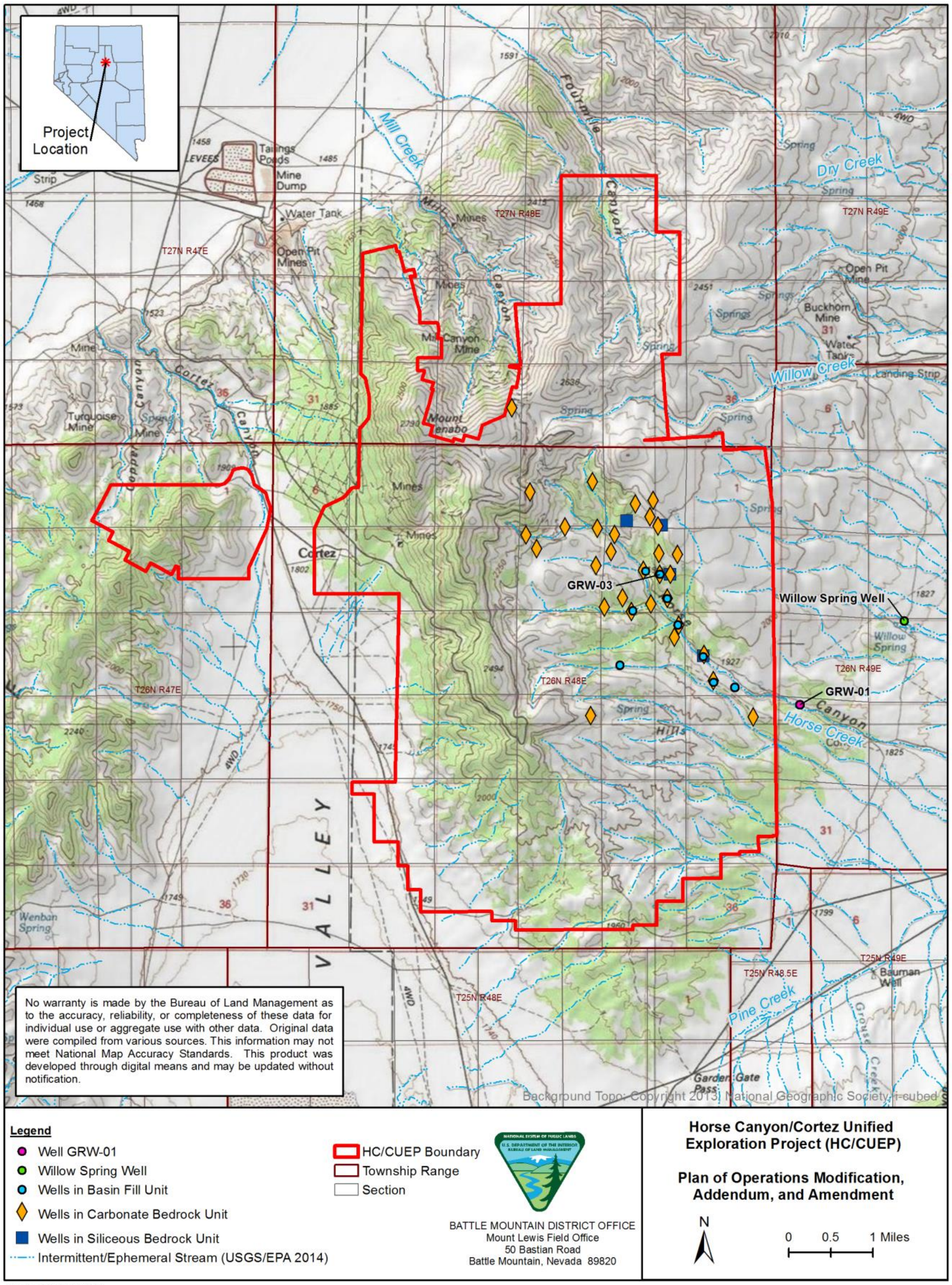
7 KHFDUERQDWHEHGURFN OR Z HUSODWK\ GURJ HRORJ IF XQLWVVFRP SUIVHG RI WKH' HYRQIDQ+ RUVH &DQ\ RQ0 HP EHU ' KF Z KIFK FRQVWVRI ODJ HV) FDOPDUHRXVVLOWRQHV WKH' HYRQIDQ: HQEDQ / IP HWRQH ' Z Z KIFK IVDGDUN JUH WKIFN EHGGHG EIRFODWWF OP HWRQH WKDWVIQWHEHGGHG Z IWK WKIQ EHGGHG DUJ ICODFHRXVZ HDWHUIQJ VDEE\ OP HWRQH WKH6 ICXUDQ5 REHIW0 RXQWQV) RUP DWRQ 6 UP Z KIFK IVDKRP RJ HQHRXV EODFN S\ UUWF OP IQDWG VICW JUDSWRDWF OP HWRQH DQG WKH2 UGRYIFIDQ+ DQWRQ &UHN) RUP DWRQ 2 KF Z KIFK IVIICH JUDICHG P DWVIYHGROP IWW Z IWK VICDFHRXVOP HWRQH

7 KHUHIVDOR DVICDFHRXVEHGURFN XSSHUSODWK\ GURJ HRORJ IF XQLWVQ WKH+ & &8 (3 DUHD FRP SUIVHG RI WKH2 UGRYIFIDQ9 ICICL) RUP DWRQ 2 YL Z KIFK FRQWVQV VHTXHQFHVRI VICWWRQHDQG VKDOHICWWEHGGHG Z IWK IICH JUDICHG FKHVVDQGWRQH DQG TXDUWVLWWKDWDUHJ HQHUDOO) H[WQVIYHO VKHDUHG FDUERQDFHRXVVICDFIFDWWFV

Groundwater Monitoring

* URXQGZ DWHUP RQIWRUIQJ Z HOVDQG SIH]RP HWHVZ IWKIQ WKH+ & &8 (3 DUHD DUHVKRZ QRQ) **IJXUH** 7 KHFRRUGLQDWWVDQG VFUHQHG IQWHYDOVRI WKHP RQIWRUIQJ Z HOVDQG SIH]RP HWHVDUHVKRZ Q IQ$ **SSHQGIL & 7 DEOH%**

)LJXUH *URXQGZDWHU0RQLWRULQJ:HOOVDQG3LH]RPHWHUV



Date: 11/12/2014

:LWKLQWKH+&&8(3DUHDWKHUHDUH JURXQGZDWHUSRQLWRULQJZHOOVSLHFRPHWLVLQWKHEDVLQ ILOOXQLW,QWKLVXQLWWKHUHLVDJUDGLHQWIURP WKHKLJKHUHOHYDWRQVWRZDUGVWKHORZHUORXWH VRXWKHDW7KHZDWHUORYHOVYDU IURP WR IHHWZLWKDK\GUDXOLF JUDGLHQWRI DSSUR[LPDWHO IRRW IRRW

,QWKHFDUERQDWHGURFNORZ HUSODWXQLWWKHUHDUH JURXQGZDWHUSRQLWRULQJ ZHOOVSLHFRPHWLV 7KHUHLVDUHDWYHO ILOVSKUHDWF VXUIFHZLWKLQWKHFDUERQDWXQLW7KH JURXQGZDWHUHOHYDWRQ DVRI -XQH IVDWSSUR[LPDWHO IHHW7KHUHKDVEHHQ DKHDG UHGXFWRQ LQWKHFDUERQDWHGURFN XQLWZ KIFK KDVFRUUHVSRQGHG WR Z DWHUOHYHOGHFOLQHV PHDVXUHG LQWKHP RQLWRULQJ ZHOVDQG SLHFRPHWLV WKHFXUUHQWGHFOLQHVLQWKH+&&8(3DUHD UDQJHIURP WR IHHW HDU 7KHKHDG UHGXFWRQ LVP RWWDNHO DUHXOWRI JURXQGZDWU SXP SLQJ DWWKH3LSHOLQHDQG&RUW] +LOOVP LQLQJ RSHUDWRQVLQ&UHFHQW9DOOH\ 7KHUHKDVEHHQ QR FRUUHVSRQGLQJ KHDG UHGXFWRQ LQ WKHRYHO0LQJ EDVLQ ILOOXQLW

7KHUHDUHIRXUJURXQGZDWUP RQLWRULQJ ZHOVSLHFRPHWLVLQWKHVLOLFHRXVEHGURFNXSSHUSODWW XQLW7KHUHLVDJUDGLHQWWRZ DUGVWKHVRXWKHDWWLQZ KIFK WKHZ DWUOHYHOVYDU IURP IHHWWR IHHWZ LWKDK\GUDXOLF JUDGLHQWRI DSSUR[LPDWHO IRRW IRRW

Hydraulic Conductivity

7KHK\GUDXOLF FRQGXFWLYLW . RI WKHEDVLQ ILOOP DWUDOVLVSDUW GHSHQGHQWRQ WKHJHRORJ\ RI WKHHURGHG VRXUFHP DWUDORI Z KIFK LWLVFRP SRVHG DVZ HOODVWKHSURSRUWRQ RI IILQHV GHJ UHHRI VRUWQJ FHP HQWDWRQ DQG FRQVROLGDWRQ %DUUFN FRQGXFWG VKRUWWUP K\GURORJ IF WWHVWWWRQ WZR DUWWDQ Z HOVFRP SOHWG LQ WKHEDVLQ ILOOGHSRVLWLQ WKHDGMFHQW HWVLQH9 DOOH\ 3DQRI 2SHUDWRQV 1 9 1 DUHD 7KHIILUWWWWZ DVDQ HJ KWKRXUORZ DQG VKXWLQ WWW SHJRUP HG RQ WKH: ILOORZ 6SUQJ VZ HOO Z KIFK LVORFDWG DERXW IHHWURP WKHHDWWLQ HGJ H RI WKH+&&8(3 3DQ ERXQGDU 7KHVHFRQG WWWZ DVDILYH GD SXP SLQJ WWWRI Z HOO* 5: Z KIFK LVORFDWG QHDUWKHHDWWLQ HGJ HRI WKH+&&8(3 3DQ ERXQGDU 7KHORFDWRQVRI WKHWH WZR Z HOVDUHVKRZ QRQ) **LJXUH**

$ YDOXHRI IHHWGD Z DVFDOFXODWG IRUWKH: ILORZ 6SUQJ VWWW,WWFD +\GUDXOLF FRQGXFWLYLW YDOXHVRI WKLVRUGHURI P DJQLWXGHKDYHEHHQ UHSRUWG IRUSHUP HDEOHEDVDOWQG IRU JUDYHO DVZ HOODVIRUNDLWWF DQG IUFWXUHG OP HWWRQH ' RP HQIFR DQG 6FKZ DUW 6SLW DQG 0 RUHQR

$ YDOXHRI RQ WR IHHWGD Z DVFDOFXODWG IRUWKHZ HOO* 5: WWW,WWFD 7KHWHHWP DWG YDOXHVDUHWZR RUGHUVRI P DJQLWXGHOHVVWKDQ WKHHWP DWG YDOXHGHUYHG IURP WKH: ILORZ 6SUQJ VZ HOOWWWEXWWKH DUHZ LWKLQ WKHUHSRUWG UDQJHVIRUSHUP HDEOHEDVDOW WR IHHWGD DQG IRUVDQG DQG VLOW VDQG WR IHHWGD 6SLW DQG 0 RUHQR

7KHGLIIHUHQFHIQ YDOXHVLVSRWLE GXHWR WKHVKDORZ HUFRP SOHWRQ ILQWLYDORI WKH: ILORZ 6SUQJ VZ HOO Z KIFK SUHXP DE GRHVQRVSHQHWDWLQWR WKHGHHSHU]RQHRI 7HUWLU JUDYHO GRP ILQDWG E\ DWWRQJ FO YRGDQRFOWWF P DWW[,QWKLVFDVH WKHKLJKHU YDOXHRI IHHWGD DSSHDUVWR EHDWRFLDWG Z LWK WKHVKDORZ HU XSSHU IHHWRYHUEXUGHQP DWULDO Z KIFK KDVDZ HDN FO FRP SRQHQWZ KHUHDV YDOXHVRQ WKHRUGHURI RQHIRRWGD DUH

UHSUHVHQWDWLYHRI WKHVOJ KW GHHSHU EHORZ IHHWRYHUEXUGHQ P DWULO Z KLFK KDVD VWURQJ FOD\ YRORODQRFDWLF FRP SRQHQW, WWFD

,Q WKHFDUERQDWHEHGURFN ORZ HUSODWXQLWUHFKDUJ H WRUDJ H IORZ DQG GLVFKDUJ HRI J URXQGZ DWU DUHSUP DUL\ FRQWROOHG E\ WKHVHFRQGDU\ IHDXUHV IUDFWXUHG]RQHV IDXOW DQG VRONWRQ FDYLWHV WKDWKDYHHQKDQFHG WKHRYHUDO0SRUVLW DQG SHUP HDEILOW RI WKHURFN %/ 0 E %DUUFN FRQGXFWG D GD\ K\ GURORJ IF VWHVWWRQ Z HOO* 5 : FRP SOHWG ILQ WKH' Z IRUP DWRQ 7 KH ORFDWRQ RI WKLVZ HOOLVVKRZ QRQ) LJXUH . YDOXHVWKDWDQJ HIURP WR IHHWGD\ Z HUH FDOFXODWG Z LWK DJ HRP HWUF P HDQ RI IHHWGD\ , WWFD

2 QO\ RQHRI WKHZ DWUOHYHOP RQLWRULQJ ORFDWRQVIQ IRUP DWRQVRWKHUWKDQ' Z * 5 * 7 3 ILQWKH' KF UHFRUGHG GUDZ GRZ QGXHWR WKH GD\ SXP SIQJ WWW2 WKHUP RQLWRULQJ Z HOOVDQG SIH]RP HWLVIQ WKHQRQ FDUERQDWIRUP DWRQV IQFOXGLQJ VRP HORFDWRQVIQ UHDWWH\ FORVH SUR[IP LW WR WKHSXP SIQJ Z HOO HJ 5 + 3= 3 DQG 3 DQG * 5 3= 3 GLG QRWWHHDQ\ GUDZ GRZ QGXHWR WKHSXP SIQJ WWW, WWFD

(QYLURQP HQWO&RQVHUXHQFHV: DWU5 HWRXUFHV

3 URSRVHG $ FWRQ

Surface Water Features

7 KH P RQLWRULQJ HYHQWFRQGXFWG XQGHUWKH H[LWQJ FRQLWRQVRI DFUHVRI VXUFH GLVXUEDQFHGLG QRWGHWWFWZ DWUTXDOW SK\ VLFDOSDUP HWUVRUODERUDWU DQDO\WFDOUHXOWWKDW FRQLWWQXO H[FHHGG UHHUHQFH YDOXHV 6RP HH[FHSWRQVZ HUH UHFRUGHG EXWWKHWHYDOXHVZ HUH GHWUP IQHG DVHWKHUVIP IODUWK KLWRUF EDFNJ URXQG0HYHOV RUDVVDJ KWGHYDWRQVIURP VHFRQGDU\ WWQGDUGVDQG DUHQRWFRQVLGHUHG DWKUHWWK KXP DQ KHDOWK RUWKHHQYLURQP HQW

$ QQXDOSUHFSLWWRQ IQ WKH+ & &8 (3 DUHDLVORZ 7 KXV Z DWUIORZ LVUHDWWH) ORZ Z KLFK UHGXFHVWKHHQHJ \ DYDLODEO0HWR FDU\ VHGIP HQWGRZ QWWHP 7 KHUHDUHQR SHUHQQLDOZ DWUZ D\ V IQ WKH+ & &8 (3 3ODQ ERXQGDU\

1 ' (3 DGP IQLWWLVWP SRUDU\ GLVFKDUJ HSHUP IWWR DORZ VXP SVWR GLVFKDUJ HZ DWUIQWR GUDIQDJ HV %DUUFN REWQHG D*DeMinimis* J HQHUDOGLVFKDUJ HSHUP IW1 9 * IRUWKH GD\ FRQWWQWUDWSXP SIQJ WWWGHWFUEHG DERYH

,QRUGHUWR UHP DIQ FRP SOODQWZ IWK WKHFXUUHQW* HQHUDO6WRUP Z DWU3HUP IW1 9 5 IWXHG E\ WKH1 ' (3 1 ' (3 %DUUFN SUHSDUHG D6: 333 65. IRUWKHVWWIQ DFFRUGDQFH Z IWK WKH1 DWRQDO3 RORXWQW IVFKDUJ H(OP IQDWRQ6\ WWP 1 3' (6 UHJ XODWRQ 7 KHREMHFWXYH RI WKH6: 333 IVWR P IQIP I]HWKHGLVFKDUJ HVRI VHGIP HQWRUFRQWP IQDQWDVHWKHUGLUHFWRU IQGLUHFWGLVFKDUJ HVWR Z HWDQGVRURWKHUZ DWUVWKURXJ K WKHDSSURSUDWXVHRI WKHFXUUHQW%0 3V Z IWKIQ WKH+ & &8 (3 3ODQ 65. %DUUFN KDVDOR GHYHORSHG D VSLOOFRQWQJ HQF\ SODQ IRU FRP SOODQFHZ IWK &: $ UHJ XODWRQVWKDWWHTXLUHHWXEEOWKHG SUFHGXUHVWR SUHYHQWWKHGLVFKDUJ H RI RLOIQWR Z DWUVRI WKH8 6

([SORUDWRQ DFWWYLWHVKDYHEHHQ FRQGXFWG XQGHUFXUUHQWSHUP IWDQG DSSURYDOV DQG IQ DFFRUGDQFHZ IWK WKHDSSOFDQWFRP P IWWG(30 VGHWWOHG IQ 6HFWRQ DQG%0 3VOWWG IQ **$ SSHQGIX %** 7 KHWHSHUP IW P HDXUHVDQG SUDFWFHVKDYHEHHQ DQG Z RXOG FRQWQXHWR EH

IP SOHP HQWG XQGHUWKH3URSRVHG $ FWRQ 6SHFLIF WR VXUFHZ DWHUV WKH(30 VDQG %0 3V ILQFOXGH WKH VSLOOFRQWQJ HQF\ SODQ VRLOHURVRQ SUHYHQWRQ DQG FRQWRO SUDFWFHV GLVWDQFH VHW EDFNV GHVJ QWWQGDUGV GXWFRQWRO HDXUHV DQG GULOOKRO HDEDQGRQ HQVSURFHGXUHV VHWWRUWK ILQ1 $ & WKURXJ K

5 RDG FRQWXXFWRQ DQG GUDLQDJ HRSHUDWRQVDUHJ RYHUQHG E\ WKH 6WDWH RI 1 HYDGD* HQHUDO 6WRUP Z DWHU3HUP LWI 9 5 0 6: DSSURYHG 0 DUFK %0 3VIRUURDG FRQWXXFWRQ DQG P DLQWHQDQFH DUHGHVFUEHG ILQ 6HFWRQ

,QDGGLWRQ UHFOP DWRQ KDV WWEEOD] HG VRLOV UHGXFLQJ WKH SRWHQWDO IRUIP SDFWVWR VXUFHZ DWHUV 5HFOP DWRQ DFWXWLWHVKDYHUHFRQWXUHG DQG VHGHG DFUHVRI WKHH[LWQJ DFUHVRI GLWXUEDQFH KRZ HYHU QRQHRI WKLVDFUHDJ HKDVEHHQ UHOHDVHG IURP WKHUHFOP DWRQ DWXUDQFHE\ WKH%/ 0 RUWKH1 ' (3

6HHSV\SUIQJ VDQG RWKHUZ HQDQG DUHDVKDYHEHHQ DYRLGHG WKURXJ K DGKHUHQFH WR WKHDSSOFDQW FRP P LWWG (30 V 7KHMHVXUFHIHDXUHVKDYHQRWEHHQIP SDFWG

) RUWKHMHUHDVRQV XQGHUWKH3URSRVHG $ FWRQ WKHSRWQWDOIRUIQFUHDVHG VHGIP HQWWRQ WR KDYH RFFXUHG DVDUHXOWRI WKH DFUHVRI VXUFHGLWXUEDQFHDFWXWLWHVIVOBZ + & &8 (3 H[SORUDWRQ DFWXWLWHVKDYHQRWUHXOWHG IQ DGYHUVHHIHFWWR VXUFHZ DWHUV RUFDXVHG DFKDQJH RUORWRI Z HQDQGVDQG USDUDQ] RQHV

8 QGHUWKH3URSRVHG $ FWRQ WKHDFUHDJHRI WRWDOOOBZ DEOHVXUFHGLWXUEDQFHZ RXOG IQFUHDVH E\ DFUHVWR WRWDOFUHVRI GLWXUEDQFH : DWUTXDOW Z RXOG FRQWQXHWR EHP RQLWRUHG DW WKHHWXEOXKHG WWHDP DQG VHHS VSUIQJ VLWW : IWK FRQWQXHG IP SOHP HQWWRQ RI WKHDSSOFDQW FRP P LWWG (30 V %0 3V DQG UHFOP DWRQ SUDFWFHV IQFUHDVIQJ WKHWRWDOOOBZ DEOHVXUDFH GLWXUEDQFHWR DFUHVIVQRWDQWFLSDWG WR IQFUHDVHWKHSRWQWDOIRUHIHFWWR Z DWUTXDOW RU VXUFHZ DWUIHDXUHV IQFOXGIQJ WWHDP V VHHSVSUIQJ V DQG RWKHUZ HQDQGVDQG USDUDQ] RQHV 0 IQRUDP RXQWRI VHGIP HQWP D\ HQWUVXUFHZ DWUVGXHWR GLWXUEDQFHDFWXWLWHVDQG GULYIQJ RQGLWWRDGV KRZ HYHU HURVIRQ DQG GXWFRQWROP HDXUHVZ RXOG FRQWQXHWR P DLQWQ WKH HIHFWDWCHJ OJ IEOHOHYHOV 5HFOP DWRQ SUDFWFHVGHWFUEHG ILQ 6HFWRQ Z RXOG IXUWHU P IQIP I]HWKHSRWQWDOIRUIP SDFWWR VXUFHZ DWUVE\ HOP IQDWQJ EDUHJ URXQG DQG WKHFKDQFH IRUHURVIRQ DQG VXEVHTXHQWWHIP HQWWRQ WR RFFXU ,P SDFWWR VXUFHZ DWUVXQGHUWKH 3URSRVHG $ FWRQ P D\ IQFOXGHVP DOOP RXQWRI VHGIP HQWWRQ RYHUD VKRUWWUP GXUDWRQ EXW HIHFWZ RXOG EHP IQRUGXHWR WKHSUHYHQWRQ P HDXUHVDQG H[LWQJ EDVHOQHFRQGIWRQV

Groundwater

5 HXOWVIURP JURXQGZ DWUP RQWRUQJ Z HOVDQG SIH]RP HWUVVKRZ OP IWG FRQQHFWXYIW IQ WKH + & &8 (3 DUHDEHWZ HHQ WKHWZ R SUP D\ K\ GURJ HROR JIF XQIW WKHEDVQ IIOXQIWDQG WKH FDUERQDWEHGURFN OBZ HUSOWXQIW

' XUQJ WKH GD\ SXP SIQJ WWWRQ) RQHRI WKHZ DWUOHYHOP RQWRUQJ OBFDWRQVIQ DIRUP DWRQ RWKHUWKDQ' Z UHFRUGHG GUDZ GRZ Q 2 WKHUP RQWRUQJ Z HOVDQG SIH]RP HWUVIQ WKHQRQ FDUERQDWIRUP DWRQVGIG QRWHHDQ\ GUDZ GRZ Q GXHWR WKHSXP SIQJ WWW7 KHWWWUHXOVDUH FRQVWWQWZ IWK WKHFRQFHSWRI OP IWG K\ GUDXOF FRQQHFWRQ EHWZ HHQ WKH' Z DQG P RWWRI WKH

RWKHUQRQ FDUERQDWHXQLWLQWKH+ RUVH&DQ\RQ DUHD ,WDVFD + & &8 (3 H[SORUDWRQ DFWLYLWLHVKDYHQRWEHHQ VKRZ QWR DIIHFW JURXQGZ DWHUOHYHOV

0 LQHUDOH[SORUDWRQ GHYHORSP HQWDQG FRQGP QDWRQ GULOOKROHVDVZ HOODVP RQLWRULQJ DQG SURGXFWRQ Z HOOVXEMHFWW1 ' : 5 UHJXODWRQVZ LOOEHDEDQGRQHG LQ DFFRUGDQFHZ LWKDSSOLFDEOH UXOHVDQG UHJXODWRQV 1 $ & WKURXJK %RUHKROHVZ LOOEH VHDODG WR SUHYHQW FURVVFRQWP LQDWRQ EHWZHHQ DIXLHLV DQG WKHUHIXLHG VKDOOZ VHDOZ LOOEHSOXFHG WR SUHYHQW FRQWP LQDWRQ E\ VXUFHFHFHW 7KHSRWQWDOIRUFRQWP LQDWRQ E\ GULOOQ IOXLGVVP LQIP I]HG E\ DGKHUHQFHWR %0 3VDQG GULOOKROHDEDQGRQ HQVSURFHGXUHV ,WVIXUWHUP LQIP I]HG E\ WKH IDFWWKDWFRQFHFWWVW EHWZHHQ WKHK\GURJ IF XQLWVLVVKRZ QWR EHOP LWG 7KHJURXQGZ DWU P RQLWRULQJ SURJUP Z DVIP SOP HQWG XQGHUWH3URSRVHG$ FWRQ GXULQJ WKHVXUFH GLVXUEDQFHRI DFHV 7KHJURXQGZ DWUP RQLWRULQJ SURJUP Z RXOG FRQWQXH XQGHUWH 3URSRVHG$ FWRQ IRUWKHDGGLWRQDO DFHVRI VXUFHGLVXUEDQFH $ VRXWQHG DERYH H[SORUDWRQ DFWLWHVVUHVXOWQJ IQ DFHVRI FXUHQWGLVXUEDQFHDQG WKHSURSRVHG DGGLWRQDO DFHVRI GLVXUEDQFHDUHQRWQWFLSDWG WR KDYHGHWP HQWOHIHFWRQJ URXQGZ DWU

1 R$ FWRQ

8 QGHUWH1 R$ FWRQ$ OWUQDWYH IP SDFWWR VXUFHZ DWUZ RXOG EHP IQIP DO DVH[SORUDWRQ DFWLWHVZ RXOG EHOP LWG WR RQ) RFFXUUQJ IQ RSHQ DQG DFWYHDUHDV 7KHDSSOFDQWFRP P LWG (30 VDQG %0 3VWR SUHYHQWWHGIP HQWDWRQ RUWKHUIP SDFWWR VXUFHZ DWUZ RXOG FRQWQXHWR EHIP SOP HQWG 5HFOP DWRQZ RXOG EHRQ RIQJ DQG Z RXOG UHHWWEDVK YHJHWDWRQ IQ WKH UHP DIQIQJ RSHQ DQG DFWYHDUHDVRQFHH[SORUDWRQZ RUNLVFRP SOHWG 7KHUHLVOP LWG FRQQHFWYLW EHWZHHQ WKHSUP DU\ K\GURJHROR\ IF XQLW ,P SDFWWR JURXQGZ DWUDUHQRW DQWFLSDWG

&XP XODWYH(IIHFW

Proposed Action

6HGIP HQWDWRQZ RXOG EHP IQIP I]HG E\ WKHIP SOP HQWDWRQ RI DSSOFDQWFRP P LWWG(30 VDQG %0 3V 7KHP RXQWDUHDQWFLSDWG WR EHUHDWYH\ VP DOO DQG Z RXOG QRWFRP EIQHZ LWK RWKHU SDWWSUHVHQWDQG5)) $ VWUHXOWQ VJ QIIFDQWFXP XDWYHIP SDFW ' ILHFWRUIQGIUHFWP SDFW WR VHSV\SUIQJ VDQG RWKHUZ HWDQGV DQG JURXQGZ DWUDUHQRWDQWFLSDWG WKHUHRUH FXP XDWYH HIIHFWZ RXOG QRWRFFXU

No Action

6HGIP HQWDWRQP D\ RFFXU EXWZ RXOG EHP IQIP DOZ LWK WKHIP SOP HQWDWRQ RI WKH%0 3VDQG (30 VRXWQHG SUHYRXV) $ VVXFK LWVVQRWDQWFLSDWG WR FRP EIQHZ LWK HIIHFWIURP RWKHU SDWWSUHVHQWDQG5)) $ VWUHXOWQ D VJ QIIFDQWFXP XDWYHIP SDFW ILHFWRUIQGIUHFWP SDFW WR VHSV\SUIQJ VDQG RWKHUZ HWDQGV DQG JURXQGZ DWUDUHQRWDQWFLSDWG WKHUHRUH FXP XDWYH HIIHFWZ RXOG QRWRFFXU

9 HJ HWDWRQ5 HWRXUFHV

7KLVVHFWRQ GHVFUEHVWKHJ HQHUDOYHJ HWDWRQ IRXQG IQ WKH+ & &8 (3 DUHD 6SHFLDOWWXVSDQW VSHFIHVDUHGLVFXVHG IQ6HFWRQ 7KHDQD)VLVRI SRWQWDOGLHFWWQG IQGLHFWP SDFW

FRQVLGHUVJ HQHUDOYHJ HWDWRQ QR[IRXVZ HHGV DQG LQYDVLYHDQG QRQ QDWLYHSODQWZ LWKLQ WKH + & &8 (3 3DQ ERXQGDU\ 7 KHFXP XODWLYHHIIHFWDQ0 VLVFRQVLGHUVSDWWSUHVHQWDQG 5)) $ V DWWDLQ **7 DEOH** WKDWKDYHLQYROYHG GLVXUEDQFHWR YHJ HWDWRQ Z LWLQ DJ HRJ UDSKIF DUHD HQFRP SDVVLQJ WKHVRXWZ HVWLQ SRUWRQ RI 3 LQH9 DOOH WKHVRXWHLQ SRUWRQ RI &UHVFHQ9 DOOH DQG WKHQRUWKHLQ SRUWRQ RI * UDV9 DOOH

$ IIHFWG (QYLURQP HQW0 HJ HWDWRQ 5 HVRXUFHV

9 HJ HWDWRQ RI QRUWKHDVWLQ1 HYDGD IQFOXGLQJ WKH&RUW] 0 RXQWLQV KDVH[SHUHQFHG VXEVWDQWDOFKDQJ HRYHUWKHSDW \ HDUV 7 KHP DWUW RI WKHMHFKDQJ HVDUHDUHXOWRI Z LOGILUH DQG JUD]LQJ E\ GRP HWWF OYHWRFN (6&2 D 0 XFK RI WKHUHJ IRQ LVQRZ GRP LQDWG E\ FKHDWUDV *Bromus tectorum* DOWLQJ QDWYHYHJ HWDWRQ FRP P XQLW FRP SRVLWRQV &KHDWUDV IVKLJ KO IOP P DEOH DQG Z LOGILUHVIQ FKHDWUDV FRP P XQLWHVRFFXUDWKJ KHJ UHTXHQF\ DQG IQWQVLW FRP SDUHG WR ILUHVIQ QDWYHYHJ HWDWRQ FRP P XQLWHV 7 KLVIQFUHDVHIQ ILUHIQWLYDOWQGV WR HQFRXUDJ HI XUWKHU\SUHDG RI FKHDWUDV DQG RWKHUDQQXDOZ IQWURSSRUWQLWF VSHFLHV 0 F$ GRR HWDO ,Q DUDQJ HILUHIP SDFWG WKHHDWWQ SRUWRQ RI WKH+ & &8 (3 DUHD EXLQIQJ DSSUR[IP DWO DFUHV SHUFHQWRI WKH+ & &8 (3 DUHD

9 HJ HWDWRQ DQG/ DQG &RYHU7 \ SHV

9 HJ HWDWRQ IQYHQWRUHVRI WKH+ & &8 (3 DUHDKDYHEHHQ FRQGXFWG VIQFH WR GRFXP HQW H[LWQJ FRQGLWRQVDQG DFFRXQWRUDOWUDWRQVIQ YHJ HWDWRQ FRP P XQLWHVGXHWR GLVXUEDQFH IURP Z LOGILUHDVZ HOOD+ & &8 (3 H[SORUDWRQ DQG UHFOP DWRQ DFWYLWHV 7 Z HQW QIQH YHJ HWDWRQ DQG ODQG FRYHUWSHVKDYHEHHQ IGHQWIHG IQ WKH+ & &8 (3 DUHD (6&2 D 5 HVXOWRI WKHIQYHQWRU DUHVKRZ QIQ **7 DEOH** DQG **) IJXUH**

7 DEOH + & &8 (3 0 DSSHG 9 HJ HWDWRQ DQG/ DQG &RYHU7 \ SHV

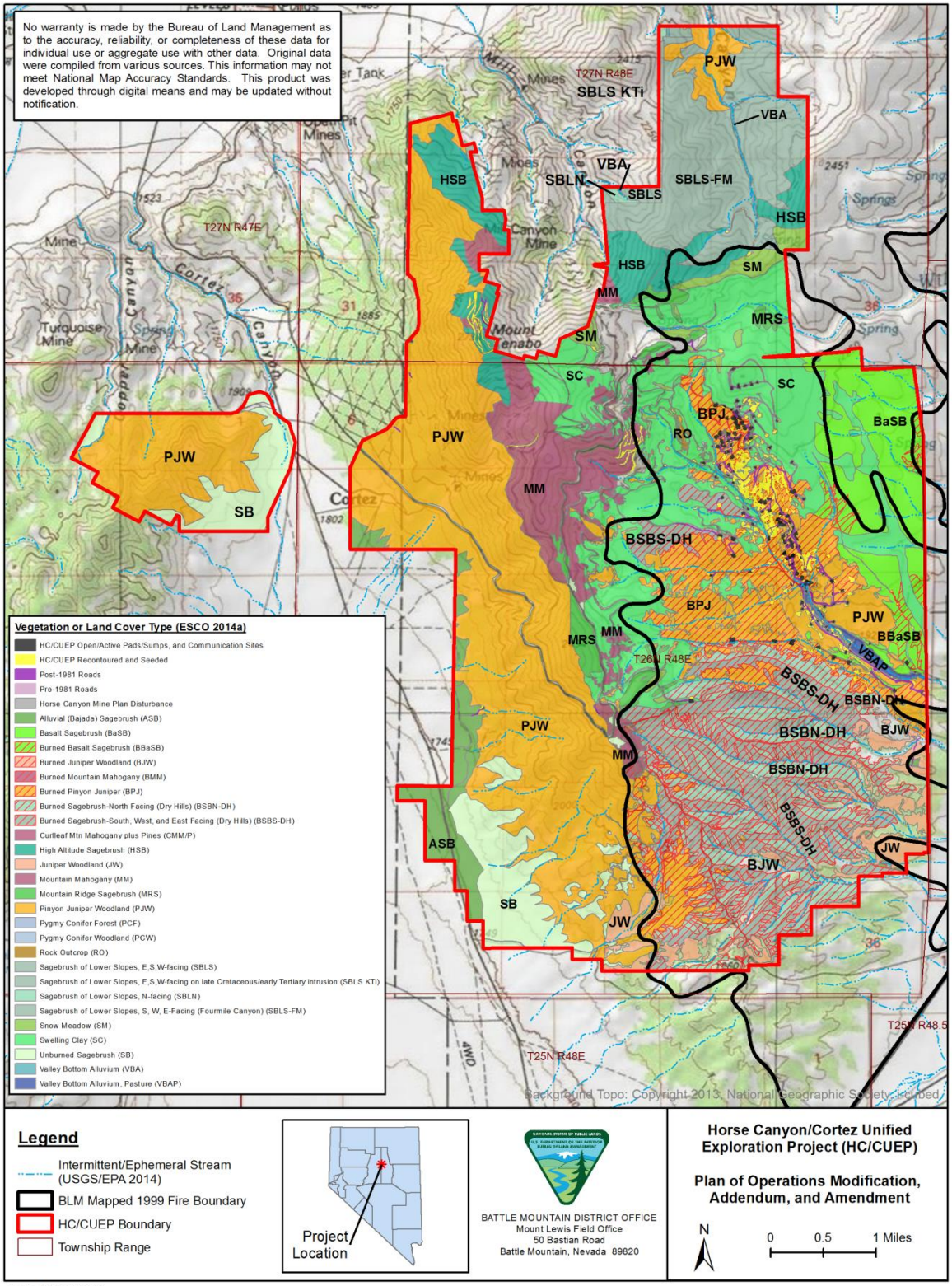
9 HJ HWDWRQ DQG/ DQG &RYHU7 \ SH	$ FUHV	3 HUFHQWRI + & &8 (3 $ UHD
3IQ RQ-XQLSHU: RRGDDQG 3-:		
6Z HOOQJ &OD 6&		
%XUQHG 6DJ HEUXVK 6RXWK : HWWDQG (DWY DFIQJ ' U\ + IOOV %6%6 ' +		
%XUQHG 3IQ RQ-XQLSHU %3-		
6DJ HEUXVK RI / RZ HU6 OPSHV 6 : ( ) DFIQJ) RXUP IOH&DQ RQ 6%/ 6) 0		
%XUQHG 6DJ HEUXVK 1 RUWK) DFIQJ ' U\ + IOOV %6%1 ' +		
0 RXQWLQ0 DKRJ DQ 0 0		
8 QEXUQHG 6DJ HEUXVK 6%		
%DVDOW6DJ HEUXVK %D6%		
+ LJ K$ OWXGH6DJ HEUXVK + 6%		
-XQLSHU: RRGDDQG -:		

7DEOH + &&8 (3 0 DSSHG9 HJHWDWRQ DQG/ DQG&RYHU7\SHV

9HJHWDWRQ DQG/ DQG&RYHU7\SH	$FUHV	3HUFHQWRI + &&8 (3 $UHD
$ GXOW%DVDOD 6DJHEUXVK $ 6%		
%XUQHG-XQLSHU: RRGODQG %-:		
+RUVH&DQ RQ0 ICH3DQ' LVWXUEDQFH ' LVW		
+&&8 (3 ' LVWXUEDQFH *Recontoured and Seeded (250 acres)* *Active/Open Pads and Sumps (86 acres)* *Post-1981 Roads (72 acres)* *Communication Sites (1 acre)*		
0 RXQWDLQ5 IGJ H6DJHEUXVK 0 56		
6QRZ 0 HDGRZ 60		
%XUQHG%DVDOW6DJHEUXVK %%D6%		
6DJHEUXVK RI / RZ HU6 ORSHV (6: IDFLQJ 6%/ 6		
3UH 5 RDGV		
9 DOOH %RWWRP $ GXOXOXP 3DVXUH 9 %&$ 3		
9 DOOH %RWWRP $ GXOXOXP 9 %&$		
6DJHEUXVK RI / RZ HU6 ORSHV 1 IDFLQJ 6%/ 1		
6DJHEUXVK RI / RZ HU6 ORSHV (6: IDFLQJ RQ DWW&UHWWFHRXVRUHDW0 7HUWDU\ ICWXXVIRQ 6%/ 6 . 7L		
%XUQHG0 RXQWDLQ0 DKRJDQ %0 0		
5 RFN2 XWFURS 52		
3\JP\ &RQIHU: RRGODQG 3&:		
&XOOHH 0 RXQWDLQ0 DKRJDQ SOXV3ICHV &0 0 3		
3\JP\ &RQIHU) RUHVW3&)		

0 HDVXUH HQWQYHQWU FRQGXFWG IQ DFFRUGDQFHZ LWK UHYLVHG VXUIDFH GLWXUEDQFH DQG UHFODP DWRQ VXUYH SURWFRO $ SSHQGL $

) LJXUH 9 HJHWDWRQ DQG &RYHU7 \SHV



Date: 11/12/2014

' HVFUSWRQVDUHJLYHQEHORZ IRUWKHP RWWFRP P RQ YHJHWDWRQDQG OQDQG FRYHUWSHV Z KIFK DFFRXQWRU SHUFHQWRI WKH+ & &8 (3 DUHD $ OOGHVFUSWRQVDUHGHUYHG IURP (6&2 D

Pinyon-Juniper Woodland and Juniper Woodland

3LQ RQ-XQLSHU: RRGODQG DQG-XQLSHU: RRGODQG OQDQG FRYHUWSHVDUHWKHP RWWFRP P RQ YHJHWDWRQFRP P XQLWHVLQWKH+ & &8 (3 DUHD 7RJHWKHUWKH\ DFFRXQWRUDSSUR[IP DWO\ SHUFHQWRI WKHODQG FRYHUZ LWKLQ+ & &8 (3

7KHP DWRUW RI WKHIQWFWLH XQEXLQHG SIQ RQ NXQLSHUFRP P XQLWHVDUHFRQFHQWUDWHG LQ WKH Z HVWHUQ SRUWRQ RI WKH+ & &8 (3 DUHD RQ WKHZ HVWWRSHRI WKH&RUW] 0 RXQWDLQV 7KH GRP LQDQWWHHVZ LWKLQ WKHH[LVWLQJ Z RRGODQGVDUHVLQJOHOHDI SIQ RQ SIQH *Pinus monophylla* DQG RU8 WXK NXQLSHU *Juniperus osteosperma*

-XQLSHUZ RRGODQGVRFFXULQ VP DOODUHDVRQ WKH VRXWKHQ DQG VRXWKHDWWLQ VORSHVRI WKH + & &8 (3 DUHD 7KLVYHJHWDWRQ WSH Z KIFK OLFNVWKHSIQ RQ FRP SRQHQWZ DVIGHQWIHG DVD VHSDUDWWSHIURP WKH3IQ RQ-XQLSHU: RRGODQG WX DFFRXQWRUWKHGLIIHUHQWZ LOGOLHKDEITW SURYLGHG E\ HDFK DQG WKHFXOXUDOIP SRUWQFHUHSUHVHQWG E\ WKHSIQ RQ SIQHFRP SRQHQWRI WKH 3IQ RQ-XQLSHU: RRGODQG 7KHKHUEFHRXVXQGHUWRU RI QDWYHSHUHQLDOJUDWHVDQG IRUEV DYHUDJHVOHVWKDQ WKUHHSHUFHQWFRYHUIQ ERWK WKH3IQ RQ-XQLSHU: RRGODQG DQG-XQLSHU : RRGODQG WSHV

Low Elevation Sagebrush

7KH/ RZ (OHYDWRQ6DJHEUXVK OODQG FRYHUWSHWKDWZ DVP DSSHGIQ+ & &8 (3 IQFOXGHV VDJHEUXVK RI ORZ HUVORSHV XQEXLQHG VDJHEUXVK EDVLQWDJHEUXVK DQG DOXYLDOVDJHEUXVK (6&2 D 7RJHWKHUWKH\ FRP SULVHDSSUR[IP DWO\ SHUFHQWRI WKH+ & &8 (3 DUHD 7KHVH VDJHEUXVK FRP P XQLWHVDUHJHQHUDOO\ IRXQG IQ WKH+ & &8 (3 DUHDEHORZ IHHWHOHYDWRQ RQ YDUIEOHWHUUDIQ DQG VRLOSDUHQWP DWHULDO %DVLQWDJHEUXVK LVORFDWG RQ WKHHDWWLQ HGJHRI + & &8 (3 DQG DOXYLDOVDJHEUXVK LVORFDWG RQ WKHZ HVWWLQ HGJHRI + & &8 (3 QHDU* UDW 9 DOOH\ 8 QEXLQHG VDJHEUXVK LVDOVR ORFDWG RQ WKHZ HVWWLQ HGJHRI WKH+ & &8 (3 ERXQGDU\ DV Z HOODVRQ WKHZ HVWWLQ P RWW+ & &8 (3 SDUHOIQ WKH7 RI\ DEH5 DQJH 2 WKHUORZ HOHYDWRQ VDJHEUXVK LVRQ WKHORZ HUVORSHVRI) RXUP IOH&DQ RQ

: \ RP IQJ EIJ VDJHEUXVK LV WKHGRP IQDQWDJHVSHFLHV EXWFDWLQ EIJ VDJHEUXVK *Artemisia tridentata tridentata* RFFXUVDWORZ HJHRP RUSKIF SRVWWRQV 6RP HEODFN VDJHEUXVK *A. nova* DQG ORZ VDJHEUXVK *A. arbuscula* RFFXURQ VKDOORZ URFN\ VWW 7KHORZ HUHOHYDWRQ VDJHEUXVK DYHUDJHVDERXW SHUFHQWWKUXE FRYHU DQG LVWSIFDOO GRP IQDWG E\ VDJHEUXVK DQG FKHDWUDV Z IWK YDU\IQJ DP RXQWVRI QDWYHEXQFKJ UDVHVDQG RWKHUQDWYHJ UDVHV 7KHUHDUHOP IWG QDWYH SHUHQLDOIRUEVDWWKHVHORZ HUHOHYDWRQ VDJHEUXVK FRP P XQLWHV 7KH IIUHDOWHUHG ODJ H H[SDQVHVRI ORZ HUHOHYDWRQ VDJHEUXVK IQ WKH+ RUVH&DQ RQ DUHD

6DJHEUXVK FRP P XQLWHVRI WKHQRUWKHUQ SRUWRQ RI WKH+ & &8 (3 DUHD HJ) RXUP IOH&DQ RQ KDYHJHQHUDOO\ P XFK WWHSHUVORSHVDQG GLIIHUQJ VRLOSDUHQWP DWHULDO 7KHSUHVHQFHRI UDYIQH IHVFXH *Festuca sororia* DQG 1 HYDGDQHQGHJ UDW *Achnatherum nevadense* DUHDP RQJ WKH

FRP SRVLWRQDOGLIIHUHQFHV &KHDWUDWLVP XFK P RUHDEXQGDQWRQ QRUWK IDFLQJ VORSHVFRP SDUHG WR RWKHUDVSHFWLQ WKH) RXUP LOH&DQ\RQ DUHD

Burned Sagebrush

%XUQHG6DJHEUXVK OOQG FRYHUWSHLVORFDWG RQ DOODVSHFWRI WKH' U\ + LOOVDUHD LH EXUQHG VDJHEUXVK VRXWK Z HWWDQG HDWWDFLQJ ' U\ + LOOV DQG EXUQHG VDJHEUXVK QRUWK IDFLQJ ' U\ + LOOV 7 KLVFRYHUWSHFRP SULVHVDSSUR[IP DWH) SHUFHQWRI WKH+ &&8 (3 DUHD

7 KH' U\ + LOOVDUHORFDWG Z LWKLQ WKH VRXWKHUQ SRUWRQ RI WKH+ &&8 (3 DUHD 7 KHUHKDVEHHQ OP LWG UHFRYHU\ RI VDJHEUXVK LQ DUHDVWKDWEXUQHG LQ WKH IILUH Z LWK VDJHEUXVK FRYHU DYHUDJLQJ EHZ HHQ DQG SHUFHQW&KDUDFWHULWWFVRI EXUQHG VDJHEUXVK RQ QRUWKHUQ DSSHFW GLIIHUJURP EXUQHG VDJHEUXVK RQ RWKHUDSSHFW 7 KHP DQ VKUXE LV' RXJODVUDEEEIWUXVK *Chrysothamnus viscidiflorus* Z LWK DWRWDOVKUXE FRYHURI SHUFHQWRQ QRUWK IDFLQJ VORSHV DQG DERXWLYHSHUFHQWRQ RWKHUDSSHFW 7 KHEXUQHG VDJHEUXVK DUHDVKDYHP RUHEOXHEXQFK Z KHDWUDW *Pseudoroegneria spicata* DQG7 KXUEHUQHHGOHJUDW *Achnatherum thurberianum* FRP SDUHG WR XQEXUQHG VDJHEUXVK DUHDV 7 KHQRUWK IDFLQJ EXUQHG VDJHEUXVK KDVSSUR[IP DWH) WZ IFHDVP XFK JUDWFRYHU 7 KHQDWYHSHUFQ LDOIRUE FRYHUDYHUDJHLQ EXUQHG VDJHEUXVK LV DERXW SHUFHQWRQ WKHQRUWK IDFLQJ DUHDVDQG ILYHSHUFHQWRQ RWKHUH[SRVXUHVFRP SDUHG WR WKH OHVVWKDQ RQHSHUFHQWRUWKHXQEXUQHG VDJHEUXVK DUHDV &KHDWUDW FRYHURQ WKHEXUQHG VDJHEUXVK QRUWK IDFLQJ DUHDVLVQHDO SHUFHQWDQG DERXW SHUFHQWRQ WKHRWKHU[SRVXUHV FRP SDUHG WR OHVVWKDQ WZR SHUFHQWLQ XQEXUQHG VDJHEUXVK

Swelling Clay

7 KH6Z HOOQJ &OD\ OOQG FRYHUWSHLDFFRXQWVIRUDSSUR[IP DWH) SHUFHQWRI WKH+ &&8 (3 DUHD ,WRFFXUVRQ WKHP IGGOHWR XSSHUVORSHVLQ WKHQRUWKHDWWLQ DQG FHQWDOSRUWRQVRI WKH + &&8 (3 DUHD 7 KLVWSHLVFKDUDFWUL]HG E\ FO\ SDQ VRLOV 6KUXE FRYHULVWSIFDO) P RGHUDW FRQLWWQ RI ELJ VDJHEUXVK DQG' RXJODVUDEEEIWUXVK 7 KHIRUE FRYHULVJ HQHUDO) P XFK KJ KHU WKDQ DWRWKHUVDJHEUXVK VLWW / DJ HQXP EHLVRI WS URRWG SHUFQLDOVRIWQ FR RFFXU 6RP HVLWW DUHORFDWG RQ KJ K HOHYDWRQ Z IQG VZ HSWLWW Z LWK FRQFDYHWRSRJ UDSK\ 7 KLVWSRJ UDSK\ FRQOHFWZ IQG EORZ Q VQRZ Z KIFK IQ FRQXMQFWRQ Z LWK KJ K VRLOVXUDFHSHUP HDEIOOW SURYIGHV P RLWXUHWXGHHS URRWG VSHFLHVIQ WKHVSUIQ DQG HDO) VXP P HU

Burned Pinyon-Juniper and Burned Juniper Woodland

7 KH%XUQHG3IQ\RQ -XQLSHUDQG%XUQHG -XQLSHU: RRGOODQG OOQG FRYHUWSHVDFFRXQWWRU DSSUR[IP DWH) QLQHSHUFHQWRI WKH+ &&8 (3 DUHD 7 KHMHWSHVRFFXUIQ WKHHDWWLQ DQG VRXWKHQ SRUWRQVRI WKH+ &&8 (3 DUHD IQFOXGLQJ Z LWKLQ+ RUVH&DQ\RQ 7 KHEXUQHG MXQLSHUZ RRGOODQGV DUHIRXQG DWORZ HUHOHYDWRQVWKDQ WKHEXUQHG SIQ\RQ MXQLSHUZ RRGOODQGV 7 UHFRYHULVQRQ H[LWWQWQG DYHUDJHSHUFQLDOKHUEFHRXVFRYHULVUHOWWYH) KJ K J UHDWUWKDQ SHUFHQW &KHDWUDWFRYHUIQ WKHMHEXUQHG Z RRGOODQGVKDVEHHQ HWWP DWG WR EHUHOWWYH) OORZ DSSUR[IP DWH) HJ KVSHUFHQW

Mountain Mahogany

7 KH0 RXQWDLQ0 DKRJDQ\ ODQG FRYHUWSHDFFRXQWVIRUDSSUR[IP DWH\ ILYHSHUFHQWRI WKH &&8 (3 DUHD ,WRFFXUVDWWKHKLJK HOHYDWRQVRQ WKHHDWWRSHRI WKH&RUW] 0 RXQWDLQV ILQ WKHFHQWUDOSRUWRQRI WKH&&8 (3 DUHD 7KLVYHJHWDWRQWSHFRQLWWRI DERXW SHUFHQW FRYHURI FXUOHDI P RXQWDLQP DKRJDQ\ *Cercocarpus ledifolius* Z LWK YDUIQJ DP RXQWVRI VLQJOHOHDI SLQ\RQSLQH / IP EHUSLQH *Pinus flexilis* RFFXUVVSRUDGLFDOO 2 WKHUZ RRG\ SODQWV WKDWDUH SUHVHQWLQFOXGHVHUYLFHEHUU *Amelanchier alnifola* GHVHUWJ RRVHEHUU *Ribes velutinum* P RXQWDLQ EIJ VDJHEUXVK *Artemisia tridentata* VVS *vaseyana* DQG GHVHUWQRZ EHUU *Symphoricarpos longiflorus* &RYHUE\ QDWXUH SHUHQLDOJ UDVWHVDYHUDJHVOHVVWKDQ WZR SHUFHQW DQG FRYHUE\ QDWXUH SHUHQLDOIRUEVDYHUDJHVDERXW SHUFHQW &KHDWUDWLVYHU OP LWG DYHUDJLQJ SHUFHQWFRYHU 1 DWXHDQXDODQ EIHQLDOSODQWDUHGLYHUVH HYHQWKRXJK WKH DYHUDJHOHVVWKDQ WZR SHUFHQWFRYHU

High Altitude Sagebrush

7 KH+ IJ K$ OWXXGH6 DJ HEUXVK ODQG FRYHUWSHFRP SULVHVDSSUR[IP DWH\ IRXUSHUFHQWRI WKH &&8 (3 DUHD ,WRFFXUVDWKLJ KHUHOHYDWRQVILQ WKHQRUWKHUQ SRUWRQRI WKH&&8 (3 DUHD QRUWK RI 0 RXQW7 HQDER 7KLVVDJHEUXVK VKUXEODQG LVGRP ILQDWG E\ DP I[RI P RXQWDLQ EIJ VDJHEUXVK DQG YDUIQJ DP RXQWVRI RWHUVKUXE VSHFLHV 7KHGLYHUVLW RI JUDVHV VKUXEVDQG QDWXHSHUHQLDOIRUEVLVKLJ KHUWKDQ WKHOWZ HUHOHYDWRQ VDJHEUXVK VLWHV

Horse Canyon Mine Plan Disturbance and Pre-1981 Roads

7 KH&RUVH&DQ\RQ0 ILQH3ODQ GLVWXUEDQFHDQG SUH URDGVWRJHWKHUHQFRP SDVV DSSUR[IP DWH\ WZR SHUFHQWRI WKH&&8 (3 DUHD 7KLVFDWJ RU\ ILQFOXGHVRQ\ WKRVH GLVWXUEDQFHIHDWXUHVWKDWZ HUHFUHDWG E\ DFWRQVH[WHQDOWR&&8 (3 H[SORUDWRQ HJ SLW DWRFLDWG Z LWK WKH&RUVH&DQ\RQ0 ILQH WKH&RUVH&DQ\RQKDXOURDG RUSUH URDGV ,W GRHVQRWLQFOXGHWKHGLVWXUEDQFHIURP &&8 (3 H[SORUDWRQ DFWLYLWHV

HC/CUEP Disturbance

7KLVFDWJRU\ DFFRXQWVIRUVXUIDFHGLVWXUEDQFHUHODWG WR&&8 (3 H[SORUDWRQ DFWLYLWHV LH SDGVDQG VXP SV SRWW URDGV FRP P XQLFDWRQ VLWHV DQG UHFRQRXUHG DQG VHGHG DUHDV ,W ILQFOXGHVRSHQ DQG DFWLYH DUHDV 7KHH[LVWQJ &&8 (3 H[SORUDWRQ GLVWXUEDQFHRI DFUHVLV SHUFHQWRI WKHWRWDO&&8 (3 DUHDRI DFUHV

1 R[IRXV: HHGV , QYDVLYH DQG 1 RQ QDWLYH 3 ODQWV SHFLHV

1 R[IRXVZ HHGV ILQYDVLYH DQG QRQ QDWLYHSODQWVSHFLHVDUHVSHFLHVWKDWDUHKLJ KO\ FRP SHWLWLYH KLJ KO\ DJ JUHVLVH DQG VSUHDG HDVLO\ 1 R[IRXVZ HHGVDQG ILQYDVLYHSODQWVSHFLHVKDYHEHHQ GHILQHG DVSHWWE\ ODZ RUUHJXODWRQ 7KH%/ 0 GHILQHVDQR[IRXVZ HHG DV ³$ SODQWWKDW ILQWUHUHVZ LWK P DQDJ HP HQWREMHFWLYHVIRUDJ LYHQ DUHDRI ODQG DWDJ LYHQ SRLQWWQ WP H %/ 0 E 7KH) HGHUDO1 R[IRXV: HHG$ FWRI DVDP HQGHG E\ 6HFWRQ 0 DQDJ HP HQWRI 8 QGHUUDEOH3ODQWVRQ) HGHUDO' DQGV DXWKRU]HVFRRSHUDWRQ DP RQJ IHGHUDODQG WWWM DJ HQFLHVILQWKHFRQWRORI Z HHGV 7KH%0 ' UHFRJ QL]HVWKHFXUUHQWQR[IRXVZ HHG DWWGHMJ QDWG E\ WKH6WDWRI 1 HYDGD' HSDUWP HQWRI $ JUFXOXUH 1 ' $ WWXXW IRXQG ILQ1 $ &

$ QLQYDVLYHVSHFLHVLVGHLQHGDVDVSHFLHVWKDWLVQRQQDWLYHWRWKHHFRV WWP XQGHU FRQGLGDWRQDQGZKRVHLQWRGXFWRQFDXVHVRULVQLNHV WRFDXVHHFRQRP IF RUHQYLURQP HQWDO KDUP RUKDUP WRKXP DQKHDOWK (2 VLJQHG) HEUXDU $ VRI 0 D\ QR[IRXVZ HHGVZ HUHRQ WKH1 HYDGD1 R[IRXV: HHG/ LVW1 ' $

7KH%/ 0 ¶VSRDF\ UHDWXQ WKWHP DQDJ HP HQWDQG FRRUGLQDWRQ RI QR[IRXVZ HHGVDQG LQYDVLYH SODQWVSHFLHVDFWXLWHVLVVHWRUWKLQWKH%/ 0 0 DQXDO ±,QWJ UDWG: HHG0 DQDJ HP HQW %/ 0 7KH%/ 0 ¶VSUP DU IRFXVLVSURYLGLQJ DGHTXDWHFDSDEILOLW WR GHWHFW WDQG WHDW VP DOOHUZ HHG LQIHVWDWRQVLQ KLJ K ULVN DUHDVEH RUHWKH KDYHDFKDQFHWR VSUHDG 1 R[IRXVZ HHG FRQWROVEDVHG RQ DSURJ UDP RI SUHYHQWRQ HDUO\ GHWHFWRQ DQG UDSLG UHVSRQVH

$ QQXDOQR[IRXVZ HHG VXUYH\ VKDYHEHQ FRQGXFWHG LQ WKH+ & &8 (3 DUHD VLQFH (6&2 $ VRI VL[QR[IRXVZ HHG VSHFLHVDUHNQRZ Q WR RFFXUZ LWKLQ WKH+ & &8 (3 DUHD 7KHP RVWH[WHQVLYHRI WKHVHQR[IRXVZ HHGVLVKRDU FUHW *Cardaria draba* IRORZ HG E\ P XVN WKLVWH *Carduus nutans* DQG6FRWK WKLVWH *Onopordon acanthium* &DQDGDWKLVWH *Cirsium arvense* SRLVRQKHP OREN *Conium maculatum* DQG. OD P DWKZ HHG RUVSRWWG6W-RKQVZ RUW *Hypericum perforatum* RFFXUWR DOD P LWG GHJ UHH

%DUUIFNKDVWWNHQZ HHG FRQWROOFWRQVWR DGGUHVWKHKRDU FUHWDQG P XVN WKLVWHLQ WKH+ RUVH &DQ\RQDUHD (6&2 7KHQR[IRXVZ HHG P DQDJ HP HQWSODQ GHVFUEHVFRQWROP HWKRGV XVHG ZKIFKLQFOXGHP DQXDOUHP RYDO P DQXDOSUHYHQWRQ RI IORZ HUQJ HJ P RZ IQJ FKHP IFDO DSSOIFDWRQ DQG GHYHORSP HQWRI GHMUDEOHDQQXDORUSHUHQQLDOFRP SHWWRQ (6&2 7KH QR[IRXVZ HHG P DQDJ HP HQWSODQ DOR RXWOLHVSURSHUKHUEIFLGHDSSOIFDWRQ DQG KDQGOLQJ WFKQLTXHV ZRUNHUVDHW DQG GHVFUEHVKRZ WR KDQGOHVSLOOV 7KH+ & &8 (3 : HHG 0 DQDJ HP HQW3ODQ LVLQFOXGHLQ$ **SSHQGL\ ***

7KHP RVWFRP P RQ LQYDVLYHSODQWVSHFLHVIRXQG ZLWKLQ+ & &8 (3 LVFKHDWUDW 0 XFK OINHLW GLWUEXWRQ WKURXJKRXW HYDGD WKHVSHFLHVLVIRXQG WKURXJKRXWWKH+ & &8 (3 DUHDIQ YDUIQJ GHQWWHVGHSHQGLQJ RQ RFDO]HG GLWXUEDQFHKLWRU IQFOXGLQJ IILH

6HFWRQ IQFOXGHVGHWDLOVRQ WKHDSSOIFDQWFRP P LWWG(30 VUHDWG WR ZHHG FRQWROWKDW DUHIQFRUSRUDWG IQWR WKH3URSRVHG$ FWRQ

5 HFOD P DWRQ

5 HFOD P DWRQ DFWXLWHV WKDWDUHIQFRUSRUDWG IQWR WKH3URSRVHG$ FWRQ DUHVXP P DU]HG IQ6HFWRQ %DUUIFN D %DUUIFN F

(QYLURQP HQWDO&RQVHTXHQFHV9 HJHWDWRQ5 HWRXUFHV

3URSRVHG$ FWRQ

6XUJFHGLWXUEDQFHDWRFDWG ZLWK+ & &8 (3 H[SORUDWRQ KDVDIIHFWG DFUHVRI WKH + & &8 (3 DUHD ZKIFKHTXDWWWR SHUFHQWRI WKHWRWDO+ & &8 (3 3DQ DUHDRI DFUHV 7KHWRWDOFUHDJHGLWXUEHGIQFOXGHV DFUHVWKDWKDVEHHQ UHFRWRXUHG DQG VHHGHG KRZ HYHU QRQHRI WKLVDFUHDJHKDVEHHQ UHDHDVHG IURP WKHUHFOD P DWRQ DWXUDQFHE\ %/ 0 RI WKH1 ' (3

7KHP DWUWRI VXUIDFHGLVXUEDQFHKDVRFFXUUHGLQDUHDVP DSSHGDV%XLOHG3LQ RQ-XQLSHU 6ZHOOQ &RD VDJHEUXVK DQG EXLOHG VDJHEUXVK FRP P XQLWHV &KDQJHVWR YHJHWDWRQ FRP SRVLWRQLQ WKHEXLOHG DUHDVRI +&&8(3 KDYHQRWDOWHUHG XQGLWXUEHG FRP P XQLWHV 5HFOD P DWRQKDVIP SUYHGRUZRXOG IP SUYHWKHFRQGLWRQRI YHJHWDWRQLQDUHDVWKDWEXLOHGLQ WKH IILUHHYHQW

5HFOD P DWRQLVFRP SOHWHGLQDFFRUGDQFHZLWK%/0 DQG1'(3 UHJXODWRQVDQG UHTXLUHP HQW 7KHUHFOD P DWRQSODQ VSHFLILHVVHGP I[HVWR EHXVHGDQG WWQGDGVWKDWP XWEHP HWWRTXDOL\ DUHDVDV5'3&V $GGLWRQDOGHWDLOVRQUHFOD P DWRQSUDFWFHVRI WKH+&&8(3 3DQDUHLQFOXGHG LQ6HFWRQ

:LWKWKHUHYLVHGGLWXUEDQFHWDFNLQJ DQG UHSRUWQJ SURWRFROXUHQW LQSODFH **$SSHQGL $**RQJRLQJ UHFOD P DWRQ DQG DUHYLVHG5&(DQG LQDQFLDO XDUDQWHUFRQ]LQJ DO)+&&8(3 H[SORUDWRQGLWXUEDQFH WKH3DQ0RGLIFDWRQ DQG$GGHQGXP KDYHDGHTXDW) DFFRXQWG IRU WKHFXUHQWGLWXUEDQFHRI DFUHV1RDGGLWRQDOP LW DWRQLVQHFHVDU

7KH3URSRVHG$FWRQZRXOG DOR DOOR IRUD DFUHLQFUHDVHLQ VXUIDFHGLWXUEDQFHZLWLQ WKH FXUHQW+&&8(3 3DQERXQGDU WR DFUHV7KH DFUHLQFUHDVHLVDQ DGGLWRQDO SHUFHQWRI WKHODQ DUHZLWLQ WKH+&&8(3 ERXQGDU $FUHVRI GLWXUEDQFHZRXOG EH WUDFNHG DQG UHSRUWG DFFRUGLQJ WR WKHUHYLVHG SURWRFRO **$SSHQGL $** WRWDOXUIDFHGLWXUEDQFHXQGHU WKH3DQ$P HQGP HQW ZRXOG QRW[FHHG DFUHV

5HFOD P DWRQ DFWWLWHVZRXOG FRQWQXHDVH[SORUDWRQZRUNLVFRP SOHWHG JUDGXDOO ILQFUHDVLQJ WKHP RXQWRI DUHDWKDWVUHFRQRXUHG DQG VHGHG ([SORUDWRQ DFWWLWHVZRXOG KDYHDQ IP P HGDWHI HFWRQ YHJHWDWRQ FRP P XQLW FRP SRVLWRQ EXWRQJ WLP UHWGXDOHI HFWZRXOG EHP ILQIP I]HG WKURXJK ZHGP DQJHP HQWSUDFWFHVDQG DVUHOD P DWRQ IVFRP SOHWHG (IIHFWRQ YHJHWDWRQ DVDUHXXOWRI WKH3URSRVHG$FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUIDFHGLWXUEDQFH ZRXOG EHP ILQIP DO J LYHQ WKHVP DOOSHUFHQWJHRI GLWXUEDQFHILQ WKHWRWO+&&8(3 DUHDDQG WKH UHJXODWU UHTXLUP HQWDQG IILQDQFLDOJXDUDQWH IRUUHOD P DWRQ

$VSDUWRI WKH3URSRVHG$FWRQ IP SOHP HQWDWRQ RI WKHJUHDWUVJHJURXVH(30 VFRXOG DIIHFW DSSUR[IP DWO DFUHVRI SIQ RQ WQLSHUDQG WQLSHUFRP P XQLW WSHV VHH6HFWRQ DQG 6HFWRQ 7KHIP SOHP HQWDWRQ RI WKHJUHDWUVJHJURXVH(30 VZRXOG KHS WR P LQWLQ DQG HQKDQFH GLYHUVHQDXUDOSODQWFRP P XQLWHVIQJRRG HFROJIFDOFRQGLWRQ H[KIEWLQJ WWRQJ VRLOVORSHWWEIDI]IQJ FKDUDFWUWWFV5HGXFLQJ WKHVSUHDG RI SIQ RQ WQLSHUH[SDQWRQ ZRRGDQGV DQG RUWKHUWDQWWRQ WR IQFUHDVIQJ WWH GRP IQDWG WDWWV IVH[SHFWG WR VXWWIQ DQG WWP XDWKHUDFHRXSODQWYIJ RU P DIQWIQ ZDWUIQIQWDWRQ FDSDFIW DQG UHGXFH VRIO HUVIRQ SRWQWDO5HG HWDO 3IHUVRQ HWDO &RQIHUFRP SHWWRQ ZLWK VKUXEV JUDVHVDQG IRUEVZRXOG EHUHGXFHG SUHVHYIQJ DQG SURSDJ DWQJ WKHVHSHFIHV ZKIFKDUH HVSHFIDOO IP SRUWQWRUZ IOOOIHDQG P D UHXXOWQ DFKDQJHIQ WKHFXUHQWYHJHWDWRQ FRP P XQLW WR DVJHEUXVK WSH

Noxious Weeds, Invasive, and Non-native Plant Species

6 XUUFHGLVXUEDQFHLFWXUWDYHOFRXOG UHXOWQ HXWEOXKP HQWRU\SUHDG RI XQGHVLUDEOH HHG \SHFLHV : HHG SRSXODWRQVKDYHQRWEHHQ LGHQWLHG DVP DWRUWKUHDWX YHJ HWDWRQ FRP P XQLWHVLQ WKH+ & &8 (3 DUHD ([LVWQJ FRQWROP HDVXUHV 6HFWRQ WKHFXUHQWQR[IRXVZ HHG P DQDJ HP HQVSQDQ DQG UHFDP DWRQ DFWLWHVDSSHDUWKDYHEHHQ HIIHFWXHHDWP LQIP I]LQJ QHZ LQIHWDWRQVDQG WKH\SUHDG RI H[LVWQJ ZHHGVDW+ & &8 (3

1 R[IRXVDQG LQYDVLYHZ HHG FRQWROP HDVXUHVGHWHUPLQG LQ6HFWRQ Z HUHIP SOPP HQWG GXUQJ WKH VXUUFHGLVXUEDQFHDVRFLDWG ZLWK+ & &8 (3 H[SORUDWRQ 8 QGHUWKH3URSRVHG $ FWRQ WKHQR[IRXVDQG LQYDVLYHZ HHG FRQWROP HDVXUHVZ RXOG FRQWQXHWR EHIP SOPP HQWG 7KHQR[IRXVZ HHG P DQDJ HP HQVSQDQ (6&2 Z RXOG EHIRORZ HG DQG DQQXDOYHJ HWDWRQ LQYHQWRU\ HIRUWZ RXOG FRQWQXH Z KIFK LQFOXGHP RQLWRULQJ H[LVWQJ Z HHG SRSXODWRQVDQG LGHQW\ LQJ QHZ SRSXODWRQV : HHG FRQWROP HDVXUHVLQFOXGHSUHYHQWDWRQVWR UHGXFH WKH FKDQFHRI VSUHDGLQJ VHHGVIURP YHKIFOHWDIIF 7KLVZ RXOG LQFOXGHDYRLGLQJ NQRZ Q DUHDVRI QR[IRXVZ HHGV LQYDVLYH DQG QRQ QDWYHSQDQWVSHFLHVGXULQJ SHUURGVZ KHQ WKH FRXOG EHVSUHDG E\ YHKIFOHV &RP SOLDQFHZ LWK WKHQR[IRXVZ HHG P DQDJ HP HQVSQDQ Z RXOG HQVXUH H[SORUDWRQ DFWLWHVIRORZ SURSHU%/ 0 SURWRFROHJ DLGLQJ LQYDVLYH QRQ QDWYHZ HHGV

,P SOPP HQWDWRQ RI WKHJ UHDWUVDJ HJ URXVHSIQ RQ NXQLSHUWHDW HQW(30 Z RXOG QRW FRQWUEXWH WR WKHFUHDWRQ RI FRQGLWRQVIDYRUDEOHIRUWKH\SUHDG DQG HWDEOLVKP HQWRI QR[IRXVZ HHGV LQYDVLYH DQG QRQ QDWYHVSHFLHVVLQFHWKHDFWLW GRHVQRWHXOWQJ URXQG GLWXUEDQFHDQG KDQG FUHZ VZ RXOG EH UHTXLUHG WR SUDFWFH%0 3V

2 QJRLQJ + & &8 (3 UHFOP DWRQ DFWLWHVZ RXOG LQFOXGHDSSOLQJ VLW\SHFLLF VHHG P I[HVWR GLWXUEHG DUHDVWR UHGXFH WKHHWXEOXKP HQWRI Z HHG LQHWDWRQVDQG WR LQFUHDVHFRP SHWWRQ DJ DLQWZ HHGV ,WLVQNHO WKDWZ HHG FRQWROHIRUWDQG UHFOP DWRQ FRP SOPWG LQ VXSSRUWRI + & &8 (3 DFWLWHVIQ SUHYRXVO EXLQHG DUHDVKDYHIP SURYHG YHJ HWDWRQ FRQGLWRQV : LWK FRQWQXHG IP SOPP HQWDWRQ RI WKHZ HHG FRQWROHIRUWDQG RQJ RLQJ UHFOP DWRQ DFWLWHV Z HHGV DUHQRWDQWFLSDWG WR KDYHDP DWUHIHFWRQ YHJ HWDWRQ FRP P XQLWHVDW+ & &8 (3

1 R$ FWRQ

1 R DGGLWRQDOXUDFHGLVXUEDQFHZ RXOG EHDOORZ HG XQGHUWKH1 R $ FWRQ$ OWHUQDWYH 2 SHQ DQG DFWYHDUHVZ RXOG EH UHFOP HG RQFHH[SORUDWRQ DFWLWHVDUHFRP SOPWG 1 R QHZ GLVXUEDQFHZ RXOG EHDOORZ HG 1 R[IRXVDQG LQYDVLYHZ HHG FRQWROP HDVXUHVZ RXOG FRQWQXHWR EHIP SOPP HQWG 7KH1 R $ FWRQ$ OWHUQDWYHZ RXOG QRWHXOWQIP SLFWWR YHJ HWDWRQ

&XP XODWYH(IIHFW

Proposed Action

7KHFXUHQWXUDFHGLVXUEDQFHDWRFDWG Z LWK+ & &8 (3 H[SORUDWRQ LVFRQWGHUHG UHDWYHWR VXUDFHGLVXUEDQFHFDXVHG E\ SDWWSUHVHQWDQG5)) $ VOWWG LQ **7 DEOH** 7KHFXP XODWYH DWHWP HQWDOR FRQWGHV YHJ HWDWRQ DIIHFWG E\ WKH IILHV Z KIFK IP SLFWG DQ HWWP DWG DFUHVRI WKHFXP XODWYHDWHWP HQWDUH 7RWDOXUDFHGLVXUEDQFHHWWP DWG IURP WKHVH

RWKHUSDWWSUHVHQWDQG5)) $ VHTXDOV DFUHV 7KLVWRWDOGRHVQRWDFFRXQWRUDFUHV UHFODLP HG

7KH3URSRVHG$ FWRQRI DFUHVRI VXUIDFHGLVWXUEDQFHDWRFDWHG Z LWKH[SORUDWRQ DFWLYLWHV DW+ & &8 (3 LVDSSUR[IP DWH) SHUFHQWRI WKHGLVWXUEDQFHDSSURYHG RUSURMHFWG Z LWKLQ WKH FXP XODWLYHDVHVP HQWDUHD 7KH3URSRVHG$ FWRQRI DQDGGLWRQDO DFUHVRI VXUIDFH GLVWXUEDQFHZ RXOG WRWDODSSUR[IP DWH) SHUFHQWRI WKHGLVWXUEDQFHDSSURYHG RUSURMHFWG Z LWKLQ WKHFXP XODWLYHDVHVP HQWDUHD 7KH3URSRVHG$ FWRQIRU+ & &8 (3 IQFOXGHV UHFODP DWRQ DQG Z HG FRQWROP HDVXUHV Z KIFK Z RXOG SUHYHQW WRQ WLP UHMGXDOHIHFW 7KHUHRUH VJ QLIFDQWFXP XODWLYHIP SDFWVWR YHJHWDWRQ DUHQRWDQWFLSDWHG

No Action

7KH1 R$ FWRQ$ OWHUQDWLYHZ RXOG QRWUHXOWLQIP SDFWVWR YHJHWDWRQ &XP XODWLYHHIHFWZ RXOG QRWRFFXU

) RUHVWU DQG: RRGODQG5 HVRXUFHV

$ IIHFWHG(QYLUQP HQW) RUHVWU DQG: RRGODQG5 HVRXUFHV

) RUHVWU DQG Z RRGODQG UHVRXUFHVIRXQG Z LWKLQ+ & &8 (3 IQFOXGHFRP P HUFLDODQG SHUVRQDO IILUHZ RRG DQG SIQHQXWFRQDFWRQ 9 HJHWDWRQFRP P XQLWHVIQFOXGHG IQ WKHVHDFWLWHVDUH 3IQ RQ-XQLSHU: RRGODQG %XUQHG3IQ RQ-XQLSHU0 RXQWLQ0 DKRJDQ %XUQHG0 RXQWLQ 0 DKRJDQ -XQLSHU: RRGODQG %XUQHG-XQLSHU: RRGODQG 3\ JP \ &RQIHU: RRGODQG &XOOHH 0 RXQWLQ0 DKRJDQ SOXV3IQHV DQG3\ JP \ &RQIHU) RUHVW 9 HJHWDWRQFRP P XQLW GHVFUSWRQVDQG DFUHVDUHGHVFUEHG IQ6HFWRQ 9 HJHWDWRQ5 HVRXUFHV **) IJXUH** GLVSOD\ V FRYHUH[WQWRI YHJHWDWRQFRP P XQLWHVP DSSHG Z LWKLQ+ & &8 (3 3IQ RQ-XQLSHU: RRGODQG LVWHP RWW[WQWLYHRI WKHVHFRP P XQLWHV FRYHUHQJ DSSUR[IP DWH) DFUHV SHUFHQW RI WKH+ & &8 (3 DUHD

7KHSURSRVHG JUHDWUVDJHJURXVH(30 GRHVQRWFRQWXXXWDFRP SUHKHQWLYHSIQ RQ MXQLSHU P DQDJHP HQWSODQIRUWKHSURSRVHG SURMHFWDUHD 7KHSURSRVHG JUHDWUVDJHJURXVH(30 UHSUHHQWVDUHDWXHDWXHH) ORZ FRWWOP LWG VFRSHHIRUWWXUHGXFHRUUHYHUVHHDL0 WWJHSIQ RQ MXQLSHUHQFURDFKP HQWRI JUHDWUVDJHJURXVHKDEWWDQG Z RXOG EHOP LWG H[FXXVLYH) WX HDL0 WWJHH[SDQWRQ Z RRGODQGVDVGHIQHG E\ WKH,QWLP RXQWLQ6RFIHW RI $ P HUFDQ) RUHVWUV ,6$)

(QYLUQP HQWO&RQVHTXHQFHV) RUHVWU DQG: RRGODQG5 HVRXUFHV

3URSRVHG$ FWRQ

([SORUDWRQ DFWLYLWHVKDYHGLVXUEHG DFUHV RU SHUFHQWRI WKH+ & &8 (3 DUHD $ SRUWRQ RI WKLVGLVXUEDQFHIQFOXGHVWKHYHJHWDWRQ FRP P XQLWHVWKDWXSSRUWRUHWU DQG Z RRGODQG UHVRXUFHV 2 I WKHWSHVFRQMGHUHG DVXSSRUWQJ IRUHWU DQG Z RRGODQG UHVRXUFHV WKH%XUQHG 3IQ RQ-XQLSHUWSH Z KIFK P D\ XSSRUWFRP P HUFDODQG SHUVRQQHOIILUHZ RRG FRQWHFWRQ DFWLYLWHV KDVH[SHUHQFHG WKHP DWXUW RI GLVXUEDQFH 7KLVWSHIDVH[WQWLYHIQ WKH+ & &8 (3 DUHD P DSSHG DVFRYHUHQJ DFUHV 2 WKHUGRP IQDQWWSHVIQFOXGH3IQ RQ-XQLSHU: RRGODQG DQG-XQLSHU: RRGODQG Z KIFK FRP EIQHG WRWDO DFUHV ([SORUDWRQ DFWLYLWHVKDYHQRW

UHWXUFWG SXEOLF DFFHVV IRUWKHFRQWQXDWRQ RI IRUHVW DQG Z RRGODQG XVHV $ VWDWHG LQ WKH DSSOLFDQWFRP P LWWG (30 V %DUUFN Z RXOG P LQLP L]HZ KHUHSRWLEOHDQ LQMXU RUUHP RYDORI SLQ RQ SLQH MXQLSHU DVSHQ OP EHUSLQH RUP RXQWQP DKRJ DQ GXUQJ DFWYLWHVDWRFLDWG Z LWK GULOOSDG DQG URDG FRQWXFWRQ 3LQ RQ SLQHDQG MXQLSHUWKDWKDVEHHQ UHP RYHG GXHWR H[SORUDWRQ DFWYLWHVLVP DGHDYDLOEOHWR WKHSXEOLF

7 KHSURSRVHG DGGLWRQDO DFUHVRI DORZ DEOHVXUDFHGLWXUEDQFHP D\ RFFXUZ LWKQ YHJHHDWRQ WSHVWKDWXSSRUWRUHWW DQG Z RRGODQG UHRXUFHV %DUUFN Z RXOG FRQWQXHW IP SOPP HQWWKHIRUHWW DQG Z RRGODQG UHRXUFHVDSSOLFDQWFRP P LWWG (30 7 KH+ & &8 (3 DUHD Z RXOG QRWEHUHWWUFWG IURP SHUP LWWEOHXVHV VXFK DVILUHZ RRG FROOHFWRQ DQG SLQHQXW FROOHFWRQ

7 KHSURSRVHG IP SOPP HQWWRQ RI WKHJ UHDWUVDJHJ URXVH(30 FRXOG DIIHFWDSSUR[IP DWW DFUHVRI SLQ RQ MXQLSHUFRP P XQLW WSHV $ UHDVRI SLQ RQ MXQLSHUZ RRGODQGVIGHQWIHG DV HQFURDFKLQJ ILQRX VDJHEUXVK FRP P XQLW WSHV 3KDVH, DQG,, Z RXOG EHWKHIRFXVRI WKLV(30 Z KIFK P D\ UHXXOWQ DFKDQJHILQ WKHYHJHHDWRQ FRP P XQLW WX D VDJHEUXVK WSH 7 UHHVFXWQ DWRFLDWRQ Z LWK WKH3URSRVHG $ FWRQ Z RXOG EHDYDLOEOHQRWRQ\ IRUSHUVRQDOKDUYHWXWDOR IRUFRP P HUFLDOXVHXQGHUDFRP P HUFLDOGHDGZ RRG SHUP LW $ FFHVVIRUSXEOLF FROOHFWRQ RI Z RRGODQG SURGXFWZ RXOG QRWEHUHGXFHG

1 R$ FWRQ

1 R DGGLWRQDOVXUFHGLWXUEDQFHZ RXOG EHDOORZ HG XQGHUWKH1 R $ FWRQ$ OWHUQDWYH 7 KH1 R $ FWRQ$ OWHUQDWYHZ RXOG QRWUHXOWQ IP SLFWWRI IRUHVW DQG Z RRGODQG UHRXUFHV

&XP XODWYH(IIHFW

Proposed Action

2 WKHUSDWWSUHVHQWDQG5)) $ VOXWG LQ **7 DEOH** KDYHUHXXOWG LQ VXUFHGLWXUEDQFH 7 KH FXP XODWYHDWHWP HQWFRQVLGHUV YHJHHDWRQ DIIHFWG E\ WKH IIUHV Z KIFK IP SDFWG DQ HWP DWG DFUHVRI WKHFXP XODWYHDWHWP HQWUHD 7 RWDOXUFHGLWXUEDQFHHWP DWG IURP WKHWHRWKHUSDWWSUHVHQWDQG5)) $ VHTXDOV DFUHV 7 KLVWRWDOGRHVQRWDFFRXQWRU DFUHVUHFODIP HG

7 KH3URSRVHG $ FWRQ RI DFUHVRI VXUFHGLWXUEDQFHDWRFLDWG Z LWK H[SORUDWRQ DFWYLWHV DW& & &8 (3 LVDSSUR[IP DWW SHUFHQWRI WKHGLWXUEDQFHDSSURYHG RUSURWHFWG Z LWKQ WKH FXP XODWYHDWHWP HQWUHD 7 KH3URSRVHG $ FWRQ RI DQ DGGLWRQDO DFUHVRI VXUFHGLWXUEDQFHZ RXOG WRWDO DFUHV RUDSSUR[IP DWW SHUFHQWRI WKHGLWXUEDQFHDSSURYHG RU SURWHFWG Z LWKQ WKHFXP XODWYHDWHWP HQWUHD 7 UHVFXWQ DWRFLDWRQ Z LWK WKHSURSRVHG SURWHFWZ RXOG EHDYDLOEOHQRWRQ\ IRUSHUVRQDOKDUYHWXWDOR IRUFRP P HUFLDOXVHXQGHUD FRP P HUFLDOGHDGZ RRG SHUP LW $ GGLWRQDOO SLQ RQ MXQLSHUUHVZ LWKQ DQG VXURXQGLQ WKH SURWHFWUHD Z RXOG UHP DLQ RSHQ WX FRP P HUFLDO&KUUWW DV WKHDQG SLQHQXWFROOHFWRQ ' XH WX WKHVHUHDRQV DQG IP SOPP HQWQ WKH(30 V IP SDFWRQ IRUHWW UHRXUFHV Z RXOG EHYHU OP LWG XQGHUWKH3URSRVHG $ FWRQ 6LJQLIFDQWFXP XODWYHHIIHFWW WX IRUHWW DQG Z RRGODQG UHRXUFHV DUHQRWDQWFLSDWG

No Action

7KH1R$FWRQ$OWHUQDWLYHZRXOG&RQWLQXH&XUUHQW&RQGLWLRQ SDFWVWKIRUHWW DQG ZRRGDQG UHVRXUFHVDQG FXP XODWLYHHIIHFWZRXOG&RQWRFFXU

6RLOV

7KLVVHFWRQGHVFUEHVWKHDIIHFWG HQYLURQP HQWRUFRQVLGHUDWRQRI GLUHFWLQGLUHFWDQG FXP XODWLYHIP SDFWVWR VRLOV 7KHGLUHFWDQG LQGLUHFWDQD VLVFRQVLGHUVVRLOUHVRXUFHVIRXQG ZLWLQWKH+&&8(33DQERXQGDU 7KHFXP XODWLYHDQDOVLVFRQVLGHUVSURYMFWWKDWKDYH FDXVHG VXUIFHGLVWXUEDQFHZLWLQ DJHRJUDSKLF DUHDWKDWQFRUSRUDWWVWKHVRXWZHVWLQ SRUWRQ RI 3LQH9DOOH WKHVRXWKHLQ SRUWRQ RI &UHVFHQW9DOOH DQG WKHQRUWKHLQ SRUWRQ RI *UDV 9DOOH

$IIHFWG(QYLURQP HQW&RLOV

6RLOVLQWKH+&&8(3DUHDKDYHEHHQP DSSHG DQG GHVFUEHG E\ WKH1DWXUDO5HVRXUFHV &RQVHUYDWRQ6HUYLFH 15&6 LQWKHVRLOVXUYH\VRI(XUHND 15&6 D DQG/DQGHU 15&6 E FRXQWWV1HYDGD 7KHUHDUH VRLOP DS XQLWVWRFLDWRQVLQWKH+&&8(3DUHD **)LJXUH** $FUHDJHVIRUWKHVHXQLWVDQG DEUH VXP P DU\ RI P DS XQLWFKDUDFWHUWLWWFVDUH VKRZQLQ**7DEOH**)XOOGHVFUSWRQVRI WKHLQGLYLGXDORRLOP DS XQLWVDUHDYDLODEOHRQOLQHDV 6RLO6XUYH*HRJUDSKLF'DWDEDVH 6685*2 UHSRUWV

$IIHOGLQYHVWW DWRQRI VRLOVLQ+&&8(3Z DVFRP SOHWG LQ 60,7+ 7KH RRFDWRQVRI VRLOWWVSLWDUHVKRZQRQ**) LJXUH** 7KHREMFWWYHVRI WKHLQYHWW DWRQZ HUHWR HYDOXDWWKHJURXQG FRQGLWRQVLGHQWLIHG LQWKH15&6 VRLOP DS XQLWDQG YHUI\ WKHYHJHWWRQ FRP P XQLWHVRFFXUUQJ DFURVWKHGLIIHUHQWRLOV5HXOWDUHSUHHQWG EHORZ LQ**7DEOH** 7KH FRP SOHWWIIHOG UHSRUWHQWWG*Soils Investigation of the Horse Canyon-Cortez Unified Exploration Project Plan of Operations Area in Eureka County and Lander County, Nevada* 60,7+ LVDYDLODEOHLQWKHSURMFWUHFRUG

7KH+&&8(3DUHDLVDJH) FRP SULVHG RI VRLOVGHULYHG IURP WKIDFHRXVVDQGWRQHDQG OP HWRQHDQG LJ QHRXVURFNV RFFXUUQJ DVUHMGXXP DQG FRQXYLXP GHSRVLWWKDWRFFXS\ P RGHUDWWR VWHS KLOOVORSHVDWKLJ KHUHOHYDWRQV ,QJ HQHUDO WKHVH VRLOVDUHFRDUVHDQG Z HO) GUDLQHG DVKDOORZ UHWWLFWXHD\ HUIVFRP P RQ 2 U DQIF P DWUDOLQ WKHVH VRLOVIVORZ OHWVWKDQ ILYHSHUFHQW 6RLODWRFDWRQVP D\ FRQWWQ P ICRUORHWDQG YRGFDQIF DVK GHSRWWIQ DGGLWRQ WR UHMGXXP DQG FRQXYLXP $ COXYDOGHSRWWRFFXS\ DP ICRUFRP SRQHQWRI WKH+&&8(3DUHD RFFXUUQJ IQ YDOOH\ ERWRP VDQG OOZ HUHOHYDWRQV 7KHVH VRLOVWQG WR EH GHHS P RGHUDWW) SHUP HDEOH DQG Z HO)GUDLQHG

0DNRU/DQG5HVRXUFH$UHDVDQG(FRORJLFDO6LWWV

0DNRU/DQG5HVRXUFH$UHDV 0/5$V DUHJ HRJUDSKLFDO) DVRFLDWG ODQG UHVRXUFHXQLWXXVHG IQ WWWWZ IGHDQG UHJIRQDOSODQQLQJ ,QWKHODQG UHVRXUFHKLHUDUFK\ 0/5$VIDOOZ LWKQ D/DQG 5HVRXUFH5HJIRQ /55 DQG DUHFRP SULVHG RI VP DOOHU/DQG5HVRXUFH8QLW /58V RU &RP P RQ5HVRXUFH$UHDV &5$V 15&6 7KH+&&8(3DUHDFRQWWQVSRUWRQVRI WKUHH 0/5$V0/5$ ±+XP EROGV$UHD 0/5$ ±2Z\KHH+LJK3ODWDX DQG0/5$ %±

&HQWDO 1 HYDGD %DVQ DQG 5 DQJ H : DWLQ HDFK RI WKHVH 0 / 5 $ VDUHQXP HURXVHFRORJ IFDOWWV (FRORJ IFDOWWV SURYLGHD FRQWWQWUP HZ RUN IRUGHVFUEIQJ DQG FODWLI\ IQJ UDQJ HDDQG DQG IRUHWDDQG VRLOVDQG YHJ HWDWRQ DWRFLDWRQV (FRORJ IFDOWWGHVFUSWRQV (6' V DUHZ UWWQ IRU WKHIQGLYLGXDOHFRORJ IFDOWWVZ KIFK FRP SULVHWKHOUJ HU 0 / 5 $ XQLW 7 KH(6' VSURYLGH IQIRUP DWRQ WR HYDOXDWWWKHODQG DVWR Z KHWKHUWWV VXLWEOHIRUYDURXVODQG XVHV FDSDEOHIRI UHVSRQGIQJ WR GIIHUHQWP DQJ HP HQWFWWLWHVRUGLWXUEDQFHSURFHWVHV DQG Z KHWKHUWWV DEOHWR VXWWQ SURGXFWWLW RYHUWKHORQ WWLP 1 5 &6 (FRORJ IFDOWWV DUHVXEGLYLWRQVRI QDWXUDOODQGVFDSHVWKDWDUHGIIHUHQWDWG IQ WWLP VRI WKHKLWRUF FOP DI SODQWFRP P XQLW RUJ IQDORUQDWXUDOSRWQWDO WKH DUHFDSDEOHIRI VXSSRUWQJ $ QHFRORJ IFDOWWLV WKHSURGXFW RI DOORI WKHHQYLURQP HQWDOIFWRUV UHVSRQMEOHIRUIWGHYHORSP HQWQFXGIQJ VRLOV WRSRJ UDSK\ FOP DW DQG IILH 8 1 5

(6' VDUHFXUHQW EHQJ UHYLVHG IRUWKH+ & &8 (3 DUHD EXWDUHQRW HWIIQDORUDSSURYHG E\ WKH1 5 &6 DQG DUHXQDYDLODEOHIRUSXEOF GLVWUEXWRQ DWWKLVWP H 8 1 5 7 KHEHWW DVDLODEOHIQIRUP DWRQ RQ HFRORJ IFDOWWVZ DVREWWQHG IURP WKH668 5 * 2 UHSRUW (FRORJ IFDO VLWWV DUHOWWG IRUHDFK VRLOP DS XQLWWQ **7 DEOH**

6RLOV) IHG, QYHQWRU

6RLOWWVSLWZ HUHGXJ E\ KDQG DW OREDWRQVSUH GHWUP IQHG WKURXJK DGHWWRS UHYLHZ RI WKH (6&2 YHJ HWDWRQ GDWDDQG 1 5 &6 VRLOP DS XQLW 60 ,7 + 6RLOVZ HUHFODWLIIHG WR WKH VHUHVOHYHO 6DP SOHVZ HUHREWWQHG IURP HDFK KRUI]RQ IRUSXUSRVHVRI FKDUDFWWUI]IQJ WKH KRUI]RQ DQG WR GHWWP IQH VXLWWEIQDW RI WKHVRIOIRUSODQWJ URZ WK

6HYHQWHQ RI WKH SURIIOHVGHVFUEHG DUHQRWDQDP HG FRP SRQHQWVRIOVHUHV RI WKH1 5 &6 VRIOP DS XQLW60 ,7 + ' IIHUHQFHVDUHVXP P DUI]HG IQ **7 DEOH** Z KIFK OWWWKHVRIO VDP SOHSIWQXP EHU VRIOVHUHVP DSSHG IQ WKHIIHOG DQG 1 5 &6 VRIODWWRFDWRQ 7 KHGIIHUHQFHV DUHUHDWWYHV P IQRUDQG H[SODIQDEOHGXHWR WKHIDFWWKDWI 5 &6 P DSSHG DWRFDWRQVDUHQRW GHUYHG IURP IIHOG GDW EXWDWKHUUHP RWW VHQWHG GDWDQG DQGVFDSH VFDOHIQWWSUHWWRQVRI J HRORJ \ DQG WWSRJ UDSK\

) LJXUH 1 5 &6 6RLO$ VWRFNDWRQVDQG 6RLO3 LW/ RFDWRQV

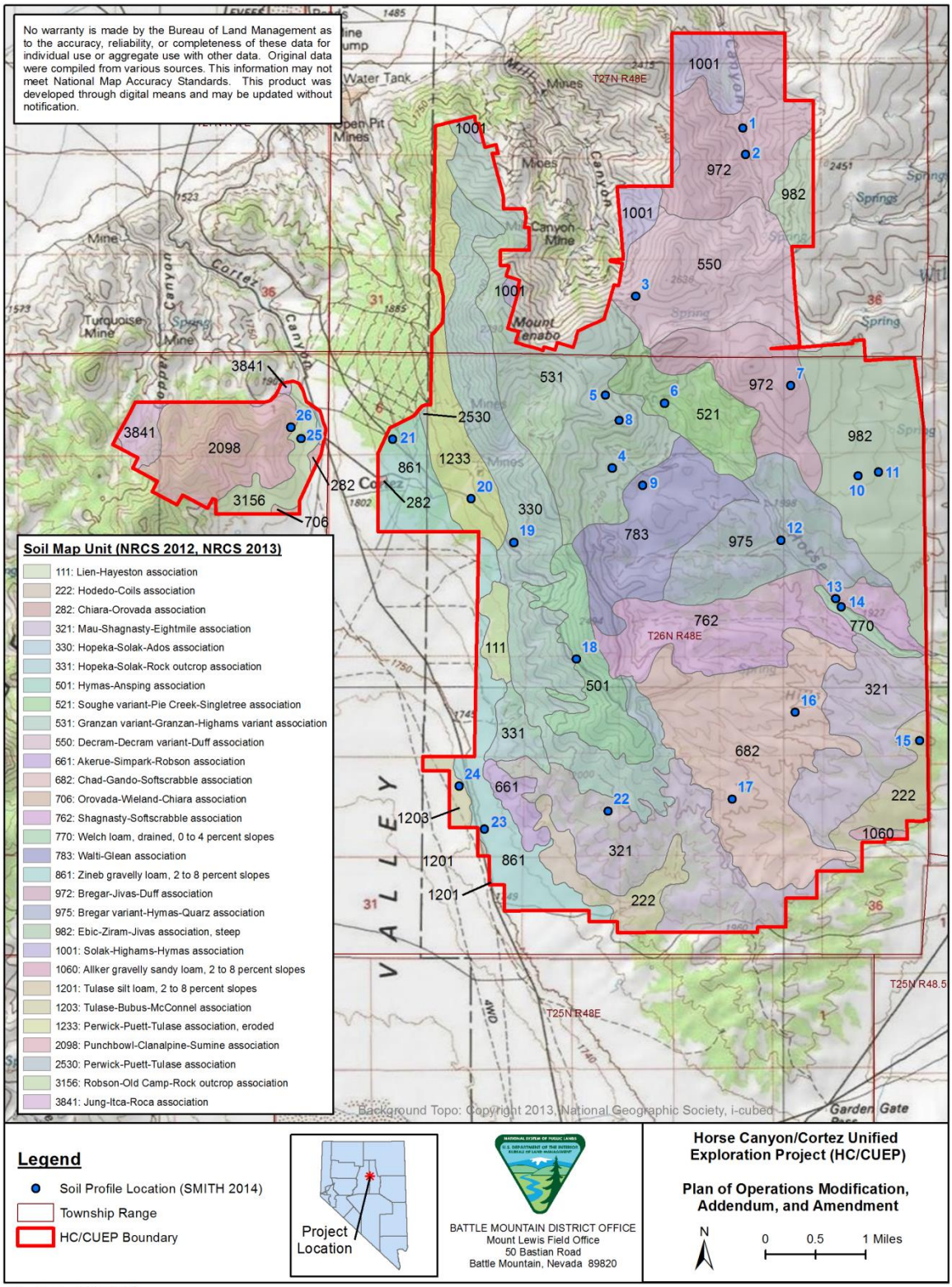


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Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$ VVRFLDWLRQ P DS XQLW DQG (FRORJLFDO6 LWHV &KDUDFWHULVWLFV $ FUHV 3 HUFHQW 7 RWDO
0 DX 6KDJ QDWW (LJ KW LQHDWLRQ
0 DX SHUFHQW *R028BY007NV Loamy 10-12 P.z* HFRORJLFDOVLWH
6KDJ QDWW DQG (LJ KW LQH *F024XY049NV Pinus monophylla-Juniperus osteosperma/Artemisia tridentata ssp. vaseyana / Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDO VLWH
5 HVLGXXP DQG FRORXYLXP GHULYHG IURP YRODQLF URFNV LJ QHRXVDQG P HWP RUSKLF GHSWKV WR DURRW UHVWULFWLYH OD\HU EHGURFN OWHLF LV WR ICFKHV Z HOGUDLQHG VKUICN VZ HOSRWQWDOLVORZ WR P RGHUDW HOD\HU ,QFOXGHVVP DOOUHDVRI RSHQ DQG DFWLYH UHFRQWRXUHG VHGHG
+ RSHND 6RODN $ GRVDWRFLDWRQ
+ RSHND DQG $ GRV *F024XY051NV Pinus monophylla-Juniperus osteosperma / Artemisia nova /Achnatherum thurberianum Pseudoroegneria spicata ssp. spicata* HFRORJLFDOVLWH
6RODN *R028BY016NV Shallow Calcareous Slope 8-10 P.z.* HFRORJLFDO VLWH
&RORXYLXP DOXYLXP DQG UHVGXXP GHULYHG IURP OP HWRQHDQG GRORP ITW GHSWKWR DURRWUHWWLFWLYH OD\HU OWHLF LV WR ICFKHV + RSHND WR ICFKHV 6RODN SHWRFDOFLF LV WR ICFKHV $ GRV Z HOGUDLQHG VKUICN VZ HOO SRWQWDOLVORZ
&KDG * DQGR 6RIWFUDEEOHDWRFLDWRQ
&KDG *R028BY027NV Shallow Calcareous Slope 14+ P.z* HFRORJLFDO VLWH
* DQGR *R028BY034NV Mountain Ridge 12-14 P.z.* HFRORJLFDOVLWH
6RIWFUDEEOHW *R028BY030NV Loamy 12-16 P.z.* HFRORJLFDOVLWH
5 HVLGXXP GHULYHG IURP P I[HG URFNV ORHVDQG YRODQLF DVK GHSWK WR DURRWUHWWLFWLYH OD\HU EHGURFN SDUDOOWLF LV WR ICFKHV Z HOO±GUDLQHG VKUICN VZ HOSRWQWDOLVORZ * DQGR DQG 6RIWFUDEEOH WR KLJK &KDG FRP SRQHQWRQ\
*** UDQJDQ YDUDQW* UDQJDQ + LJKDP V YDUDQWDWRFLDWRQ**
* UDQJDQ YDUDQW *R028BY042NV Mahogany Thicket* HFRORJLFDOVLWH
* UDQJDQ *R025XY009NV South Slope 12-14 P.z.* HFRORJLFDOVLWH
+ LJKDP V *R025XY024NV Mountain Ridge* HFRORJLFDOVLWH
5 HVLGXXP DQG FRRXYLXP GHULYHG IURP OP HWRQHDQG FDOFDUHRXV VKDOH GHSWKWR DURRWUHWWLFWLYH OD\HU EHGURFN SDUDOOWLF LV WR ICFKHV OWHLF LV WR ICFKHV Z HOGUDLQHG VKUICN VZ HOSRWQWDOLVORZ ,QFOXGHVUHFRQWRXUHG VHGHG URDGV
%UHJDU - LYDV' XII DWRFLDWRQ
%UHJDU *R025XY024NV Mountain Ridge* HFRORJLFDOVLWH
-LYDV *R025XY009NV South Slope 12- 14 P.z.* HFRORJLFDOVLWH
' XII *R025XY012NV Loamy* 5 HVLGXXP DQG FRRXYLXP GHULYHG IURP YRODQLF URFNVDQG TXDUWZLWH GHSWKWR DURRWUHWWLFWLYH OD\HU EHGURFN OWHLF LV WR ICFKHV %UHJDU WR ICFKHV -LYDV Z HOGUDLQHG VKUICN VZ HOSRWQWDOO

Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$ VVRFLDWLRQ P DS XQLW DQG (FRORJLFDO6LWHV &&KDUDFWHULVWLFV $ FUHV 3 HUFHQW 7 RWDO
Slope 12-16 P.z. HFRORJLFDOVLWH ,VOHZ VRP RGHUDWH ' XII ,QFOXGHVRSHQ DQG DFWLYH UHFRQRXLHG VHGGDUHDV
(EIF =ILDP - LYDVDWRFLDWRQ VWHS (EIF DQG =ILDP *R025XY017NV Claypan 12-16 P.z.* HFRORJLFDOVLWH -LYDV *R025XY009NV South Slope 12-14 P.z.* HFRORJLFDOVLWH 5 HVGXXP DQG FRORXYLXP GHULYHG IURP YRODQLF URFNV GHSVKRXD URRW UHVWLFWXYHOD HU EHGURFN OXWLF LV VR ICFKHV =ILDP Z HOGUDLQHG VKUICQ VZ HOSRWQXOO LVP RGHUDWH VRORZ -LYDV
' HFUDP ' HFUDP YDUDQW XII DWRFLDWRQ ' HFUDP DQG' HFUDP YDUDQW *R025XY024NV Mountain Ridge* HFRORJLFDOVLWH ' XII *R025XY012NV Loamy Slope 12-16 P.z* HFRORJLFDOVLWH 5 HVGXXP GHULYHG IURP TXDUWLW FKHUWDQG YRODQLF URFNV GHSVKRXD URRWHHWXFWXYHOD HU EHGURFN OXWLF LV VR ICFKHV VR ICFKHV ' XII Z HOGUDLQHG VKUICQ VZ HOO SRWQXOOLVORZ VR P RGHUDW ' XII
6 KDJ QDW 6 RIWFUDEEOH DWRFLDWRQ 6 KDJ QDW *F024XY049NV Pinus monophylla-Juniperus osteosperma/ Artemisia tridentata ssp. vaseyana/ Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDO VLWH 6 RIWFUDEEOH *R028BY030NV Loamy 12-16 P.z.* HFRORJLFDOVLWH 5 HVGXXP DQG FRORXYLXP GHULYHG IURP LJ QHRXVDQG P HWP RUSKIF URFNV GHSVKRXD URRWHHWXFWXYH OD HU EHGURFN SDUDOXWLF LV VR ICFKHV J UHDWUWDQ ICFKHV 6 RIWFUDEEOH Z HOGUDLQHG VKUICQ VZ HOSRWQXOOLVORZ VR P RGHUDW ,QFOXGHVRSHQ DQG DFWLYHUHD
=ICQHE JUDYHOO ORDP VR SHUFHQWORSHV =ICQHE *R025XY019NV Loamy 8-10 P.z.* HFRORJLFDOVLWH $ COXYLXP GHULYHG IURP P IL HG URFNV DQG YRODQLF DVK GHSVKRXD URRW UHVWLFWXYHOD HUIVJ UHDWUWDQ ICFKHV Z HOGUDLQHG VKUICQ VZ HOO SRWQXOOLVORZ
%UHJ DUYDUDQW+ \ P DV 4 XDU DWRFLDWRQ %UHJ DUYDUDQW DQG+ \ P DV *F024XY049NV Pinus monophylla-Juniperus osteosperma/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH 4 XDU *R025XY009NV South Slope 12-14 P.z.* HFRORJLFDOVLWH 5 HVGXXP DQG FRORXYLXP GHULYHG IURP P IL HG URFNV %UHJ DUYDUDQW DQG 4 XDU DQG OP HVWRQH + \ P DV GHSVKRXD URRWHHWXFWXYHOD HU EHGURFN OXWLF LV VR ICFKHV %UHJ DUYDUDQWDQG+ \ P DV VR ICFKHV 4 XDU VRP HZ KDW H FHWLYHO GUDLQHG %UHJ DUYDUDQW DQG Z HOGUDLQHG + \ P DVDQG 4 XDU VKUICQ VZ HOSRWQXOOLV ORZ %UHJ DUYDUDQWDQG+ \ P DV DQG P RGHUDW 4 XDU ,QFOXGHVRSHQ DQG DFWLYH UHFRQRXLHG VHGGDUHDV
: DOW* OHDQ DWRFLDWRQ &RORXYLXP DQG UHVGXXP GHULYHG

Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$ VVRFLDWRQ P DS XQLW DQG (FRORJLFDO6 LWHV &KDUDFWHULVWLFV $ FUHV 3 HUFHQW 7 RWDO
: DOW *R028BY037NV Claypan 12-14 P.z.* HFRORJLFDOVLWH * OHDQ *R028BY030NV Loamy 12-16 P.z.* HFRORJLFDOVLWH
IURP YRODQLF URFNV GHSVRVLWV DURRW UHVLVWDQW HO) HU EHGURFN OLWWOH LV VW ICFKHV VW ICFKHV * OHDQ Z HO)GUDLQHG VKUICQ VZ HO) SRWHQWDOOVKLJ K : DOW VW ORZ * OHDQ ,QFOXGHVVP DOOLHDVRI RSHQ DQG DFWLYH UHFRQVWXUHG VHGHG
3 XQFKERZ O&ODQDSLQH6 XP ICH DVVRFLDWRQ 3 XQFKERZ O *R024XY030NV Shallow Calcareous Loam 8-10 P.z.* HFRORJLFDOVLWH &ODQDSLQH *F024XY054NV Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH 6 XP ICH *R024XY029NV South Slope 12-16 P.z.* HFRORJLFDOVLWH
5 HVLGXXP Z HDWHUHG IURP P I[HG 3 XQFKERZ ODQG 6 XP ICH FRORXYLXP GHULYHG IURP YRODQLF URFN DQG RUUHVLGXXP Z HDWHUHG IURP YRODQLF URFN &ODQDSLQH DQG FRORXYLXP GHULYHG IURP P I[HG 6 XP ICH GHSVRVLWV DURRWHHWWLFWXYH OD) HU EHGURFN OLWWOH LV VW ICFKHV 3 XQFKERZ O DQG VW ICFKHV 6 XP ICH SDUDOOWLF LV VW ICFKHV &ODQDSLQH Z HO) GUDLQHG VKUICQ VZ HO)SRWHQWDOOV ORZ 3 XQFKERZ ODQG 6 XP ICH DQG P RGHUDW &ODQDSLQH
3 HUZ IFN 3 XHHW7 XOD\HDVRFLDWRQ HURGHG 3 HUZ IFN DQG 3 XHHW *F025XY059NV Juniperus osteosperma/ Artemisia tridentata ssp. wyomingensis /Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH 7 XOD\H *R025XY019NV Loamy 8-10 P.z.* HFRORJLFDOVLWH
5 HVLGXXP GHULYHG IURP OD)XXWLCH GHSRVLWV DQG VLOWVRCH DQG UHVLGXXP DQG FRORXYLXP GHULYHG IURP VHGLP HQWXU URFNV DQG VWL GHSVRVLWV DURRWHHWWLFWXYH OD) HU EHGURFN SDUDOOWLF LV VW ICFKHV Z HO) GUDLQHG VKUICQ VZ HO)SRWHQWDOO LV ORZ
+ RGHGR &RLOVDVRFLDWRQ + RGHGR *F024XY049NV Pinus monophylla-Juniperus osteosperma /Artemisia tridentata ssp. vaseyana / Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH &RLOV *R028BY007NV Loamy 10-12 P.z.* HFRORJLFDOVLWH
$ COXYLXP GHULYHG IURP P I[HG URFNV YRODQLF DQG VHGLP HQWXU GHSVRVLWV DURRWHHWWLFWXYH OD) HU GXUSDQ LV VW ICFKHV Z HO)GUDLQHG VKUICQ VZ HO)SRWHQWDOOLVKLJ K
+ \ P DV$ QVSLQJ DVRFLDWRQ + \ P DV DQG $ QVSLQJ *F024XY049NV Pinus monophylla-Juniperus osteosperma/ Artemisia tridentata ssp. vaseyana/ Pseudoroegneria*
5 HVLGXXP DQG FRORXYLXP GHULYHG IURP OD P HVRCH GHSVRVLWV UHVLVWDQW OD) HU EHGURFN OLWWOH LV VW ICFKHV DQG DOOXYLXP DQG FRORXYLXP GHULYHG IURP OD P HVRCH VHGLP HQWXU DQG YRODQLF URFNV

Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$ VVRFLDWLRQ P DS XQLW DQG (FRORJLFDO6LWHV &KDUDFWHULVWLFV $ FUHV 3HUFHQW 7RWDO
spicata ssp. spicata-Achnatherum thurberianum HFRORJLFDOVLWH
6RXJKHYDUDQW3LH&UHHN 6LQJOHWHH DVVRFLDWLRQ
6RXJKHYDUDQW *F024XY049NV Pinus monophylla-Juniperus osteosperma/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH
3LH&UHHN *R025XY018NV Claypan 10-12 P.z.* HFRORJLFDOVLWH
6LQJOHWHH *R025XY012NV Loamy Slope 12-16 P.z.* HFRORJLFDOVLWH
6RODN + LJKDP V+ \ P DVDVVRFLDWLRQ
6RODN *R028BY016NV Shallow Calcareous Slope 8-10 P.z.* HFRORJLFDO VLWH
+ LJKDP V *F024XY051NV Pinus monophylla-Juniperus osteosperma/Artemisia nova/Achnatherum thurberianum Pseudoroegneria spicata ssp. spicata* HFRORJLFDOVLWH
+ \ P DV *F024XY049NV Pinus monophylla-Juniperus osteosperma/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH
5 REVRQ 2 OG &DP S 5 RFN RXWURS DVVRFLDWLRQ
5 REVRQ *R024XY018NV Claypan 10-12 P.z.* HFRORJLFDOVLWH
2 OG FDP S *R024XY005NV Loamy 8-10 P.z.* HFRORJLFDOVLWH
5 RFN RXWURS
+ RSHND 6RODN 5 RFN RXWURS DVVRFLDWLRQ
+ RSHND *F024XY051NV Pinus monophylla-Juniperus*

&KDUDFWHULVWLFV $ FUHV 3HUFHQW 7RWDO
GHSWKWR DURRWHWWLFWLYHOD\HU GXUSDQ LV WR ICFKHV ZHO) GUDLQHG VKUIQ VZHO0SRWQWDOLV OBZ
5HVGXXP GHUYHG IURP P I[HG URFNV 6RXJKHYDUDQWDQG WXI 3LH &UHHN DQG UHVGXXP DQG FROOXYLXP GHUYHG IURP LJ QHRXVURFNV OBHW DQG YROFDQLF DVK 6LQJOHWHH GHSWK WR DURRWHWWLFWLYHOD\HU EHGURFN SDUDOOHOF LV WR ICFKHV 6RXJKHYDUDQW WR ICFKHV 6LQJOHWHH OWLF LV WR ICFKHV 3LH&UHHN ZHO)GUDLQHG VKUIQ VZHO0SRWQWDOLVKUJK 6RXJKHYDUDQWDQG3LH&UHHN DQG OBZ 6LQJOHWHH ,QFOXGHVRSHQDQG DFWLYH UHFRQWRXUHG VHHGHG DUHDV
5HVGXXP DQG FROOXYLXP GHUYHG IURP P I[HG URFNV 6RODN DQG OP HVWRQH + \ P DV DQG UHVGXXP GHUYHG IURP OP HVWRQHDQG GROBP LWH + LJKDP V GHSWKWR DURRW UHWWLFWLYHOD\HU EHGURFN OWLF LV WR ICFKHV VRP HZKDW H[FHVLYHO) GUDLQHG 6RODN DQG ZHO)GUDLQHG + LJKDP VDQG + \ P DV VKUIQ VZHO0SRWQWDOLV OBZ 6RODN DQG + \ P DV DQG P RGHUDWH + LJKDP V
5HVGXXP ZHDWHUHG IURP LJ QHRXV URFN 5 REVRQ DQG FROOXYLXP GHUYHG IURP YROFDQLF URFN DQG RU UHVGXXP ZHDWHUHG IURP YROFDQLF URFN 2 OG FDP S GHSWKWR DURRW UHWWLFWLYHOD\HU EHGURFN OWLF LV WR ICFKHV ZHO)GUDLQHG VKUIQ VZHO0SRWQWDOLVP RGHUDWH 5 REVRQ DQG OBZ 2 OG &DP S
5HVGXXP DQG FROOXYLXP GHUYHG IURP OP HVWRQHDQG GROBP LWH + RSHND DQG P I[HG URFNV 6RODN GHSWKWR DURRWHWWLFWLYHOD\HU EHGURFN OWLF LV WR ICFKHV

Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$ VVRFLDWLRQ P DS XQLW DQG (FRORJLFDO6LWHV &KDUDFWHULVWLFV $ FUHV 3 HUFHQW 7 RWDO
osteosperma/Artemisia nova/Achnatherum thurberianum Pseudoroegneria spicata ssp. spicata HFRORJLFDOVLWH 6RQDN *R028BY016NV Shallow Calcareous Slope 8-10 P.z.* HFRORJLFDO VLWH 5RFNRXWURS
$ NHUXH6LP SDUN 5 REVRQ DVWRFLDWLRQ $ NHUXH DQG6LP SDUN *R028BY016NV Shallow Calcareous Slope 8-10 P.z.* HFRORJLFDOVLWH 5REVLQ *R028BY037NV Claypan 12-14 P.z* HFRORJLFDOVLWH
- XQJ , WH D 5 RFD DVWRFLDWLRQ -XQJ *R028BY016NV Shallow Calcareous Slope 8-10 P.z.* HFRORJLFDO VLWH , WH D *F024XY054NV Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDOVLWH 5RFD *R024XY028NV South Slope 8-12 P.z.* HFRORJLFDOVLWH
/ LHQ + D\ HVWRQ DVWRFLDWLRQ / LHQ *F024XY051NV Pinus monophylla-Juniperus osteosperma /Artemisia nova /Achnatherum thurberianum Pseudoroegneria spicata ssp. spicata* HFRORJLFDOVLWH / LHQ *R028BY011NV Shallow Calcareous Loam 8-10 P.z.* HFRORJLFDO VLWH + D\ HVWRQ *R028BY010NV Loamy 8-10 P.z.* HFRORJLFDOVLWH
7 XOD\H %XEXV0 F&RQQHOD VWRFLDWLRQ 7 XOD\H DQG0 F&RQQHO *R024XY005NV Loamy 8-10 P.z.* HFRORJLFDOVLWH %XEXV *R024XY002NV Loamy 5-8 P.z.* HFRORJLFDOVLWH
: HOORK &RDP GUDLQHG WR SHUHQQLDOSHV

&KDUDFWHULVWLFV $ FUHV 3 HUFHQW 7 RWDO
+ RSHND DQG WR ICFKHV 6RQDN Z H0GUDLQHG + RSHND DQG VRP HZ KDWH[FHVLYH0 GUDLQHG 6RQDN VKUIQN VZ H0SRWQWDOLV OZ
5HVGXXP GHUYHG IURP YRFDQLF URFNVDQG TXDUWLWH GHSWK WR DURRW UHVWULFWLYH0 HU GXUSDQ LV WR ICFKHV Z H0GUDLQHG VKUIQN VZ H0 SRWQWDOLVOZ WR P RGHUDW
&RORXUXP GHUYHG IURP YRFDQLF DQG VHGLP HQWDU URFN DQG RU UHVGXXP Z HDWHUHG IURP YRFDQLF DQG VHGLP HQWDU URFN GHSWK WR D URRWUHVWULFWLYH0 HU EHGURFN OWHLF LV WR ICFKHV , WH DQG -XQJ WR ICFKHV 5RFD Z H0 GUDLQHG VKUIQN VZ H0SRWQWDOLV P RGHUDW
$ OXYLXP GHUYHG IURP P LI[HG URFNV OHHVDQG YRFDQLF DVK GHSWK WR D URRWUHVWULFWLYH0 HU GXUSDQ LV WR ICFKHV Z H0GUDLQHG VKUIQN VZ H0SRWQWDOLVOZ
$ OXYLXP GHUYHG IURP P LI[HG URFNV OHHVDQG YRFDQLF DVK GHSWK WR D URRWUHVWULFWLYH0 HU LJ UHDW U WHDQ ICFKHV Z H0GUDLQHG VKUIQN VZ H0SRWQWDOLVOZ
$ OXYLXP GHUYHG IURP YRFDQLF URFNV GHSWK WR D URRWUHVWULFWLYH

Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$VVRFLDWLRQ PDS XQLWV DQG (FRORJLFDO 6LWHV	&KDUDFWHULVWLFV	$FUHV	3HUFHQW 7RWDO
: HGFK LV LQ WKH *R028BY024NV Loamy Bottom 14+ P.z* HFRORJLFDO VLWH	OD\HU LV JUHDWHU WKDQ LQFKHV P RGHUDWHO\ ZHOO GUDLQHG VKULQN VZHOO SRWHQWLDO LV P RGHUDWH ,QFOXGHV VP DOO DUHDV RI RSHQ DQG DFWLYH UHFRQWRXUHG VHHGHG		
$OOHQ JUDYHOO\ VDQG\ ORDP WR SHUFHQW VORSHV $OOHQ 5 ;< 1 9 / RDP \ 3] HFRORJLFDO VLWH	$OOXYLXP GHULYHG IURP P L[HG URFNV DQG ORHVV GHSWK WR D URRW UHVWULFWLYH OD\HU LV JUHDWHU WKDQ LQFKHV ZHOO GUDLQHG VKULQN VZHOO SRWHQWLDO LV ORZ		
&KDUD 2 URYDGD DVVRFLDWLRQ &KDUD DQG 2 URYDGD *R024XY005NV Loamy 8-10 P.z.* HFRORJLFDO VLWH	$OOXYLXP GHULYHG IURP P L[HG &KDUD DQG ORHVV RYHU DOOXYLXP GHULYHG IURP P L[HG 2 URYDGD GHSWK WR D URRW UHVWULFWLYH OD\HU LV JUHDWHU WKDQ LQFKHV 2 URYDGD GXULSDQ LV WR LQFKHV &KDUD ZHOO GUDLQHG VKULQN VZHOO SRWHQWLDO LV ORZ		
2 URYDGD : LHGDQG &KDUD DVVRFLDWLRQ 2 URYDGD : LHGDQG DQG &KDUD *R024XY005NV Loamy 8-10 P.z.* HFRORJLFDO VLWH	/ RHVV RYHU DOOXYLXP GHULYHG IURP P L[HG 2 URYDGD YROFDQLF DVK DQG RU DOOXYLXP GHULYHG IURP P L[HG DQG RU ORHVV : LHGDQG DQG DOOXYLXP GHULYHG IURP P L[HG &KDUD GHSWK WR D URRW UHVWULFWLYH OD\HU LV JUHDWHU WKDQ LQFKHV 2 URYDGD DQG : LHGDQG GXULSDQ LV WR LQFKHV &KDUD ZHOO GUDLQHG VKULQN VZHOO SRWHQWLDO LV ORZ 2 URYDGR DQG &KDUD DQG P RGHUDWH : LHGDQG		
3HZ LFN 3XHWW 7XOOHH DVVRFLDWLRQ 3HZ LFN %) DQG 3XHWW *F025XY059NV Juniperus osteosperma/Artemisia tridentata ssp. wyomingensis/Pseudoroegneria spicata ssp. spicata-Achnatherum thurberianum* HFRORJLFDO VLWH 7XOOHH *R024XY005NV Loamy 8-10 P.z.* HFRORJLFDO VLWH	5 HVLGXXP Z HDWKHUHG IURP VHGLP HQWDU\ URFN DQG RU WXII 3HZ LFN DQG 3XHWW FROOXYLXP GHULYHG IURP WXII DQG RU VHGLP HQWDU\ URFN 3XHWW YROFDQLF DVK DQG RU DOOXYLXP GHULYHG IURP P L[HG DQG RU ORHVV 7XOOHH GHSWK WR D URRW UHVWULFWLYH OD\HU LV JUHDWHU WKDQ LQFKHV 7XOOHH EHGURFN SDUDOLWKLF LV WR LQFKHV 3HZ LFN WR LQFKHV 3XHWW Z HOO GUDLQHG VKULQN VZHOO SRWHQWLDO LV ORZ		
7XOOHH VLOW ORDP WR SHUFHQW VORSHV *R025XY019NV Loamy 8-10 P.z.* HFRORJLFDO VLWH	$OOXYLXP GHULYHG IURP P L[HG URFNV ORHVV DQG YROFDQLF DVK GHSWK WR D URRW UHVWULFWLYH OD\HU LV JUHDWHU WKDQ LQFKHV Z HOO GUDLQHG		

Table 3-6 NRCS Soil Associations and ESDs of the HC/CUEP Area

$ VWRFNDWRQ P DS XQLW DQG (FRORJLFDO6 LWHV &KDUDFWHULVWLFV $ FUHV 3 HUFHQW 7 RWDO
VKULQN VZ HOOS RWHQWDOOLVORZ
7 2 7 $ /

7 DEOH) LHOG, QYHVWLJDWRQ 6 RLO3 URILOHV± 6 RLO0 DS 8 QLWV 5 HODWRQVKLSV

6 RLO 3 URILOH	6 RLO6 HULHV &OODVVLILFDWRQ VW) DP LOO
	%DGKDS &UHJ DU-LYDV' XI $ VWRFNDWRQ 0 DS 8 QLW
	%DGKDS &UHJ DU-LYDV' XI $ VWRFNDWRQ 0 DS 8 QLW
) DLU GHO0	' HFUDP ' HFUDP 9 DUDQW XI $ VWRFNDWRQ 0 DS 8 QLW ' IIHUHQWHUHV EXW QRWGHHSHUIDP LO GHHSHUWK EHGURFN
0 DGHDQH	* UDQ DQ9 DUDQW* UDQ DQ + LJ KDP V9 DUDQW$ VWRFNDWRQ 0 DS 8 QLW 6IP LODU WK + LJ UDP V9 DUDQWE XWOD\ HUR KDLG EHGURFN DWOHVWKDQ LQFKHV YHUXVOD\ HU RI VRIWEHGURFN GIIHUHQWDP LO
%DGKDS	* UDQ DQ9 DUDQW* UDQ DQ + LJ KDP V9 DUDQW$ VWRFNDWRQ 0 DS 8 QLW 7 HP SHUDXUHUHJ IP HIRXQG Z LWK WKH%DGKDS LVFU IF UDWHUWKDQ IUJ IG Z KIFK LV FRQVLWHQWZ LWK WKSRJ UDSKIF ORFDWRQ RI VRLOSIW
* OHDQ	6 RXJ KH9 DUDQW3 IH&UHN 6 LQJ OHWHH$ VWRFNDWRQ 0 DS 8 QLW 1 RWFRQVLWHQW Z LWK DQ\ VHUHHVIQ WKH1 5 &6 P DS XQLW VRLOSORWQ ODQGIRUP GUDLQDJ HVZ DOH QRW FRQVLWHQWZ LWK VXUURXQGLQJ ODQGVFDSH
-LYDV	%UHJ DU-LYDV' XI $ VWRFNDWRQ 0 DS 8 QLW
%DOOUGJ H	* UDQ DQ9 DUDQW* UDQ DQ + LJ KDP V9 DUDQW$ VWRFNDWRQ 0 DS 8 QLW 6IP LODU WK* UDQ DQ 6 HUHV EXWOD FNVD FDOHIF KRUJ RQ VRLOSIWVIQ ODQGIRUP WSIFDORI P DS XQLW
/ RQH	: DOW* OHDQ $ VWRFNDWRQ 0 DS 8 QLW 1 RWOD NHDQ\ VHUHHVIQ 1 5 &6 P DS XQLW ODQGIRUP LVWSIFDO GIIHUVE\ IQFOXGLQJ DGXUSDQ DW IQFKHVIQWWDG RI EHGURFN
(EIF	(EIF = ILUP -LYDV$ VWRFNDWRQ WWHS 0 DS 8 QLW
(EIF	(EIF = ILUP -LYDV$ VWRFNDWRQ WWHS 0 DS 8 QLW
3 IH&UHN	%UHJ DU9 DUDQW+ \ P DV 4 XDJ $ VWRFNDWRQ 0 DS 8 QLW 6IP LODU WK 4 XDJ EXW GIIHUVGXH WK SHUFHQWRI URFN IUDJ P HQWVIOHWVIQ 3 IH&UHN
6 KDJ QDW	6 KDJ QDW 6 RIWFUDP EOH$ VWRFNDWRQ 0 DS 8 QLW
: HOPK	: HOPK / RDP VORSHV 0 DS 8 QLW
+ RGHGR	%UHJ DU-LYDV' XI $ VWRFNDWRQ 0 DS 8 QLW 6IP LODU WK -LYDV 6 HUHV EXWGIIHUV GXH WK OR Z HUSHUFHQWJ HRI URFN IUDJ P HQW SUHVHQFHRI GXUSDQ DQG J UHDWHUWKDQ FOD\ IQ DU J ILOOF KRUJ RQ WKHUHRUH * UHDW* URXS GIIHUV
6 RIWFUDEEOH	&KDG * DQGR 6 RIWFUDEEOH$ VWRFNDWRQ 0 DS 8 QLW
&KDG	&KDG * DQGR 6 RIWFUDEEOH$ VWRFNDWRQ 0 DS 8 QLW
+ RSHND	+ \ P DV $ QVSIQJ $ VWRFNDWRQ 0 DS 8 QLW 6IP LODU WK + \ P DV EXWGIIHUVGXH WK OOFN RI P ROOF HSISHGRQ Z KIFK FKDQJ HV WKH2 UGHU
+ RSHND	+ RSHND 6 ROON $ GRV$ VWRFNDWRQ 0 DS 8 QLW
&URRNWRQ 9 DUDQW	3 HZ IFN 3 XHW7 XOOVH$ VWRFNDWRQ (URGHG 0 DS 8 QLW 8 QOONHFRP SRQHQW RI 1 5 &6 P DS XQLWP RUHVIP LODU WK 7 XOOVH 6 HUHV EXWWKOGIIHUVE\ SDUWFOHVI H FOOVV SUHVHQFHRI GXUSDQ DQG P ROOF HSISHGRQ WKHUHRUH2 UGHUVGIIHUHQWWKDQ 7 XOOVH ODQGIRUP LVWSIFDORI P DS XQLW
%DQQIRQ	= IQHE J UDYHOO ORDP VORSHV 0 DS 8 QLW 6IP LODU WK = IQHE H[FHHSWRU

		SUHVHQFHRI GXUSDQ UDWHUWDQ RQ\ GXUF P DWUDO Z KIFK FKDQJ HV VXERUGHU
	/ RQH	0 DX 6KDJ QDW (LJ KW/ LOH$ VWRFLDWRQ 0 DS 8 QLW 6IP LODUWR0 DX H[FHSW IRUSUHVHQFHRI GXUSDQ UDWHUWDQ RQ\ GXUF P DWUDO OHWVFOD\ DQG OD\FN RI DJ LOOF KRU]RQ WKHUHRUH VXERUGHUFKDQJ HV
	&HZ DW	=LQHE J UDYHO0 ORP VORSHV 0 DS 8 QLW 6IP LODUWR=LQHE H[FHSWRU OD\FN RI GXUF P DWUDO Z KIFK FKDQJ HV VXEJ URXS
	7 XL$IQ	7 XOD\H %XEXV0 F&RQQHO$ VWRFLDWRQ 0 DS 8 QLW
	5 REVRQ	5 REVRQ 2 OG &DP S 5 RFN 2 XWURS $ VWRFLDWRQ 0 DS 8 QLW
	6 XP LQH	3 XQFKERZ O&OD\DS$LQH 6 XP LQH$ VWRFLDWRQ 0 DS 8 QLW

(QYLRQP HQWDO&RQVHTXHQFHV6RLOV

3 URSRVHG $ FWRQ

([SORUDWRQ DFWLYLWHV GLVXUE WKH VRLOVXUDFH LQFUHDVLQJ WKHSRWQWDOIRUHURVLRQ IURP Z LQG DQG Z DWU &RP SDFWRQ RI VRLOVP D\ UHGXFHQXWLHQWXSWXNHDQG DHUDWRQ DQG FDXVHUHGXFHG LQLOWDWRQ UDWHV DQG LQFUHDVHG UXQRII

7 KHUHDUHFXUUHQW DFUHVRI VXUDFHGLVXUEDQFHLQ WKH+ & &8 (3 DUHD 2 I WKH DFUHVRI VXUDFHGLVXUEDQFH DFUHVKDYHEHHQ UHFRQRXUHG DQG UHVHGHG KRZ HYHU QRQHRI WKLV DFUHDJ HKDVEHHQ UHOHDVHG IURP WKHUHFOP DWRQ DWXUDQFHE\ WKH%/ 0 RUWKH1 ' (3 7 KH P DWUW RI + & &8 (3 VXUDFHGLVXUEDQFHKDVRFFXUUHG LQ WKH+ RUVH&DQ\ RQ DUHD 6RLOVLQ WKH + RUVH&DQ\ RQ DUHD DUHJ HQHUDO0 Z H0OGUDLQHG Z LWK OPZ WX P RGHUDWH VKUIQN VZ HOOSRWQWDO (URVLRQ FRQWROD\G FRP SDFWRQ SUHYHQWRQ P HDVXUHVIQ WKHVHDUHDVKDYHEHHQIP SOHP HQWG DV WWQGDG SUDFWFH 6RP HVRLOVIQ WKHXSSHUUHFKHVRI + RUVH&DQ\ RQ DUHFKDUFWUL]HG DVKDYIQJ DKJ K VKUIQN VZ HOOSRWQWDOD\G DUHIRXQG IQ DFOD\ SDQHFRQJ IFDOWW : DOW8 QLWRI WKH: DOW * OHDQ$ VWRFLDWRQ *R028BY037NV Claypan 12-14 P.z.* HFRQRJ IFDOWW 3IH&UHN8 QLWRI WKH6RXJ K YDUDQW3IH&UHN 6IQJ OHWHH$ VWRFLDWRQ *R025XY018NV Claypan 10-12 P.z.* HFRQRJ IFDOWW 7 KHVHDUHDVP D\ EHP RUHSURQHWX FRP SDFWRQ DQG IQFUHDVHG UXQRII

$ SSOFDQWFRP P LWWG(30 VWX SUHYHQWDGYHDVHHIHFWWX VRLOV VXFK DV VRLOORWDQG FRP SDFWRQ KDYHEHHQIP SOHP HQWG XQGHUWKH3URSRVHG $ FWRQIRUWKH DFUHVRI GLVXUEDQFH DQG DUHIQFOXGHG IQ WKH3URSRVHG $ FWRQIRUWKHDGGLWRQDO DFUHVRI VXUDFHGLVXUEDQFH 6HFWRQ (URVLRQ DQG UXQRII FRQWROP HDVXUHV VXFK DVZ DWUEDUV GLWKIQJ DQG RWKHU Z DWUFRQWROWXFWXUHV DUH XVHG IQ DUHDVRI VXUDFHGLVXUEDQFH (URVLRQ SUHYHQWRQ %0 3VDQG J HQHUDOH[SORUDWRQ %0 3VDUHRXWQHG IQ WKH+ & &8 (3 3DQ DQG IQFOXGHG DVSDUWRI WKH 3URSRVHG $ FWRQ **$ SSHQGL %**

5 HFOP DWRQ DFWLYLWHV RXWQHG IQ 6HFWRQ DOR P IQIP I]HWKHSRWQWDOIRUVRLORWDQG FRP SDFWRQ $ IWUWKH H[SORUDWRQ SURJ UP LVFRP SOHWG IQ DQ DUHD WKHVXUDFHGLVXUEDQFHLV UH J UDGHG FRQWXUHG DQG DYDLDE OHWWS VRLOJ URZ WK P HGLXP LVUHSOFHG 6HHGLQJ LVFRP SOHWG XVLQJ WKHVLWW DSSURSUDWP I[DQG DP RXQW 6HFWRQ 5 HYHJ HWWRQ DFWLYLWHV DUH FRP P HQFHG DWWKH HDOOHWWHDWE OHWWP HIRORZ IQJ H[SORUDWRQ DFWLYLWHV

8 QGHUWKH3URSRVHG $ FWRQ RI WKH H[LWWQJ GLVXUEDQFHRI DFUHV WKHGLVXUEDQFHFRQWXXWV SHUFHQWRI WKH DFUHVRI VXUDFHDUHD Z LWKLQ WKH+ & &8 (3 ERXQGDU\ 7 KH3URSRVHG

$ FWRQ RI DQ DGGLWRQDO DFUHVRI VXUIDFHGLWXUEDQFHZ RXOG FRQWXXXWDQ DGGLWRQDO SHUFHQWRI WKHWRWDOVXUIDFHDFUHDJHZ LWKLQ WKH+ & &8 (3 ERXQGDU\ 7KHSRWHQWDOIRUVRLOORW DQG FRP SDFWRQ Z RXOG EHP LQIP I]HG Z LWK IP SOHP HQWDWRQ RI WKHDSSOLFDQWFRP P LWWG(30 V %0 3V DQG UHFOD DWRQ SUDFWFHV ,P SDFWVWX VRLOVDVDUHXXOWRI WKH3URSRVHG$ FWRQ Z RXOG EH P LQIP DO

7KHSURSRVHG IP SOHP HQWDWRQ RI WKHJ UHDWUVDJHJ URXVH(30 FRXOG DIIHFWDSSUR[IP DWW DFUHVRI WXQLSHUFRP P XQLW WSHV $ UHDVRI OLYHSLQ RQ WXQLSHUZ RRGDDQ LGHQWIHG DV HQFURDFKLQJ LQWX VDJHEUXVK FRP P XQLW WSHVZ RXOG EH WKHIRFXVRI WKLV(30 + DQG UHP RYDO WFKQLTXHVZ RXOG EHXVHG WX P LQIP I]HIP SDFWVWX VRLOV 7KHYHJHWDWRQ WXHDW HQWZ RXOG QRW UHXXOWQ DGGLWRQDOXUIDFHGLWXUEDQFH 3LQ RQ WXQLSHUHQFURDFKP HQWLQWX VDJHEUXVK WWSSH SURP RWWVZ DWUDQG VRLOORWVE\ LQFUHDVLQJ EDUHJ URXQG FRQHFWXYLW DQG LP SOL\ LQJ UXQRII ,QLWDOWHHHQFURDFKP HQWP LQIP DO IP SDFWUXQRII DQG HURVRQ EXWFRQWXXHG HQFURDFKP HQW P D\ FDXVHDVKLIWURP DUHRXUFH FRQVHUYLQJ WX DQRQ FRQVHUYLQJ WXXW 6LWWVRQ VRLOVZ LWK LQKHUHQW OWZ LQILOWDWRQ DQG KJ K HURGLEILOW P D\ UDSLGO WXDQWRUP WX DQRQ FRQVHUYLQJ WXXW SDUWFXOD\ XQGHUGURXJ KWFRQGLWRQV DVWHHGRP LQDQFHSURP RWWVEDUHVRLOEHWZ HHQ WHHVDV Z HOD\VFRQQHFWXYLW EHWZ HHQ EDUHDUHDV 5 XQRII DQG HURVRQ LQFUHDVHH[SRQHQWOO Z KHUHEDUH VRLOH[FHHGV SHUFHQW3 IHUVRQ HWDO %\ IP SOHP HQWQJ WKHJ UHDWUVDJHJ URXVH(30 DV SDUWRI WKH3URSRVHG$ FWRQ SLQ RQ WXQLSHUWHDW HQWDP HQWDP HG DWP DLQWQLQJ DQG IP SURYLQJ VKUXE DQG KHUEFHRXVFRYHUDQG WXXFWXUH P D\ DOR LQFUHDVHLQLILOWDWRQ DQG DJ J UHJ DWWWXEILOW 3IHUVRQ HWDO

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ$ OWHUQDWYH H[SORUDWRQ Z RXOG RFFXURQ\ IQ RSHQ DQG DFWYHDUHDV XQGHU WKHWHUP VDQG FRQGLWRQVRI FXUHQVSHUP LWDQG DSSURYDOV 5 HFOP DWRQ SUDFWFHVZ RXOG FRP P HQFHDVH[SORUDWRQ DFWYLWHVDUHFRP SOHWG 7KHDSSOFDQWFRP P LWWG(30 VDQG %0 3V IRUHURVRQ FRQWRO Z RXOG FRQWXXHWX EHIP SOHP HQWG DQG UHOD DWRQ Z RXOG FRQWXXHXQGHU WKHFXUHQWUHOD DWRQ SHUP LW,P SDFWVWX VRLOVZ RXOG EHP IQIP DO

&XP XODWYH(IIHFW

Proposed Action

7KHH[LWWQJ VXUIDFHGLWXUEDQFHDVRFLDWG Z LWK+ & &8 (3 H[SORUDWRQ RI DFUHVDQG WKH SRWWXWDOIRUDQ DGGLWRQDO DFUHVRI VXUIDFHGLWXUEDQFHLVFRQVLGHUHG UHDWYHWX VXUIDFH GLWXUEDQFHFDXVHG E\ SDWWSUHVHQWDQG5)) $ VOWWG IQ **7 DEOH** 7RWWOVXUIDFHGLWXUEDQFH HWWP DWG IURP WKHRWKHUSDWWSUHVHQWDQG5)) $ VHIXDOV DFUHV 7KLVWRWOGRHVQRW DFFRXQWRUDFUHVUHFOD P HG

7KH3URSRVHG$ FWRQ RI H[LWWQJ VXUIDFHGLWXUEDQFHRI DFUHVZ LWKLQ WKH+ & &8 (3 3DQ ERXQGDU\ LVDSSUR[IP DW\ SHUFHQWRI WKHGLWXUEDQFHDSSURYHG RUSURYHFWG Z LWK RWKHUSDWW SUHVHQWDQG5)) $ VZ LWKLQ WKHFXP XODWYHDVHWWP HQWDUHD 7KH3URSRVHG$ FWRQ IRUDQ DGGLWRQDO DFUHVZ LWKLQ WKH+ & &8 (3 3DQ ERXQGDU\ Z RXOG EHDSSUR[IP DW\ SHUFHQW P RUHGLWXUEDQFHUHOD DWYHWX WKHGLWXUEDQFHDSSURYHG RUSURYHFWG Z LWK RWKHUSDWW SUHVHQWDQG 5)) $ VZ LWKLQ WKHFXP XODWYHDVWHWP HQWDUHD 7KHWHP RXQWDUHQHJ DQ IE0H 7KH+ & &8 (3

3DQ Z RXOG FRQWLQXH WR IP SOHP HQWWKH DSSOLFDQWFRP P LWWG (30 V %0 3V DQG UHFOP DWRQ WR SUHYHQWWKRUWWLP DQG ORQJ WLP HIIHFWWR VRLOV 6LJQLIFDQWFXP XODWLYHIP SDFWWR VRLOVDUH QRWDQWFLSDWG

No Action

7KH1 R$ FWRQ$ OWLQDWLYHZ RXOG IP SOHP HQWWKH DSSOLFDQWFRP P LWWG (30 V %0 3V DQG UHFOP DWRQ WKURXJK FRP SOHWRQ RI H[SORUDWRQ DFWLYLWHVIQ WKHUHP DIQIQJ RSHQDQG DFWLYHDUHDV (IIHFWZ RXOG EHVIP IODUWR WKH3URSRVHG$ FWRQ EXWSURSRUWRQDOO VP DOOHU

: IOOXOLH5 HWRXUFHV

7KLVVHFWRQ GHVFUEHVWKH DIIHFWG HQYLURQP HQWRUFRQVGHUDWRQ RI GLUHFWLQGLUHFWDQG FXP XODWLYHIP SDFWWR J HQHUDOZ IOOXOLH UHWRXUFHV 6SHFLDOWXXV\VSHFLHVDUHGLVFXVHG IQ6HFWRQ $ QDOVHVRI WKHGLUHFWLQGLUHFWDQG FXP XODWLYHIP SDFWFRQVGHUZ IOOXOLH UHWRXUFHVIRXQG Z LWKLQ WKH+ & &8 (3 3DQ ERXQGDU 6SHFLHV VSHFLIF DQDOVLVDUHDVDUHIGHQWLIHG IRUWKRVH SDWWFXODU VSHFLHV DVDSSOLFDEOH

$ VHSDUDW: IOOXOLH5 HSRUWZ DVSUHSDUHG WR VXSSRUWWKLV($ 7 HWD7 HFK ,WLV IQFRUSRUDWG E\ UHHUHQFHDQG DYDLODEOHIQ WKHSURMHFWUHFRUG 7KHUHSRUWQFXGHVDJ HQF\ FRRUGLQDWRQ DQG GHVFUEHVNH KDEWWVIQ WKH+ & &8 (3 DUHD P HWRGVDQG UHXXOWIURP EDVHOLQH IIHOG VXUYH V DQG SURYLGHVGHWDLOHG QDXUDOKLWRU IQIRUP DWRQ IRUZ IOOXOLH VSHFLHVWKDW DUHH[SHFWG RUNQRZ Q WR RFFXUZ LWKLQ+ & &8 (3

$ IIHFWG (QYLUROP HQW IOOXOLH5 HWRXUFHV

+ DEWWV7 \ SHV

7KH%/ 0 ,0 XVHVWKH 1 HYDGD: IOOXOLH$ FWRQ3DQ : $ 3 : $ 37 WR IGHQW\ Z IOOXOLH VSHFLHVDVWP EOD HVDQG NH KDEWWVIRUDQG XVHSDQQIQJ . H KDEWWVZ HUH IGHQWIHG IQ WKH+ & &8 (3 DUHDE\ UHFDWLI\ IQJ WKHYHJ HWDWRQ WSHVP DSSHG E\ (6&2 (6&2 D WR ITWQWR WKH: $ 3 FDWJ RUHV VHH: IOOXOLH5 HSRUWRUP RUHIQIRUP DWRQ 1 HYDGD : $ 3 NH KDEWWVWSHVIQ+ & &8 (3 IQFXGHVDJ HEUXVK SHUFHQW / RZ HU0 RQWDQH : RRGDDQGVDQG&KDSDUUDO SHUFHQW %XUQHG6DJ HEUXVK SHUFHQW %XUQHG/ RZ HU 0 RQWDQH: RRGDDQGVDQG&KDSDUUDO QIQHSHUFHQW DQG%DUHQ' LWXUEHG IRXUSHUFHQW * UDVDDQGVDQG0 HDGRZ V ,QWLP RXQWLQ5 LYHUVDQG6WHP V DQG5 RFN &OLIVDQG&DQ RQV DUHDVR SUHVHQWEXWFRP SUVHOHWVWKDQ RQHSHUFHQWRI WKH+ & &8 (3 DUHD &DYHV0 IQHVDQG 6SUQJ V6SUQJ EURRNVDUHDVR SUHVHQW

* HQHUDO IOOXOLH

7KH: IOOXOLH5 HSRUWGHVFUEHVELJ J DP H IXUEHDUHV XSDDQG J DP H DQG QRQ J DP H VSHFLHVWKDW P D IQKDEWWKH+ & &8 (3 DUHD 7 HWD7 HFK 7KHP DWXUW RI WKH+ & &8 (3 DUHDIV P DSSHG DV\ HDUURXQG P XOHGHU *Odocoileus hemionus* UDQJH 1 ' 2 : 7KHUHDUHVP DOO DUHDVIQ WKHVRXWKDWWWQ VRXWZ HWWQ DQG Z HWWQ SRUWRQVRI WKH+ & &8 (3 DUHD WKDWUH P DSSHG DV\ HDUURXQG SURQJ KRUQ DQWORSH *Antilocapra americana* KDEWWW1 ' 2 : ,Q DGGLWRQ SURQJ KRUQ Z IQWUUDJ HIVORFDWG DSSUR[IP DWO P IOHVRXWK DQG HDWRI WKH + & &8 (3 DUHD 1 ' 2 :

) LVKHULHV

7 KHUHDUHQR SHUHQQLDOWWHP VDQG WKHUHRUH QR IILVKHULHVRFFXULQ WKH+ & &8 (3 DUHD 7 KH IILVKHULHV UHRXUFHLVQRWGLVFXVVHG IXUWKHULQ WKLV($

(QYLURQP HQWDO&RQVHTXHQFHV: ILGDOH5 HVRXUFHV

3 URSRVHG $ FWLRQ

* HQHUDOIP SDFWVWRZ ILGDOH WKDWP D\ RFFXUDVDUHXOWRI WKH3URSRVHG $ FWLRQ ILQFOXGHKDELWDW ORVVDVDUHXOWRI UHP RYLQJ YHJHWDWLRQ DQG GLVWXUELQJ VRLO DQG GLVWXUEDQFHDVRFFDWHG Z LWK ILQFUHDVHG QRLVH WDIIIF DQG KXP DQ SUHVHQFH + & &8 (3 H[SORUDWRQ DFWLYLWHVKDYH UHXOWHG LQ DFUHVRI VXUIDFHGLVWXUEDQFH Z KIFK HTXDWVWR SHUFHQWRI WKHODQG VXUIDFHZ LWKLQ WKH + & &8 (3 3DQ ERXQGDU\ 7 KHWRWDO DFUHVRI FXUHQWGLVWXUEDQFHILQFOXGHV DFUHVWKDW KDYHEHHQ UHFRQWXUHG DQG UHVHHGHG KRZ HYHU QRQHRI WKLVDFUHDJHKDVEHHQ UHPRYHG IURP WKH UHFOP DWRQ DVXUDQFHE\ WKH%/ 0 RUWKH1 ' (3

7 KHP DWUWRI VXUIDFHGLVWXUEDQFHKDVRFFXUHG LQ WKH+ RUVH&DQ\RQ DUHDILQ WKHVDJHEUXVK EXLQHG VDJHEUXVK OWZ HUP RQWQHZ RRGDQGVFKDSDUUDO DQG EXLQHG OWZ HUP RQWQH Z RRGDQGVFKDSDUUDODQG FRYHUWSHV UHXOWLQJ ILQ DOWVRI WKHVHKDELWDWVIRUZ ILGDOH XVH $ SSOFDQWFRP P LWWG(30 VSURYLGHIRUDYRLGDQFHRI VHHSV VSUQJ VDQG Z HQDQG KDELWDWWKXV WKLVKDELWDWWSHZ DVQOWP SDFWG ([SORUDWRQ DFWLYLWHVWKDWKDYHUHXOWHG LQ WKHFXUUHQW VXUIDFHGLVWXUEDQFHRI DFUHVZ HUHFRQGXFWG DFFRUGLQJ WX WKHDSSOFDQWFRP P LWWG(30 V DQG %0 3VGHWOHG ILQ6HFWRQ DQG WKHUHFOP DWRQ DFWLWHVDSSURYHG XQGHUWKHFXUUHQW + & &8 (3 3DQ ,QSUHYIRXV) EXLQHG DUHDV UHFOP DWRQ RI + & &8 (3 GLVWXEHG DUHDVKDV IP SURYHG Z ILGDOHKDELWDWURP EXLQHG FRQGLWRQV 7 KH DFUHVRI VXUIDFHGLVWXEDQFHIURP H[SORUDWRQ DFWLYLWHVDW+ & &8 (3 DSSHDUWKDYHQRWUHXOWHG LQ P HDXXUEOHIP SDFWWX Z ILGDOH UHVRXUFHV

7 KH3URSRVHG $ FWLRQ RI DQ DGGLWRQDO DFUHVRI VXUIDFHGLVWXEDQFHFRXOG RFFXUDQ Z KHUH Z LWKLQ WKH+ & &8 (3 3DQ ERXQGDU\ 7 KHDFWLYLWHVZ RXOG EHILQFUHP HQWORYHUD \HDU SHURG DQG Z RXOG RFFXULQ ORFDO]HG DUHDVDURXQG GULOOSDGVDQG URDGV ' LVXUEDQFHUHVXOWLQJ IQ KDELWDWORWP D\ RFFXULQ DUHDVXVHG E\ Z ILGDOH: ILGDOHP D\ DOVR EHIP SDFWG E\ KXP DQ SUHVHQFHDQG DVRFLDWG WDIIIF DQG QRLVH UHXOWLQJ IQ VKRUWRUORQJ WLP DYRLGDQFHRI ORFDO]HG DUHDVZ KHUHDFWLYLWHVDUHRFFXULQJ

7 KHH[LWLQJ DFUHVRI VXUIDFHGLVWXEDQFHDQG WKHSURSRVHG DGGLWRQDO DFUHVRI VXUIDFH GLVWXEDQFHFRQLVWWR OQHDURUUHDWWYH) VP DOOSRO J RQ IHDXUHV IQFOXGLQJ DFFHVURDGV GULOO SDGV DQG UHFRQWXUHG VHGHG DUHDV ,WLVH[SHFWG WKDWLQFUHP HQWDOUHGXFWRQ RI VDJHEUXVK DQG Z RRGDQG FKDSDUUDOFRP P XQLWHVIQ ORFDO]HG DUHDVRI + & &8 (3 DVDUHXOWRI WKH3URSRVHG $ FWLRQP D\ DIIHFWZ ILGDOHXVHRI IP P HGLDWH) VXURXQGLQJ KDELWDWZ LWKQ+ & &8 (3 DQGP D\ UHXOWQ KDELWDWUDJ P HQWWRQ 7 KHHIIHFWRI SRWQWOKDELWDWUDJ P HQWWRQ FDXVHG E\ WKH 3URSRVHG $ FWLRQ IVQLNHO) WX EHQHJQDLEOHEHFDXVHRI WKHH[LWLQJ FRQGLWRQ RI WKH+ & &8 (3 DUHD WKHQDXUHRI WKHSURSRVHG GLVWXEDQFHV Z KIFK DUHVP DOOQ WWP VRI ERWKWWOOFUHJHDQG IQGLYGXDOVXUIDFHGLVWXEDQFHV DUHVSDFHG IQ WP H DQG Z RXOG EH UHFOP HG DWDQ RQ J RIQJ EDVLV 7 KLVUHSUHVHQWDVP DOOIQFUHP HQWDOKDELWDWORW SHUFHQWRI OQG FRYHUIQ WKH

+ & &8 (3 ERXQGDULH 7 KHH[LWWQJ VXUIDFHGLVXUEDQFHRI DFUHVKDVDIIHFWHG DSSUR[IP DWH) SHUFHQWRI WKH+ & &8 (3 DUHD 7 KHDGGLWRQDO DFUHVRI VXUIDFHGLVXUEDQFHZ RXOG DIIHFW DQ DGGLWRQDO SHUFHQWRI WKH+ & &8 (3 DUHD

6 XUIDFHGLVXUEDQFHDQG YHKLFXODUWUDIIF KDYHWKHSRWHQWWDOWR FRQWUEXWHWR LQWRGXFWRQ RU VSUHDG RI XQGHUOLDHZ HHG VSHFLHV ([LWWQJ FRQWROP HDVXUHV WKHFXUUHQWQR[IRXVZ HHG P DQDJ HP HQVSDQ DQG WKHUHFDP DWRQ SDQZ RXOG P LQLP I] HZ HHG IP SDFWWR Z LOOOLHKDEIWW ,P SOHP HQWDWRQ RI WKHUHFDP DWRQ SDQZ RXOG UHXOWQ FRQYHUWRQ RI + & &8 (3 GLVXUEHG DUHDV WR KHUEDFHRXVDQG J UDVFRP P XQLWHV XQWDVKUXEVEHFRP HUH HWWEDXKHG DQG UHFK P DXUW ,Q SUHYRXV) EXLQHG DUHDV UHFDP DWRQ RI + & &8 (3 GLVXUEHG DUHDVZ RXOG IP SURYHKDEIWWWURP EXLQHG FRQGLWRQV UHXOWQJ LQ DORQJ WUP SRVLWYHHIHFWRQ Z LOOOLHKDEIWW

$ VSDWRI WKH3URSRVHG$ FWRQ IP SOHP HQWDWRQ RI WKHSIQ RQ MXQLSHURSWRQ RI WKHJ UHDWU VDJ HJ URXVH(30 P D\ FDXVHD VKRUWWUP GLVUXSWRQ RI Z LOOOLHP RYHP HQWDQG KDEIWWXVHDVD UHXOWRI KXP DQ DFWYLW DQG FKDQJZ QRLVH ,QWKHORJ WUP J UHDWUWKDQ RQH\ HDU KDEIWW TXDOW IRUZ LOOOLHZ RXOG EHHQKDQFHG DVXQGHUWRU YHJ HWWRQ SDUWFXDU\ J UDVHVDQG IRUEV DUHSURWFWG IURP FRP SHWWYHH[FXVRQ E\ SIQ RQ MXQLSHU

2 WKHUSURFHGXUHVWR P LQLP I] HIP SDFWWR VSHFLIF Z LOOOLHVSHFLHVDQG RUSDUWFXDUZ LOOOLH KDEIWWYHDXUHVDUHLQFXGHG IQ WKHDSSOFDQWFRP P IWWG(30 VDVSDUWRI WKH3URSRVHG$ FWRQ 6HFWRQ 7 KHVHP HDXUHVDUHGLVFXVHG IQ P RUHGHWDLCEHORZ

Big Game

$ SSUR[IP DWH) SHUFHQWRI WKH\ HDUURXQG P XOHGHHUKDEIWWZ IWKQ+ & &8 (3 KDVEHHQ WP SRUDUL) UHGXFHG DVDUHXOWRI WKH DFUHVRI VXUIDFHGLVXUEDQFHDWRFIDWG Z IWK WKH 3URSRVHG$ FWRQ DFUHVKDYHEHQ UHFRQWRXUHG DQG VHGHG KRZ HYHU QRQHRI WKLVDFUHJ H KDVEHQ UHOHDVHG IURP WKHUHFDP DWRQ DVXUDQFHE\ WKH%/ 0 RUWKH1 ' (3 7 KHSURSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUIDFHGLVXUEDQFHZ RXOG UHXOWQ DUHGXFWRQ RI SHUFHQWRI P XOHGHHUUDQJHZ IWKQ WKH+ & &8 (3 DUHD

1 RIVHDQG KXP DQ SUHVHQFHP D\ OP IWP XOHGHHUSUHVHQFHWP SRUDUL) DQG IQ OR FDO]HG DUHDVRI H[SORUDWRQ DFWYLWHV + RZ HYHU J LYHQ WKHDYDLODEIOW RI VXIWEOHKDEIWWWQ RWKHUDUHDVRI WKH &RUW] 0 RXQWDQVDQG DEIOW RI WKHVSHFLHVWR P RYHUHDWYH) OIJ HGLWWQFHV GIUFWDQG IQGIUFWHIHFWVWR WKHP XOHGHHUKHLG DVDUHXOWRI WP SRUDU\ KDEIWWOR WDUHH[SHFWG WR EH QHJ OJ IEOH ,QDUHDVWKDWKDYHSUHYRXV) EXLQHG UHFDP DWRQ DFWYLWHVKDYHDQG Z RXOG FRQWQXHWR IP SURYHKDEIWWWRUP XOHGHHU 5 HFDP DWRQ IRORZ IQJ FRP SOHWRQ RI H[SORUDWRQ DFWYLWHVZ RXOG IXUWHUP IQIP I] HDQ\ UHMGXDOHIHFW

1 R SURQJ KRLQ KDEIWWKDVEHHQ IP SDFWG E\ WKH DFUHVRI H[LWWQJ VXUIDFHGLVXUEDQFHZ IWKQ WKH+ & &8 (3 ERXQGDUHV 7 KH3URSRVHG$ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUIDFH GLVXUEDQFHFRXOG DIIHFWD VP DOOP RXQWRI \ HDU URXQG SURQJ KRLQ DQWWRSHKDEIWWGHSHQGIQJ RQ Z KHUHGUOQIQJ P D\ RFFXU KRZ HYHU WKHP DWUW RI KDEIWWWRUWKLV\SHFIHVIVOR FDWG IQ DGWFHQW YDOOH\ V &UHVFHQW9 DOOH\ * UDV9 DOOH\ DQG 3IQH9 DOOH\ 7 KHIP SDFWRI KDEIWWOR W QRIVH

DQG KXP DQ SUHVHQFH RQ SURQJ KRUQ Z RXOG EH QHJ DJ LEOH J LYHQ WKDW GLVXUEDQFH WR SUP DU\ KDELWDW LQ WKH YDOOH\ EDVLQ Z RXOG QRW RFFXU

7 KH SUHVHQFH RI YHKLFXODU WUDIIF DV DUHVXOW RI WKH 3URSRVHG $ FWRQ P D\ LQFUHDVH WKH SRWHQWDO IRU ERWK P XOH GHHUDQG SURQJ KRUQ P RUWDOW WR RFFXU IURP P RWRUYHKLFOH IFRODVRQV + RZ HYHU YHKLFOH IFRODVRQV DUH DNHO WR EH LQLUHTXHQWDQG Z RXOG QRW KDYH DP HDXUDEOH LP SDFW RQ WKH RYHUDO &RUW\ 0 RXQWDLQ P XOH GHHUSRSXODWRQ RUSURQJ KRUQ KHLGVRFFXS\ LQJ WKH YDOOH\ EDVLQ 6SHHG OP LWDUHSRVWG DQG YHKLFOH\SHHGVUHGXFHG LQ DUHDVRI GLVXUEDQFH WR P LQLP L]HWKH SRWHQWDO IRU YHKLFOH IFRODVRQV

Small Game/Non-game Species

6P DOOP DP P DOVDQG RWKHUVP DOOQRQ J DP H\SHFLHV VXFK DV UHSWLOHV P D\ H[SHULHQFH GLUHFW P RUWDOW IURP YHKLFOH IFRODVRQVRUHTXLSP HQWP RYLQJ WKURXJ K WKHLUKDELWDWWLQFHLWP D\ EH P RUH GLIIIFXOW RUWKHP WR DYRLG WKHVHLQWXVRQVFRP SDUHG WR OD J HU\SHFLHV + RZ HYHU VP DOO \SHFLHVSRSXODWRQVWQG WR UHFRYHUP RUHTXLFN\ IURP SHUXUEDWRQVGXHWR KJ KHUUHSURGXFWXYH UDWV 7 KHUHRUH P RUWDOWHVWKDWP D\ RFFXUDUHXQOnNH\ WR KDYHORQJ WUP IP SDFWRQ SRSXODWRQV + DELWDWORWZ RXOG EHWP SRUDU\ DQG ORFDO]HG DQG Z RXOG QRWKDYHP HDXUDEOH ORQJ WUP IP SDFWRQ WKHVH\SHFLHVIROORZ IQJ UHFOP DWRQ (IIHFWRQ VP DOOJ DP H QRQ J DP H \SHFLHVZ RXOG EHQHJ OJ LEOH

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ$ OWHUQDWLYH H[SORUDWRQ DQG UHFOP DWRQ DFWLYLWHVZ RXOG RFFXURQ\ IQ RSHQ DQG DFWLYHDUHDV XQGHUWKHWUP VDQG FRQGLWRQVRI FXUHQWSHUP LWDQG DSSURYDOV 7 KH 3URSRVHG $ FWRQ Z RXOG QRWEHDSSURYHG 7 KHUHZ RXOG EHQR DGGLWRQDORWRI KDELWDW 2 QJ RIQJ IP SDFWVWZ ICOOLHZ RXOG EHOP LWG WKGLWXUEDQFHDVRFLDWG Z LWK QRLVHDQG KXP DQ SUHVHQFH 7 KHDSSOLFDQWFRP P LWWG(30 VIRUZ ICOOLHZ RXOG FRQWQXH WR EHIP SOP HQWG Z KIFK Z RXOG P IQIP L]HWKHHIIHFWIURP QRLVHDQG KXP DQ GLWXUEDQFH 5 HFOP DWRQ Z RXOG FRQWQXH Z KIFK Z RXOG UHSOFHKDELWDWDIIHFWG E\ SDWH[SORUDWRQ DFWLYLWHV DQG IP SURYHDUHDV Z KHUHKDELWDWZ DVORWGXHWR SDWWLUHHYHQW

&XP XODWLYH(IIHFW

Proposed Action

: ICOOLHZ RXOG OnNH\ DYRIG ORFDO]HG DUHDVZ LWKQ + & &8 (3 GXUQJ H[SORUDWRQ DFWLYLWHV 2 WKHUSDWWSUHVHQWDQG5)) $ VKDYHOnNH\ FDXVHG RUZ RXOG FDXVHWKHVP HEHKDYIRUDOHIIHFW 6SHFLHVWKDWUHP REOHDQG DEOHWR OYHIQ DYDUHWV RI KDELWDWVFRXOG DGDSWQG SRSXODWRQ OHYHO HIIHFWRUORQJ WUP IP SDFWZ RXOG QRWRFFXU + DELWDWOWUDWRQ DQG WKHIQFUHDVHIQ KXP DQ SUHVHQFHDQG QRLVHZ RXOG RFFXUIRU \HDV SOXVWZ R DGGLWRQDO\ HDUVIRUUHFOP DWRQ 2 QFH H[SORUDWRQ IVFRP SOHWH DQG DUHDVDUHUHFOP HG KDELWDWZ RXOG EHUHWRUHG DQG VSHFLHVZ RXOG OnNH\ UHWXUQ 6IJ QIIFDQWFXP XODWYHHIIHFWWR WKHVHVSHFLHVZ RXOG QRWEHDQWFISDWG

No Action

1 R DGGLWRQDOKDELWWORWZ RXOG RFFXUXQGHUWKH1 R $ FWRQ$ OWHUQDWLYH DQG UHFOP DWRQ Z RXOG J UDGXDOO\ UHWRUHKDELWDWDVH[SORUDWRQ IVFRP SOHWG 1 RLVHDQG KXP DQ SUHVHQFHP D\ FDXVH

Z LOOOOLH VWRGLVSHUVHLQWR RWKHUDUHDV EXWWKLVHLIHFWZ RXOG GLP LQLVK DVH[SORUDWRQLVWLP LQDWG &XP XODWLYH HIIHFWDUHQRWDQWLSDWG

6SHFLDO6WDWXV6SHFLHV

%/ 0 0 DQXDO GHLQHV VSHFLDOWDXV VSHFLHVDV VSHFLHVWKDWDUHOLVWG RUSURSRVHG IRU OLVWQJ XQGHUWH(QGDQJHUHG6SHFLHV$ FW(6$ VSHFLHVOLVWG E\ DVWDWLQDWKUHDWQHG RU HQGDQJHUHG FDWJ RU\ IP SO\LQJ SRWQWDOHQGDQJHUP HQWRUH[WQFWRQ DQG %/ 0 VHQLWYH VSHFLHVDVGHVJQDWG E\ WKH6WDW' ILHFWRU %/ 0 VHQLWYH VSHFLHVDUH VSHFLHVWKDWDUHJLYHQ VSHFLDOP DQDJHP HQWFRQVLGHUDWRQ WR SURP RWWWKHUFRQVHUYDWRQ DQG UHGXFH WKHOLNHOLKRRG DQG QHHG IRUI XWUHOLWQJ XQGHUWH(6$ 7KH6WDWRI 1 HYDGDFOLWLHVZ LOOOOLH VSHFLHVXQGHU 1 $ & DVHQGDQJHUHG SURWFWG VHQLWYH RUWKUHDWQHG

7KH(6$ 6HFWRQ UHTXLUHVIHGHUDODJHQFLHVWR HQVXUHWKDWQ\ DFWYLWHVWKH DXWRU]H IXQG RUFDUU RXWGR QRWWRSDUG]HWKHFRQWQXHG H[LVWQFHRI DQ\ VSHFLHVIHGHUDOO OLVWG RU SURSRVHG IRUOLVWQJ DVWKUHDWQHG RUHQGDQJHUHG $ QRIIFLDO(6$ VSHFLHVOLVWRU+ & &8 (3 (XUHNDDQG/ DQGHUFRXQWHV Z DVREWLQHG WKURXJK WKH8 6) : 6 ,QIRUP DWRQ 3DQQLQJ DQG &RQVHUYDWRQ6\ VWHP ,3$ & Z HEVLWH

$ VHSDUDWH: LOOOOLH5 HSRUWZ DVSUHSDUHG WR VXSSRUWWKLV($ 7HWD7HFK ,WLV LQFRU$RUDWG E\ UHHUHQFHDQG DYDLODEOHLQ WKHSURYLFHVWHFRUG 7KHUHSRUWQFXGHVDJHQF\ FRRUGLQDWRQ DQG GHVFUEHVNH KDEWDWVLQ WKH+ & &8 (3 DUHD P HWKRGVDQG UHXXOWIURP EDVHOLQHIIHOG VXUYH V DQG SURYLGHVGHWDLOHG QDXUDOKLWRU\ LQIRUP DWRQ IRU\SHFLDOWWXV SHFLHVWKDWDUH[SHFWG RUNQRZ QWR RFFXUZ LWKLQ+ & &8 (3

$ IIHFWG(QYLURQP HQW6SHFLDO6WDWXV$ QLP DO6SHFLHV

7KH: LOOOOLH5 HSRUWSURYLGHVDOWWRI VSHFLHVFRQVLGHUHG IRUDQDO\VLVLQ WKLV($ DQG WKH UDWRQDOHIRULQFXVLRQ RUH[FXVLRQ 7HWD7HFK 6SHFLHVZ HUHH[FXGHG EDVHG RQ WKH DEVHQFHRI VXLWDEOHKDEWDWRUEHFDXVHWKH+ & &8 (3 DUHDZ DVQRWZ LWKLQ WKH VSHFLH¶ JHRJ UDSKLF UDQJH

7KUHDWQHG (QGDQJHUHG DQG &DQGLGDW6SHFLHV

7KH8 6) : 6 FXUUHQW OWWWKUHH VSHFLHVXQGHUWH(6$ IRU(XUHNDDQG/ DQGHUFRXQWHV 8 6) : 6 7KH/ DKRQWQ FXWWKURDWWRXW*Oncorhynchus clarkia henshawi* LVDWKUHDWQHG VSHFLHV 7KH&ROXP EID VSRWWG IURJ *Rana luteiventris* DQG JUHDWUVDJH JURXVHDUHERWK FDQGLGDW VSHFLHV 7KH&ROXP EID VSRWWG IURJ LVDOR DWWWSURWFWG VSHFLHVDFFRUGLQJ WR 1 $ & 2 I WKHWHUHH VSHFLHV RQ WKHJUHDWUVDJH JURXVHRFFXUVLQ WKH+ & &8 (3 DUHD VHH: LOOOOLH5 HSRUW 7KHUHLVQR FUWWFDOKDEWDWWGHWJ QDWG Z LWKLQ WKH+ & &8 (3 DUHDIRUWKHWH WKUHH VPHFLHV 8 6) : 6

Greater Sage-grouse

,Q 8 6) : 6 IRXQG WKDWWKHJ UHDWUVDJH JURXVHZ DVDFDQGLGDW VSHFLHVIRUOLVWQJ XQGHU WKH(6$ EXWWKDWDFWRQZ DVSUHFXGHG E\ KLJKHUSUULW OLVWQJ V 8 6) : 6 ,Q1 HYDGD JUHDWUVDJH JURXVHDUHGLVWUEXWG WKURXJKRXWWKHQRUWKHQ WZR WKLGVRI WKH WWWW DQG DRQJ WKH WWWWERUGHUZ LWK&DOLIRUQLD $ OWRXJ K WKLV VSHFLHV¶ KLWRUF UDQJHKDVEHHQ UHGXFHG LWLV WWO

IRXQG LQ UHDWXHV) ODJ HSRSXODWRQVLQ(ONR QRUWKHQ+ XP ERGWQRUWKHQ: DVKRH (XUHND / DQGHU DQG: KLWH3 LQHFRXQWHV 1 ' 2 : ,Q(XUHND DQG/ DQGHUFRXQWHV WKHJ UHDWU VDJ HJ URXVHLVFXUHQW DFDQGLGDWH IRUDWWQJ XQGHUWKH(6$ 8 6) : 6

* UHDWUVDJ HJ URXVHLVD VDJ HEUXVK REQJ DWW\SHFLHV P HDQLQJ WKDWWVUHWWLFWG WR VDJ HEUXVK HFRV\ VWP VDQG FDQGRWXXLYLYHLQ DUHDVODFNLQJ WKLVKDEWWW6 DJ HEUXVK VKUXEVDUHXVHG IRU IRUDJ HDQG IRUQHWWQJ EURRG UHDUQJ DQG IDOZ LQWUFRYHU * UHDWUVDJ HJ URXVHFRQJ UHJ DWLDW OHNNLQJ J URXQGVHDFK VSULQJ 0 DUFK WR 0 D\ Z KHUHWKHP DOHVGLVSOD\ EUHGLQJ SOXP DJ HWR DWWDFWKHQVIRUP DWQJ 1 HWWQJ DQG HDL\ EURRG UHDUQJ RFFXUVIURP $ SULOWURXJ K-XQH 1 ' 2 : 1 HWWDUHZ LWLQ WR NLOPP HWLV WR P LOHV RI WKHOHN VLWWRQ DYHUDJ H &RQQHO) HWDO) XUWHUGHWWORQJ UHDWUVDJ HJ URXVHVHDWQDOKDEWWW UHTXLUHP HQWVDHJ LYHQ LQ WKH: LOGDIH5 HSRUW7 HWD7 HFK

%0 3 UHDP IQDU\ + DEWWW0 DS

7 KH%/ 0 DQG8 6) RUHVW6HUYLFH 8 6) 6 1 DWRQDO* UHDWU6 DJ H* URXVH3 0DQQLQJ 6WDWXW\ Z DVDIUP HZ RUNIRUIGHQW\ IQJ WZR FDWJ RUHVRI J UHDWUVDJ HJ URXVHKDEWWW 33+ DQG3* + $ 3 UHDP IQDU\ + DEWWW0 DS Z DVGHUYHG IURP WKH1 ' 2 : * UHDWU6 DJ HJ URXVH+ DEWWW &DWJ RU] DWRQGDW %/ 0 E 7 KH1 ' 2 : &DWJ RU\ (VWHQWDO,UUHSODFHDEOH+ DEWWW DQG &DWJ RU\ ,P SRUWDQW+ DEWWWZ HUHFRP EIQHG WR FUHDWWKH33+ DUHDV 7 KH1 ' 2 : &DWJ RU\ 0 RGHUDW,P SRUWDQFH+ DEWWWZ DVXVHG WR FUHDWWKH3* + DUHDV 7 KHRWKHU1 ' 2 : FDWJ RUHVDUH&DWJ RU\ / RZ 9 DOXH7 UDQWWRQDO5 DQJ H &DWJ RU\ 8 QXXWWEOH+ DEWWW DQG1 RQ + DEWWW7 KHJ UHDWUVDJ HJ URXVHKDEWWWDVP DSSHGE\ WKH%/ 0 3 UHDP IQDU\ + DEWWW 0 DS IVVKRZ QIQ) **IJXUH** 7 KH3 UHDP IQDU\ + DEWWW0 DS IGHQWIHG DFUHVRI SRWQWDO 33+ DQG DFUHVRI SRWQWDO3* + Z LWKIQ+ & &8 (3

7 KIV3 UHDP IQDU\ + DEWWW0 DS Z DVDSOOQIQJ VXSSRUWWRROWKDWIQFRUSRUDWG DYDLOEOHGDWWIQWR DWWDWZ IGHSUHDP IQDU\ VSDWDOYLHZ RI J UHDWUVDJ HJ URXVHKDEWWW7 KIVP DS Z DVQRWIQWQGHG WR EHXVHG WR GHOIQHDWJ UHDWUVDJ HJ URXVHKDEWWWDVWKHSURYHFWOHYHOVFDOH 7 R DSSO\ WKHVH UHXOWV WR VSHFLIF OR FDWRQV IWZ DVQHFHVDU\ WR FRQGXFW DIIHOGIQYHWW DWRQ E\ DTXDOIIHG EIROJ LWWRUWKHSXUSRVHRI IP SLFWDWHWP HQW1 ' 2 :

) IHG, QYHWW DWRQ RI * UHDWU6 DJ HJ URXVH+ DEWWW

$ VDUHXOWRI IIHOGIQYHWW DWRQ DQG IIHOGUHYIHZ %DUUIFN DQG LWVFRQXOWQW(6&2 GHYHORSHG WKH(6&2 + DEWWW0 DS RI * UHDWUVDJ HJ URXVH33+ DQG3* + IURP < HDUVRI 9 HJ HWWRQ 6XUYH\ ' DW7 (6&2 J UHDWUVDJ HJ URXVHKDEWWWP DS (UURU 1 R ERRNP DUN QDP HJ LYHQ

7 KH(6&2 + DEWWW0 DS RI * UHDWUVDJ HJ URXVHVKRZ V DFUHVRI 33+ IGHQWIHG IQ + & &8 (3 2 I WKLV WKHUHLVQR (VWHQWDO,UUHSODFHDEOH+ DEWWWDVGHIQHG E\ 1 ' 2 : DOWKH 33+ IVFODWLIIHG DV,P SRUWDQW+ DEWWWDVGHIQHG E\ 1 ' 2 : 7 KH(6&2 UHOHFWVWKDWWKHUHDUH DFUHVRI 3* + 7 KHUHDUH DFUHVRI OR Z YDOXHKDEWWWDQG DFUHVRI QRQ KDEWWW (6&2 E

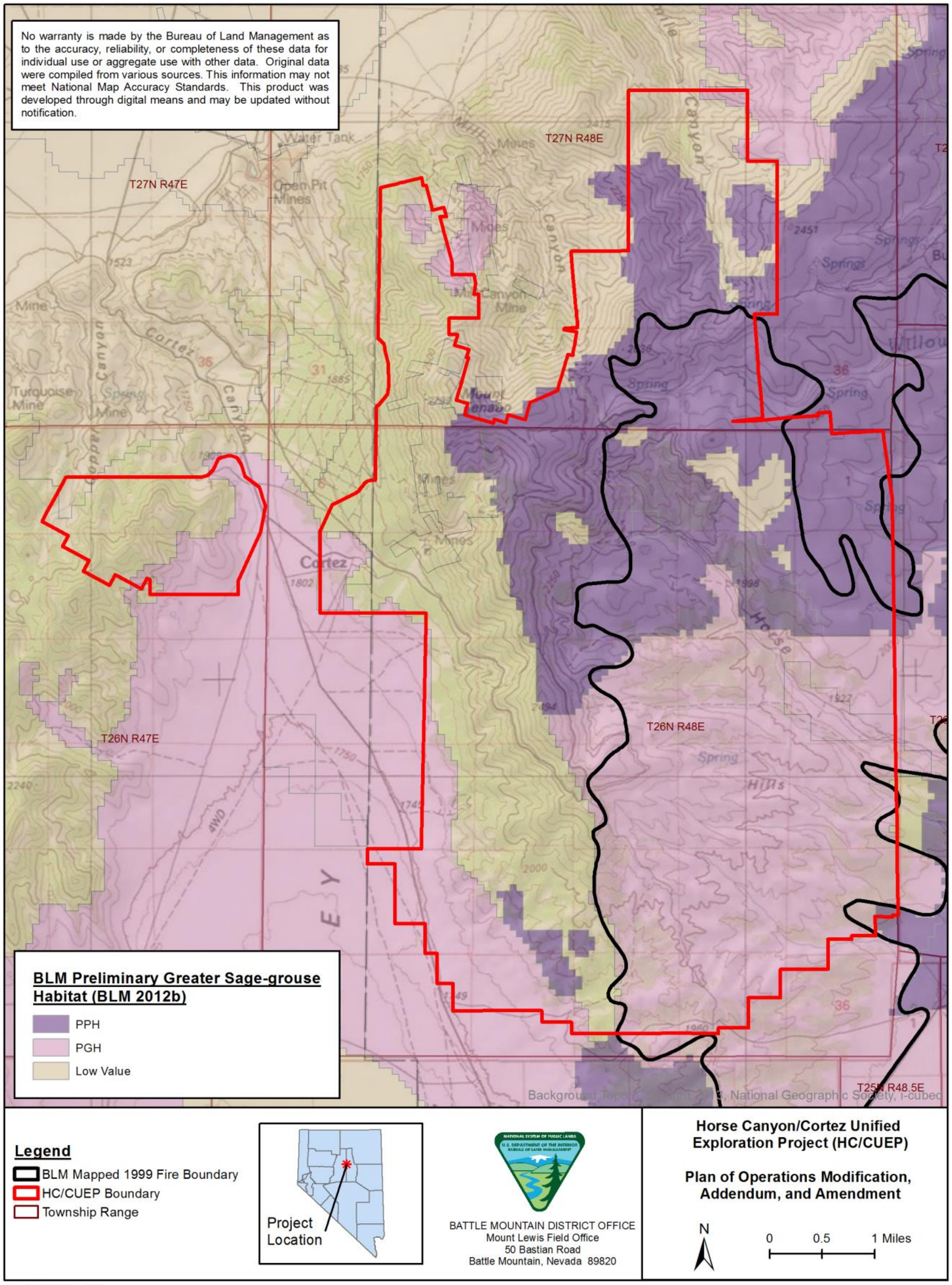
7 KH(6&2 J UHDWUVDJ HJ URXVHKDEWWWP DS (6&2 E P D\ EHXWD]HG DVDQRWHUWRRO IQ FRP EIQDWRQ Z LWK RWHUJ UHDWUVDJ HJ URXVHSRSXODWRQ GDWDFRQHFWRQ DQG KDEWWWDVWHWP HQW

PHWKRGV WR DVVLVW WKH %/0 IQGHQWLP IQLQJ SRWHQWDOOXXUHJUHDWLUVDJHJURXVHKDEWWWP SDFW WKDWP D\ UHXXOWURP SURSRVHG DFWWLWHVZ LWKLQ DQG VXUURXQGLQJ WKH+&&8(3 ERXQGDU\

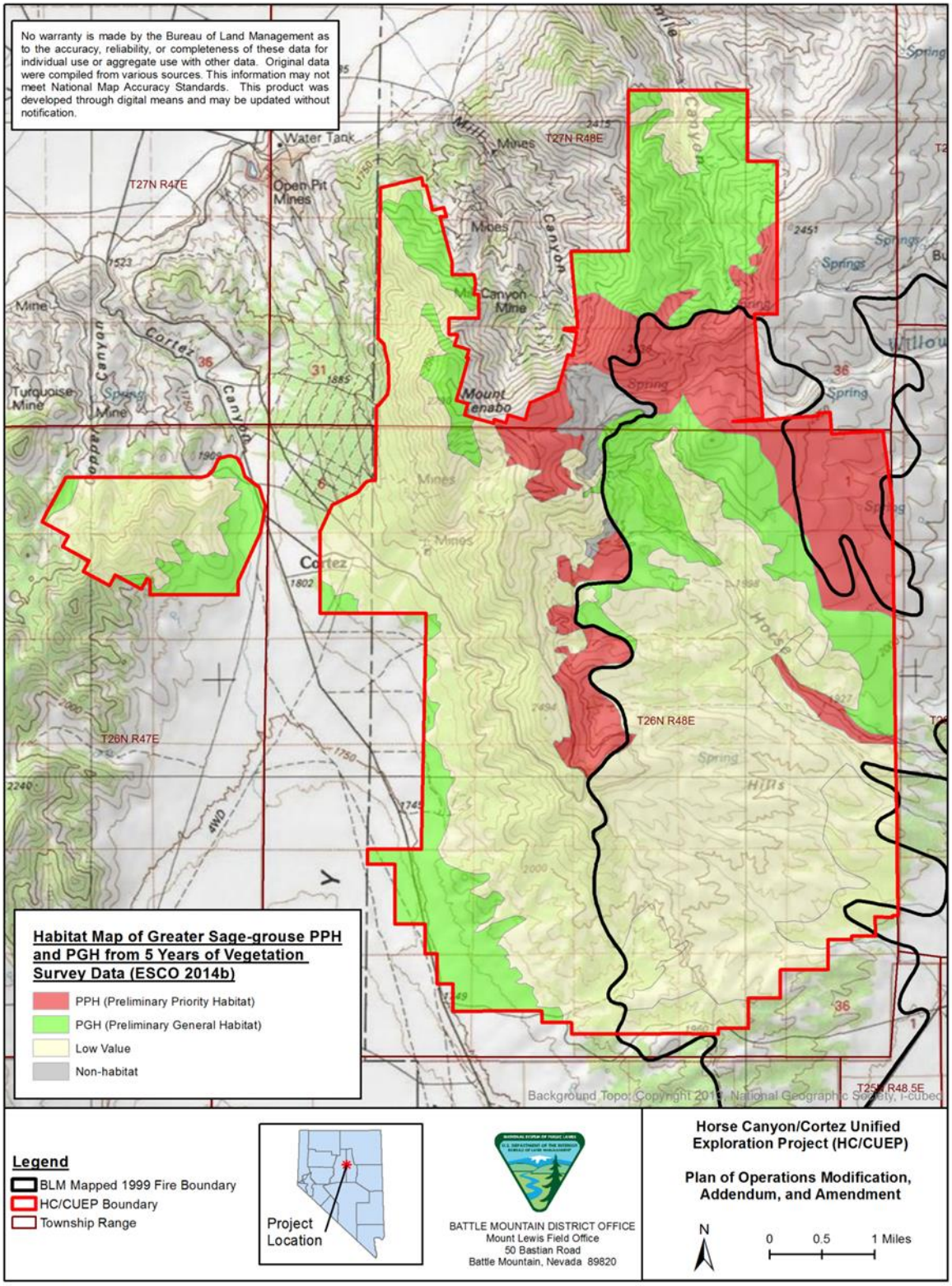
5HPLVHG ' ILHFWRQ IRU 3URSRVHG $FWWLWHVZ LWKLQ* UHDWU6DJHJURXVH+ DEWWW,0 19

2UJLQDOO WKH%/0 HYDOXDWG JUHDWUVDJHJURXVHKDEWWWFFRUGLQJ WR WKHLQWUP ,0 19
+RZ HYHU EDVHG RQ UHFHQW HYDGD%/0 JXLGDQFHSURYLGHG IQ,0 19
%/0 WKH%/0 KDVDGRSWG WKHIRORZ IQJ QHZ JUHDWUVDJHJURXVHKDEWWWFDWJRUHV
EDVHG RQ8 6*6 P DSSLQJ E\ &RDWVHWDO +LJK HTXLYDOHQWWR WKHSUHYIRXV33+
GHWJQDWRQ 0RGHUDW HTXLYDOHQWWR WKHSUHYIRXV3*+ GHWJQDWRQ /RZ DQG1RQ KDEWWW
%DVHG RQ WKHVHFDWJRUHV WKHUHDUHDSSUR[IP DWW DFUHVFDWWLHG DV+LJK
DSSUR[IP DWW DFUHVFDWWLHG DV0RGHUDW DSSUR[IP DWW DFUHVFDWWLHG DV
/RZ DQG DSSUR[IP DWW DFUHVFDWWLHG DV1RQ+DEWWWQ WKH+&&8(3 DUHD 7KH
UHYLVHG P DSSLQJ VKRZ QIQ**) LJXUH** IQFRUSRUDWWV XSGDWG WDOP HWW GDW DQGFDSH
KDEWWWP DSSLQJ IQFXGLQJ YHJHWDWRQ P DSSLQJ WRSRJUDSK\ DQG DQG IHDXUHV DQG DN GDW

)LJXUH %/0 3UHOLPLQDU\ +DELWDW0DS*UHDWHU6DJHJURXVH33+ DQG3*+

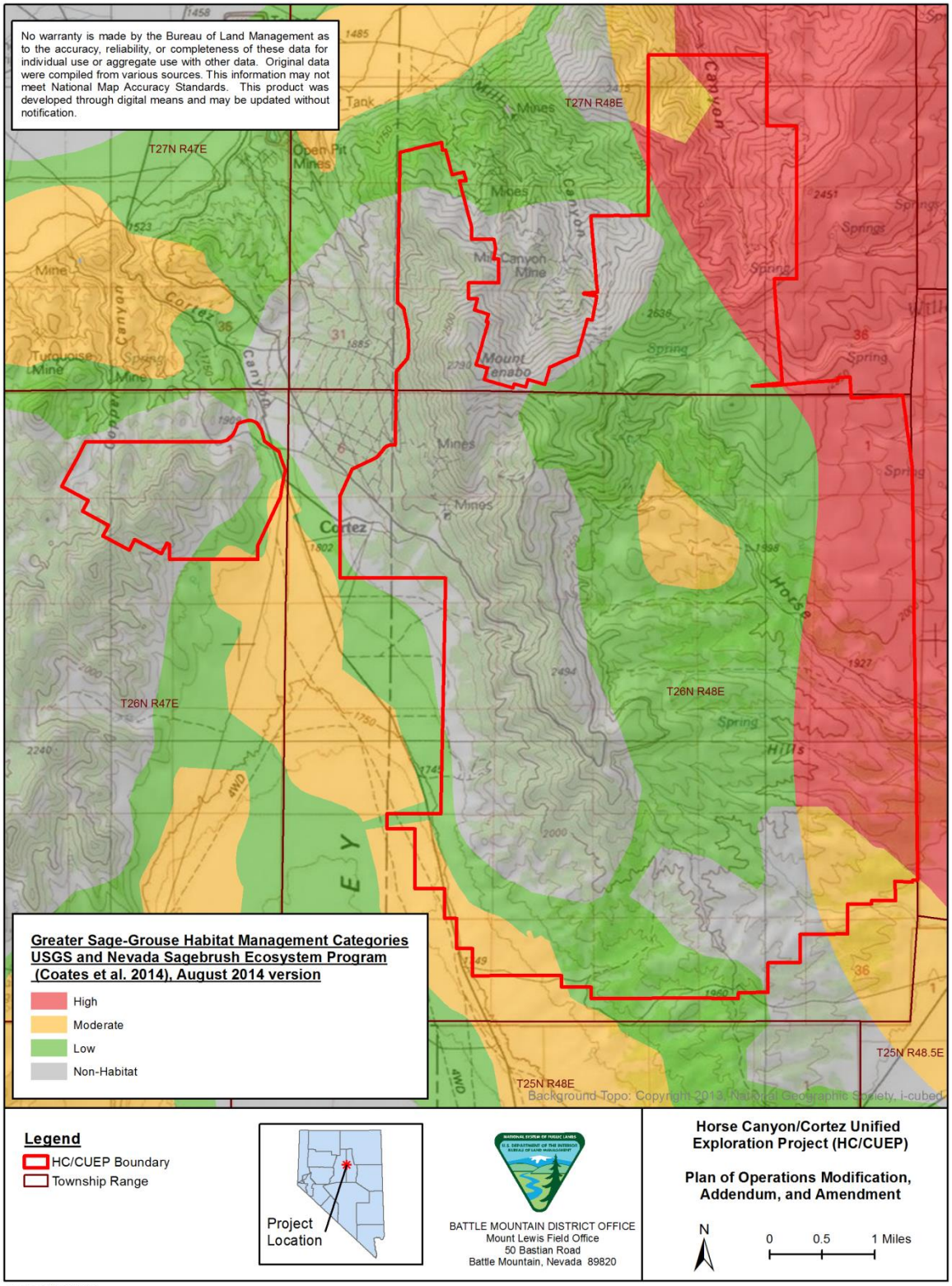


) LJXUH (6&2 + DEEDWDW0 DS RI * UHDWHU6DJH JURXVH33 + DQG3 * + IURP < HDUVRI 9 HJHWDWRQ' DWD



Date: 2/3/2015

) LJXUH * UHDWHU 6DJH JURXVH0 DQDJHP HQW&DWHJRULHV8 6* 6 DQG 1 HYDGD 6DJHEUXVK (FRV VWHP 3 URJUDP



Date: 2/25/2015

*** UHDWLQ6DJHJURXVH/ HNV**

$ FFRUGLQJ WR 1 ' 2 : GDW Z LWKLQ IRXUP LQHVRI WKH+ & &8 (3 DUHDWKHUHDUHILYHNQRZ QQHNV LQFOXGLQJ RQHLQFXWYHQN + RUVH&UHN WZR DFWYHQNV + RUVH&UHN DQG 1 HZ %URFN &DQ\RQ DQG WZR QHNVZ KHUHWKHVWXXVZ DVXQNQRZ Q &RUW] * UDW9 DQH DQG) \ H&DQ\RQ 1 ' 2 : $ FWYH VWXXVLVGHLQHG DVWZR P DQHJ UHDWLUVJ HJ URXVHVLJ KWG DVQHDWWZR WP HVLQWKHQDWWLYH\ HDUV %/ 0 F

* UHDWLUVJ HJ URXVHQN DFWYLW VXLYH\ VZ HUHFRQGXFWG LQ WKH\SUQJ RI LQ RUGHUWX GRFXP HQWWKHFXUHQWWXXVRI NQRZ QQHNVZ LWKLQ IRXUP LQHVRI WKH+ & &8 (3 DUHD $ 5&$' ,6 D ' HWLORQ WKHVXLYH\ P HWKRGRORJ\ LVLQFXGHG LQ WKH: LOOLH5 HSRUW7 HWD7 HFK 7 KHIIHG VXLYH\ VGHWLP LQHG WKDW+ RUVH&UHN DQG 1 HZ %URFN&DQ\RQ QHNVZ HUHDFWYHLQ Z LWK SHDNP DQHFRXQWVRI DQG UHVSHFWYHO $ 5&$' ,6 D &RUW] * UDW 9 DQH) \ H&DQ\RQ DQG + RUVH&UHN QHNVZ HUHLQDFWYHGXULQ WKH VXLYH\V $ QHZ QHN Z DVDOR GRFXP HQWG QHDUWKH&RUW] * UDW9 DQH QHN ,WLVORFDWG Z LWKLQ IRXUP LQHVRI WKH + & &8 (3 ERXQGDU\ DQG LVUHHUHG WR KHUHQ DVWKH³1 HZ &RUW] * UDW9 DQH / HN $ 5&$' ,6 D $ P DJIP XP RI VL[P DQHJ UHDWLUVJ HJ URXVHZ HUHGRFXP HQWG DWWKLVQHN ' HWLOHG VXLYH\ UHXXOWVDUHSURYLGHG LQ WKH: LOOLH5 HSRUW

* UHDWLUVJ HJ URXVHQNVQRFDWG Z LWKLQ IRXUP LQHVRI WKH+ & &8 (3 DUHDDUHVKRZ QRQ) LJXUH **)** RUDFWYHQNV GDWLDWWDFWYHLVEDVHG RQ WKH$ 5&$' ,6 D VXLYH\ ) RULQDFWYH QHNV GDWLDWWDFWYHLVIURP WKH1 ' 2 : * ,6 GDWEDVH 7 KHVSHFLIIF QHN QRFDWRQ SRLQWVVQRW VKRZ QRQ WKHP DS GXHWR WKHVHQWWYHQDXUHRI WKHGDW

,QRUGHUWR DWHWVWKHSRWQWDOIRUQRLVH UHDWG IP SDFWWR J UHDWLUVJ HJ URXVHDWWQGDQFHDWWKH QHNV DEDVHDLQHQRLVHP RQLWRULQJ WXG\ Z DVFRP SOHWG $ 5&$' ,6 D 7KHREMHFWYHRI WKH QRLVHWXG\ Z DVWR FKDUDFWUL]HDQ TXDQW\ WKHFXUHQWQRLVHHQYLURQP HQWDURXQG WZR DFWYH QHNVQRFDWG QHDUWKH+ & &8 (3 DUHD + RUVH&UHN DQG 1 HZ %URFN&DQ\RQ IURP DP WR DP ' HWLORQ WKHP RQLWRULQJ P HWKRGRORJ\ LVLQFXGHG LQ WKH: LOOLH5 HSRUW7 HWD7 HFK

1 RLVHP RQLWRULQJ UHVXOW UHSRUWG EHORZ LQFXGH GDW FRQHFWG IURP DP WR DP DOO P RQLWRULQJ GD\V IURP 0 DUFK WKURXJK 0 D\ FRP ELQHG

7 KH QRLVHP RQLWRULQJ GDW DWWKH + RUVH&UHN / HN $ 5&$' ,6 D $ 5&$' ,6 VLWW VKRZ VWKHIRQRZ IQJ

- 0 IQ/ G%$
- 0 DJ / G%$
- / IQHDU0 HDQ/ G%$

7 KHEDVHOLQH QRLVHWKUHVKRQG DW+ RUVH&UHN / HNZ DVFDOFXODWG DV $ 5&$' ,6

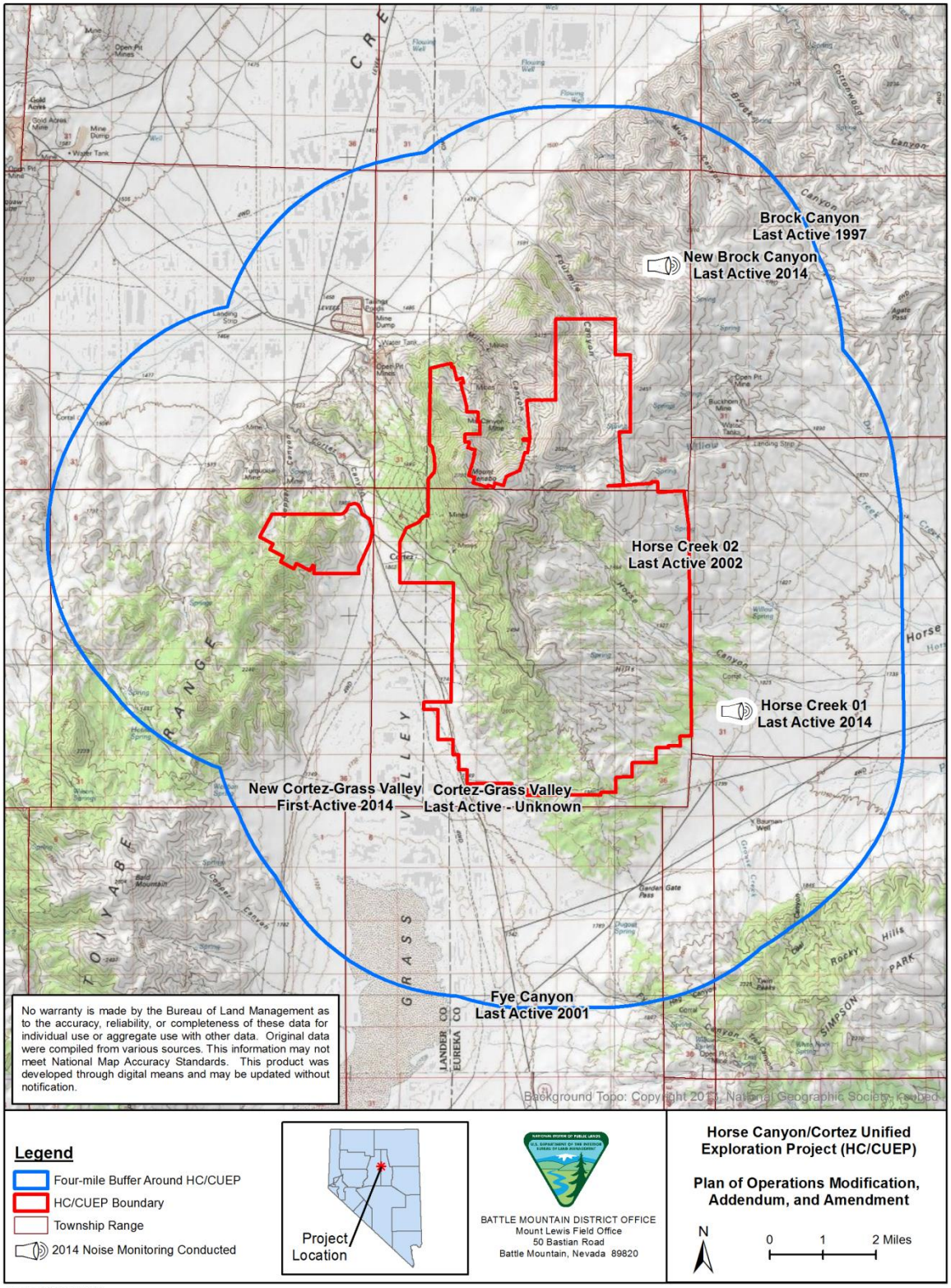
7 KH QRLVHP RQLWRULQJ GDW DWWKH 1 HZ %URFN &DQ\RQ / HN $ 5&$' ,6 D $ 5&$' ,6 VLWW VKRZ VWKHIRQRZ IQJ

- 0 IQ/ G%$
- 0 DJ / G%$

- / LQHDU0 HDQ/ G%$

7 KH EDVHOLQH QRLVH VKUHVKRO G DWL HZ %URFN &DQ RQ / HN Z DV FDOFXODWG DV $ 5 &$ ' ,6

) LJXUH * UHDWU6DJHJURXVH/ HNVZ LWKLQ) RXU0 LOH RI + & &8 (3



Date: 11/12/2014

% 0 6HQMLWYHDQG6WDWXVOXVG6SHFLHV

6SHFLHVDUHOXVG DV%/ 0 VHQMLWYHLI VKHUHLVHYLGHQFHRI DGRZ QZ DLG WHQG LQ SRSXOXWRQ QXP EHUV VXFK WKDWYLDEOXW RUDGLWXQFVSRSXOXWRQ VHJ P HQWRI WKHVSHFLHVLVDWXLXN DFURWDOORU DVLJ QLIFDQVSRUWRQ RI LWVUDQJ H $ VSHFLHVP D\ DOVR EHOXVG LI LWKDVDUHWXFWG J HRJ UDSKIF UDQJ H RUUHTXLUHV VSHFLDO] HG RUXQLTXH KDELWXWWKDWRFFXUVRQ%/ 0 DGP LQLWXLHG ODQG DQG WKHUHLVHYLGHQFH WKDWXXFK DUHDVDUHWKUHDWHQHG VXFK WKDWWKHVSHFLHV¶ YLDEOXW P D\ EHDWXN $ OO1 HYDGDWXW OXVG VSHFLHVDUHDOR GHMJ QDWG DV%/ 0 VHQMLWYHVSHFLHV

7DEOH OXW%/ 0 VHQMLWYHDQG WXVG OXVG VSHFLHVWKDWRFFXURUP D\ RFFXULQ WKH+ & &8 (3 DUHDDORQJ Z LWK WKHLUVHDRQDOXVH DQG DWRFLDWG: $ 3 NH KDELWXW WKDWRFFXUZ LWKLQ WKH + & &8 (3 DUHD 7KHUHDUH %/ 0 VHQMLWYHVSHFLHVWKDWZ HUHLGHQWLIHG DVP D\ RFFXUZ LWKLQ WKH+ & &8 (3 DUHD LQFOXGLQJ RQHDP SKIEIDQ EILGV DQG P DP P DOV 6XUYH\ VIRUS\ J P \ UDEEIWEXURZ IQJ RZ O *Athene cunicularia a hypugaea* DQG EDWSHFLHVKDYHEHQ FRP SOHWG 1 DWXUDOKLWRU\ IQIRUP DWRQ IRUWKHUP DLQIQJ %/ 0 VHQMLWYHDQG WXVG OXVG VSHFLHVLV GHMFUEHG IQ WKH: IOOOIH5 HSRUW7 HXD7 HFK

7DEOH % 0 6HQMLWYHDQG6WDWXVOXVG6SHFLHV

6SHFLHV	**6WDWXV**	**6HDVRQDO8 VH**	**: $3 . H + DEITDW IQ+ & &8 (3 $ UHD**	**5DWRQDOHIRU &RQVLGHUDWRQ**
$ P SKIEIDQV				
1 RUWKHUQ/ HRSDUG) URJ *Rana pipiens*	6 63	< HDUURXQG	,QWUP RXQWDQ5 LYHUV DQG6WHP V6SUQJ V DQG6SUQJ EURRNV : $37	+ LVRUHFDO) RFFXUHG WKURXJ KRXW P RWRI 1 HYDGDEXWQRZ RFFXUV IQSDWK\ LVRDWG DUHDV 5 RJ HUV DQG3HDFRFN 3RWQWDO KDEITWP D\ EHSUHVHQWQ VSUQJ V DORQJ GUDLQDJ HV DQG DWRFLDWG XSODQG DUHDVIQ + & &8 (3
%LUGV				
%DOG(DJOH *Haliaeetus leucocephalus*	6 6(%&&	: IQWU	6DJHEUXVK ,QWUP RXQWDQ&RQG ' HVHUW6KUXE ,QWUP RXQWDQ5 LYHUV DQG6WHP V: $37	: IQWUUHVGHQWQ QRUWKHQ 1 HYDGD) OR\ G HWDO &RXOG IRUDJ HIQ WKH+ & &8 (3 DUHD
%DDFN5 RV\ IICFK *Leucosticte atrata*	6 %&&	0 LJ UDWRQ DQG RU: IQWU	/ RZ HU0 RQWQH : RRGDDQGVDQG &KDSDUUDO* UDWDDQGV DQG0 HDGRZ V &DUIV DQG&DQ RQV &DYHV DQG0 IQHV 6DJHEUXVK 1 HHO : $37	&RP P XQDOQJ KWRRWVIQ Z IQWUFRQWWP DIQ) RI DEDQGRQHG P IQHVKDWDQG DGLW DQG QDXUDOFDYHV * %%2 6XWWEOHKDEITWW[IWW Z IWQ WKH+ & &8 (3 DUHD
%UHZ HL¶V6SDUURZ *Spizella breweri*	6 66 %&&	6SUQJ 6XP P HU	6DJHEUXVK : $37	2 QHRI WKHP RWWFRP P RQEITGV IQ1 HYDGD¶V VKUXEDDQGV) OR\ G HWDO 6XWWEOHKDEITWW H[IWW Z IWQ WKH+ & &8 (3 DUHD

7DEOH %0 6HQVLWLYH&RQG6WDWXVRIWG6SHFLHV

6SHFLHV	6WDWXV	6HDVRQDO8VH	:$3.H+DELWDW LQ+&&8(3 $UHD	5DWRQDOHIRU &RQVLGHUDWRQ
)HUUXJLQRXV+DZN *Buteo regalis*	6 %&&&	6SULQJ 6XPPHU)DOO	6DJHEUXVK/RZHU 0RQWDQH:RRGODQGV DQG&KDSDUUDO *UDVVODQGVDQG 0HDGRZV&OLIIVDQG &DQ\RQV ,QWHUPRXQWDLQ&RQG ' HVHUW6KUXE %DUUHQ /DQGV LH PLGHKLJK ZDOOV :$37 1HHO	0RWWFRP PRQ)IRXQGZKHUH VDJHEUXVKLVLQWHUSHUVHGZLWK RFFDVLRQDOWLQLSHUV)OR\GHWDO 6XUYHOHKDEWWWH[LVW ZLWLQRUQHDUWKH+&&8(3 DUHD
*RGHQ(DJOH *Aquila chrysaetos*	6 %&&&	<HDUURXQG	&OLIIVDQG&DQ\RQV %DUUHQ/DQGV LH PLGHKLJKZDOOV :$37	:LGHVSUHDGLQWKHUXJHG FDQ\RQV VDJHEUXVKIRRWKLOOV DQGKLJKPRXQWDLQVRI1HYDGD)OR\GHWDO .QRZQWR QHVWLQWKH+&&8(3DUHD *%(
*UHDWHU6DJH*URXVH *Centrocercus urophasianus*	&6 %&&&	<HDUURXQG	6DJHEUXVK ,QWHUPRXQWDLQ5LYHUV DQG6WHPV :$37 1HHO	7KHVDJHEUXVKKDEWWDWRQ WKH VRXWKHQIRRWKLOOVRI WKH&RUW[UDQJHLQQRUWKHQ*UDV9DOOH SURYLGHVKDEWWWRUUHDWU VDJHJURXVH %/0 D .QRZQWRRFFXUZLWLQWKH +&&8(3DUHD1'2:
/RJJHUKHDG6KUINH *Lanius ludovicianus*	6 66 %&&&	<HDUURXQG	6DJHEUXVK/RZHU 0RQWDQH:RRGODQGV DQG&KDSDUUDO :$37	:LGHVSUHDGLQWKHVXUEEDQGVRI 1HYDGD)OR\GHWDO 6XUYHOHKDEWWWH[LVWZLWLQWKH +&&8(3DUHD
1RUWKHUQJRVKDZN *Accipiter gentilis*	6	<HDUURXQG	/RZHU0RQWDQH :RRGODQGVDQG &KDSDUUDO *%%2	1HWWQJ XQDNHD)GXHWRODFNRI PDWXUHIRUHWWEXWP D\ IRUDJHLQ WKH+&&8(3DUHD
3LQ\RQ-D\ *Gymnorhinus cyanocephalus*	6 %&&&	<HDUURXQG	/RZHU0RQWDQH :RRGODQGVDQG &KDSDUUDO :$37	:LGHUDQJLQJ1HYDGDDQG FRORVH)WHGWRSLQ\RQSLQHWHHV 1HHO 6XUYHOHKDEWWW H[LVWZLWLQWKH+&&8(3 DUHD
6DJH7KUDVKHU *Oreoscoptes montanus*	6 66 %&&&	6SULQJ 6XPPHU	6DJHEUXVK :$37	)DYRUVODUJHH[SDQVHVRI XQGLVWXUEHG WWDVDJHEUXVK)OR\GHWDO 6XUYHOHKDEWWWH[LVWZLWLQWKH +&&8(3DUHD
6ZDLQVRQ¶V+DZN *Buteo swainsoni*	6	6SULQJ 6XPPHU(DUO))DOO	6DJHEUXVK 6DJHEUXVK *UDVVODQGVDQG 0HDGRZV/RZHU 0RQWDQH:RRGODQGV DQG&KDSDUUDO 1HHO	.QRZQWRRFFXUQYDOOH\V VXUURXQGLQJ WKH+&&8(3DUHD VXUWHOHIRUDJLQ KDEWWW H[LVW ZLWLQ+&&8(3DUHD)OR\GHW DO

7 DEOH % 0 6HQVLWLYH DQG 6WDWXWRULOH 6SHFLHV

6SHFLHV	6WDWXV	6HDVRQDO 8VH	: $3 . H + DELWDW LQ + & &8 (3 $UHD	5DWLRQDOH IRU &RQVLGHUDWLRQ
: HVWHUQ %XUURZLQJ 2 Z O *Athene cunicularia hypugaea*	6	6SULQJ 6XP P HU	6DJHEUXVK * UDVVODQGVDQG 0 HDGRZ V %DUUHQ / DQGV ,QWHUP RXQWDLQ 5 LYHUVDQG 6WHDP V : $37 1 HHO	) RXQGLQ DZ LGHYDUHW RI DUG DQG VHP LDUG HQYLURQP HQW Z LWKZ HOGDUDLQHG OHYHOWR J HQHW VORSLQJ DUHDV FKDUDFWHULJHG E\ VSDUVH YHJHWDWRQ DQG EDUHJ URXQG . OXWHWDO 6XUWEOH KDELWDWH[LWWZ LWKLQ WKH + & &8 (3 DUHD 6XUYH\ VFRQGXFWHG LQ EXUURZ LQJ RZ OVQRVGHWHFWHG
0 DP P DOV				
%LJ %URZ Q%DW *Eptesicus fuscus*	6	< HDUURXQG	/ RZ HU0 RQWDQH : RRGODQGVDQG &KDSDUUDO 6DJHEUXVK DQG %DUUHQ/ DQGV 1 %&*	,Q1 HYDGD RFFXUVI URP WK P HWDLV 1 %&* 6XUWEOH KDELWDWH[LWWZ LWKLQ WKH + & &8 (3 DUHD ,GHQWLIHG LQ VXUYH\
%UDJLOLDQ) UHH WDLOHG %DW *Tadarida brasiliensis*	6 63	6XP P HU	/ RZ HU0 RQWDQH : RRGODQGVDQG &KDSDUUDO 6DJHEUXVK * UDVVODQG DQG 0 HDGRZ V 1 %&*	,Q1 HYDGD RFFXUVI URP WK P HWDLV 1 %&* 6XUWEOH KDELWDWH[LWWZ LWKLQ WKH + & &8 (3 DUHD 1 RWHGHQWLIHG LQ VXUYH\
&DOLIRUQLD0 \RWW *Myotis californicus*	6	< HDUURXQG	/ RZ HU0 RQWDQH : RRGODQGVDQG &KDSDUUDO 6DJHEUXVK * UDVVODQG DQG 0 HDGRZ V IRUDJLQJ &DYHVDQG 0 LQHV URRVWQJ 1 %&*	,Q1 HYDGD RFFXUVI URP WK P HWDLV 1 %&* 6XUWEOH KDELWDWH[LWWZ LWKLQ WKH + & &8 (3 DUHD ,GHQWLIHG LQ VXUYH\
' DUN. DQ DURR0 RXVH *Microdipodops megacephalus*	6 63	< HDUURXQG	6DJHEUXVK * UDVVODQGVDQG 0 HDGRZ V : $37	6XUWEOH KDELWDWH[LWWZ LWKLQ WKH + & &8 (3 DUHD
) LQJHG0 \RWW *Myotis thysanodes*	6 63	< HDUURXQG	/ RZ HU0 RQWDQH : RRGODQGVDQG &KDSDUUDO IRUDJLQJ &DYHVDQG 0 LQHV URRVWQJ : $37	,Q1 HYDGD RFFXUVI URP WK P HWDLV 1 %&* 6XUWEOH KDELWDWH[LWWZ LWKLQ WKH + & &8 (3 DUHD ,GHQWLIHG LQ VXUYH\
+ RDU %DW *Lasiurus cinereus*	6	< HDUURXQG	/ RZ HU0 RQWDQH : RRGODQGVDQG &KDSDUUDO IRUDJLQJ &DYHVDQG 0 LQHV URRVWQJ : $37	7 UHH DWRFFDWHG VSHFLHV IRXQG SUP DUL0 LQ IRUHVWHG XSODQGVLQ 1 HYDGD KDV DOR EHHQ UHFRUGHG LQ MXQLSHUVWDQGV 1 %&* -XQLSHUZ RRGODQGVRFFXULQ WKH + & &8 (3 DUHD 1 RWHGHQWLIHG LQ VXUYH\
/ RQJ HDUHG0 \RWW	6	< HDUURXQG	/ RZ HU0 RQWDQH	,Q1 HYDGD RFFXUVI URP WK

7 DEOH % 0 6HQMLWYHDQG6 WDWXV0DWXG6SHFLHV

6SHFLHV	6WDWXV	6HDVRQDO8 VH	: $3 . H + DELWDW LQ+ & &8 (3 $ UHD	5 DWRQDOHIRU &RQVLGHUDWRQ
Myotis evotis			: RRGODQGVDQG &KDSDUUDO6DJHEUXVK IRUDJLQJ &DYHVDQG 0 LQHV URRVWQJ : $37	P HWULV 1 %& * 6XLWDEOHKDELWDWH LVWZ LWKLQ WKH + & &8 (3 DUHD ,GHQWLIHG LQ VXUYH
/ RQJ OHJJHG0 \RWLV *Myotis volans*	6	<HDUURXQG	/ RZ HU0 RQWQH : RRGODQGVDQG &KDSDUUDO6DJHEUXVK 1 %& *	,Q1 HYDGDRFFXUVIURP WR P HWULV 1 %& * 6XLWDEOHKDELWDWH LVWZ LWKLQ WKH + & &8 (3 DUHD ,GHQWLIHG LQ VXUYH
3DOOG%DW *Antrozous pallidus*	6 63	<HDUURXQG	/ RZ HU0 RQWQH : RRGODQGVDQG &KDSDUUDO6DJHEUXVK 1 %& *	,Q1 HYDGDRFFXUVIURP WR P HWULV 1 %& * . QRZ QWR RFFXUZ LWKLQ IRXU P LOHVRI + & &8 (3 1 ' 2 : + DELWDWH LVWZ LWKLQ WKH + & &8 (3 DUHD 1 RWGHQWLIHG LQ VXUYH
3IND *Ochotona princeps)*	6 63	<HDUURXQG	&OLIVDQG&DQ RQ LH URFNRXWURSV * UDVODQGV	,Q1 HYDGDDQG&DDIRUQLD RFFXUVIURP WR IHHW 0 ILOODUDQG: HWWDOO 0 D RFFXUIQ WDXVDUHDVDWKJ K HDYDWRQVIQ+ & &8 (3 DUHD HVSHFLDOO Z KHUHWDXVDQG JUDVODQGVDUHDGWFHQW
3\JP\ 5DEEIW *Brachylagus idahoensis*	6	<HDUURXQG	6DJHEUXVK * UHHQ DQG) OQGHUV : $37	2 FFXSIHG KDEWDWDQG DFWXH EXURZ VSUHHGWQ WKH VRXWZ HWWQ SRUWRQ RI + & &8 (3
6SRWWG%DW *Euderma maculatum*	6 67	<HDUURXQG	/ RZ HU0 RQWQH : RRGODQGVDQG &KDSDUUDO%DUUHQ / DQGV IRUDJLQJ &OLIVDQG&DQ RQ URRVWQJ : $37	1 RWWQRZ QWR RFFXUIQ FHQWDO 1 HYDGD KRZ HYHU Z IGH) GLVWUEXWG WKURXJ KRXWWH UHWRI WKH WDWW DQG VXLWDEOHKDEWDW H[LVWZ LWKLQ+ & &8 (3 DUHD 2 FFXUVIURP WR P HWULV 1 %& * 1 RWGHQWLIHG LQ VXUYH
7RZQVHQG¶V%LJ HDUHG %DW *Corynorhinus townsendii*	6 66	<HDUURXQG	/ RZ HU0 RQWQH : RRGODQGVDQG &KDSDUUDO IRUDJLQJ &DYHVDQG 0 LQHV URRVWQJ : $37	,Q1 HYDGDRFFXUVEHWZ HHQ WR P HWULV 1 %& * 7KLVEDWKDVEHQ REVHUYHG ZLWKLQ IRXUP LOHVRI WKH + & &8 (3 DUHD 1 ' 2 : ,GHQWLIHG LQ VXUYH
: HVWHUQ3ISLVWUHOOH *Pipistrellus Hesperus*	6	<HDUURXQG	6DJHEUXVK / RZ HU 0 RQWQH: RRGODQGVDQG&KDSDUUDO 1 %& *	,Q1 HYDGDRFFXUVIURP WR P HWULV 1 %& * 6XLWDEOHKDEWDW H[LVWZ LWKLQ WKH + & &8 (3 DUHD
: HVWHUQ6P DOOIRRWHG 0 \RWLV *Myotis ciliolabrum*	6	<HDUURXQG	/ RZ HU0 RQWQH : RRGODQGVDQG &KDSDUUDO IRUDJLQJ	,QFHQWDO1 HYDGDFRP P RQ) IRXQG LQ YDOOH ERWWRP VIURP WR P HWULVLQD

7 DEOH % 0 6HQVLWLYH DQG 6WDWXV 6SHFLHV

6SHFLHV	6WDWXV	6HDVRQDO 8VH	: $3 . H + DEITWW IQ+&&8(3 $UHD	5DWRQDOH IRU &RQVLGHUDWRQ
			&DYHVDQG0 IQHV URRVWQJ : $37	YDUHW RI KDEWWV 1%: * 6XWWEOHKDEWWV SRWWEOHIQ QRZ HUHDYDWRQ SRUWRQVRI WKH+&&8(3 DUHD ,GHQWIHGIQ VXUYH

& FDQGLGDWH VSHFLHVXQGHU(6$ 86): 6 6 %/0 VHQVLWLYH VSHFLHV %/0 F 6(WDWHQGDQJHUHG VSHFLHV 67 WDWHWKUHDWHG 63 WDWHSURWHFWG 66 WDWHVHQVLWLYH VSHFLHV 1$& %&& 86): 6 %LGRI &RQVHUYDWRQ &RQFHUQ 86): 6

Pygmy Rabbit

7KHS\JP\ UDEEEIWVVD VDJHEUXVK REQJ DWVSHFLHV ,WVVHQGHP IF WR WKH* UHDV%DVLQ Z KHUHIWV UDQJHIVFHQWUHG RQ1HYDGD ,WVGLWXEXWRQ Z LWKLQ WKLVUDQJHIVSDWK\ . HQDWK DQG0 F* HH ,WVIRXQG RQ ELJ VDJHEUXVK SOD]QVDQG DOXYDOIDQV SDUWFXOD]O IQ FXP SVRI VDJHEUXVK WKDWUHWWDOD QG GHQVHUHDWXVHWR WKH VXUURXQGLQJ VDJHEUXVK * UHQ DQG) OLQGHUV / DUXFHD DQG %UXVWDLG 3\JP\ UDEEEIWUHTXLUHGHHS IULEOHVRIQV VXFK DVORDP IRUH[FDYDWQJ EXURZ V ,WZ IQWUGHWVDP RWW[FXVLYH) VDJHEUXVK ,Q VXP P HU DERXWKDD RI IWVGHWVV FRP SRVHG RI VDJHEUXVK DQG DOR JUDVVHV * UHQ DQG) OLQGHUV ,WVVORZ P RYLQJ DQG VXVFHSWEOHWR SUHGDWRQ DQG WKHUHRUHGHSHQGHQWRQ FRYHUIRUSURWFWRQ 1 1 + 3 3\JP\ UDEEEIWSRSXODWRQVDUHDWLVN IURP ORVDQG IUDJ P HQWWRQ RI VDJHEUXVK KDEWWWSDUWFXOD]O VIQFHWKH DUHQRWEOHWR FURVVDJ HEDUUHUV HJ SOD\DV P RXQWWQV Z KHQ GLVSHUVLQJ . HQDWK DQG0 F* HH

$ S\JP\ UDEEEIWXUYH Z DVFRQGXFWG IQ IQ KDEWWWGHQWIHG DVVXWWEOHIQ+&&8(3 $5&$' ,6 E 3\JP\ UDEEEIWQGLYGXDOVDQG DFWYHEXUZ V\WWP VZ HUHREVHYHG IQ IIYH ORFDWRQVIQ WKH VXUYH DUHD IQ RUQHDUWKHYDOOH IORRUIQ WKH VRXWZ HWSRUWRQ RI WKH+&&8(3 DUHD 2FFXSIHG VWWVZ HUHORFDWG IQ RUQHDUGHQVH WWQGVRI WWOVKUXEVZ KHUHVRIOVZ HUHGHHS DQG IUDEOHDQG VORSHVZ HUHJ HQWH 6RP HEXURZ V\WWP VFRQWQHGP XOWSOHEXURZ HQWDQFHV RUP RUHEXURZ VIQD IRRWDDGXV $UHDVZ KHUHQR S\JP\ UDEEEIWZ HUHGHWFWG Z HUH FKDUDFWUL]HG E\ VKRUWQG OWZ GHQWLW VKUXEV

Migratory Birds

7KLVVHFWRQ GLVFXVVHVP IJ UDWU EIUGVWKDWRFFXURUDUHH[SHFWG WR RFFXUIQ WKH+&&8(3 DUHD Z LWK DQ HP SKDVLVRQ%/0 SUURUW EIUGV ,QRUGHUWR IRFXVP DQDJ HP HQWHIRUW %/0 KDV GHIQHG SUURUW EIUGV %/0 F DVIQFOXGIQJ 86): 6 %LGVRI &RQVHUYDWRQ &RQFHUQ %&&& 86): 6 DQG86): 6 * DP H%LGV%HOWZ ' HVLUHG &RQGLWRQ * %%% & 86): 6 6RP H%/0 SUURUW EIUGVDUHDOR OWWG DV%/0 VHQVLWLYH VSHFLHV

2YHU EIUGVSHFLHVP D\ EHIRXQG IQKDEWWQJ 1HYDGDIRUDOORUSRUWRQVRI WKH\HDU 1 1 + 3) RUDQRYHUYHZ OWWRI EIUGVREVHUYHG RUH[SHFWG WR RFFXUIQ+&&8(3 VHHWKH : ICOOOLH5HSRUW7HWD7HFK 7KHP DRUWW RI EIUGVWKDWRFFXUIQ WKH+&&8(3 DUHDDUH

SURWHFWHG XQGHU WKH 0 LJUDWRU\ %LUG 7UHDW\ $ FW 0 %7 $ ZKLFK SURKLELWV WDNH RI DP LJUDWRU\ ELUG RU SDUWV QHVWV RU HJJV RI VXFK ELUGV 3URWHFWHG ELUGV DUH WKRVH WKDW DQQXDOO\ P LJUDWH IURP VXP P HU EUHHGLQJ JURXQGV WR DGLIIHUHQW ZLQWHU UDQJH 6SHFLHV WKDW DUH W\SLFDOO\ HQFRXQWHUHG LQ WKH + & &8 (3 DUHD LQFOXGH JHQHUDOLVW VSHFLHV DQG VSHFLHV DVVRFLDWHG ZLWK VDJHEUXVK JUDVVODQG SLQ\RQ MXQLSHU DQG P RXQWDLQ P DKRJDQ\ KDELWDW W\SHV 6WHHS VLGH KLOOV KDELWDW WKDW Z RXOG VXSSRUW ULSDULDQ VSHFLDOLVWV LV OLP LWHG DQG LV UHVWULFWHG WR SDWFKHV DORQJ D P LOH VHFWLRQ RI) RXUP LOH &UHHN DQG DORQJ + RUVH &UHHN LQ DUHDV P DSSHG DV DOOXYLDO YDOOH\ ERWWRP &OLII DQG URFN\ RXWFURS KDELWDW LV DOVR SUHVHQW DQG VXSSRUWV QHVWLQJ UDSWRUV DQG OLNHO\ RWKHU ELUGV DVVRFLDWHG Z LWK URFN\ KDELWDW

%DVHG RQ JHRJUDSKLF UDQJH DQG KDELWDW UHTXLUHP HQWV %&& WKDW RFFXU RU DUH H[SHFWHG WR RFFXU LQ WKH + & &8 (3 DUHD LQ WKH VSULQJ VXP P HU EUHHGLQJ VHDVRQ LQFOXGH &DOOLRSH KXP P LQJ ELUG *Selasphorus calliope* JUHHQ WDLOHG WRZ KHH *Pipilo chlorurus* ORQJ ELOOHG FXUOHZ *Numenius americanus* VDJH VSDUURZ *Artemisiospiza belli* DQG 9 LUJLQLD¶V Z DUEOHU *Oreothlypis virginiae* 0 RXUQLQJ GRYH *Zenaida macroura* LV D * %%/ & WKDW Z RXOG RFFXU LQ WKH + & &8 (3 DUHD \HDU URXQG

,Q DGGLWLRQ VSHFLHV RI UDSWRUV W\SLFDOO\ DVVRFLDWHG Z LWK RSHQ FRXQWU\ DQG Z RRGODQG KDELWDWV DUH NQRZ Q RU H[SHFWHG WR RFFXU LQ WKH + & &8 (3 DUHD 6HH WKH : LOGOLIH 5 HSRUW IRU D OLVW RI UDSWRU VSHFLHV WKDW P D\ XVH WKH + & &8 (3 DUHD * ROGHQ HDJOH *Aquila chrysaetos* DQG EDOG HDJOH *Haliaeetus leucocephalus* DUH %/ 0 VHQVLWLYH VSHFLHV DQG WKH\ DOVR UHFHLYH DGGLWLRQDO SURWHFWLRQ XQGHU WKH %DOG DQG * ROGHQ (DJOH 3URWHFWLRQ $ FW %* (3$ * ROGHQ HDJOHV DUH NQRZ Q WR QHVW LQ DQG DURXQG + & &8 (3 DQG EDOG HDJOHV P D\ IRUDJH LQ WKH + & &8 (3 DUHD LQ Z LQWHU P RQWKV

$ HULDO UDSWRU QHVW VXUYH\ V KDYH EHHQ FRQGXFWHG DQQXDOO\ Z LWKLQ + & &8 (3 DQG D VXUURXQGLQJ P LOH DUHD VLQFH : LWKLQ + & &8 (3 WKHUH DUH IRXU UDSWRU QHVWV WKDW KDYH UHFHQWO\ EHHQ DFWLYH DQG IOHGJHG \RXQJ RQH JROGHQ HDJOH QHVW ORFDWHG LQ WKH ROG + RUVH &DQ\RQ 0 LQH VDWHOOLWH SLW WZ R DFWLYH UHG WDLOHG KDZ N *Buteo jamaicensis* QHVWV LQ + RUVH &DQ\RQ DQG 5 HG + LOOV DUHDV DQG RQH SUDLULH IDOFRQ *Falco mexicanus* H\ ULH LQ WKH Z HVWHUQ SDUFHO RI + & &8 (3

: LWKLQ D RQH P LOH EXIIHU RI WKH + & &8 (3 ERXQGDU\ WKHUH DUH WZ R IHUUXJLQRXV KDZ N *Buteo regalis* QHVWV WKDW KDYH UHFHQWO\ EHHQ DFWLYH &RQVLGHULQJ D P LOH DUHD IURP + & &8 (3 IRU JROGHQ HDJOHV WKHUH DUH DQ DGGLWLRQDO QLQH JROGHQ HDJOH QHVWV IRXU RI Z KLFK KDYH EHHQ DFWLYH LQ WKH SDVW WZ R \HDUV 1 RWDEO\ QR UDSWRU QHVWV KDYH EHHQ REVHUYHG RQ WKH FOLIIV RI 0 RXQW 7 HQDER 7 KH DUHD KDV EHHQ VXUYH\ HG WKUHH WLP HV VLQFH 7 KH FOLIIV DUH H[SRVHG WR WKH Z HVW DQG VXEMHFW WR KLJK Z LQGV DQG GULYLQJ VQRZ Z KLFK P D\ SUHFOXGH WKHP IURP EHLQJ XVHG E\ QHVWLQJ UDSWRUV * %(6HH WKH : LOGOLIH 5 HSRUW IRU P RUH GHWDLO RQ UDSWRU QHVWV LQ + & &8 (3

Burrowing Owl

: LWKLQ D RQH P LOH EXIIHU RI WKH + & &8 (3 ERXQGDU\ WKHUH LV D EXUURZ LQJ RZ O EXUURZ WKDW KDV UHFHQWO\ EHHQ DFWLYH) ROORZ LQJ D GHVNWRS DWWHP SW WR GHWHUP LQH DUHDV RI VXLWDEOH KDELWDW ILHOG VXUYH\ V Z HUH FRQGXFWHG WR GHWHUP LQH LI EXUURZ LQJ RZ OV DUH SUHVHQW LQ WKH + & &8 (3 DUHD $ SHGHVWULDQ VXUYH\ IRU YLVXDO DWWHP SW FRP ELQHG Z LWK D EURDGFDVW FDOO VXUYH\ Z DV

FRQGXFWG LQ + & &8 (3 EHZ HHQ - XO DQG $ XJ XW $ 5 &$ ' ,6 F 1 R EXUURZ LQJ RZ OVZ HUHGHWFWG DQG QR RFFXSLHG EXUURZ VZ HUHI RXQG LQ + & &8 (3 $ 5 &$ ' ,6 F 6 HHWKH: LOGOLH5 HSRUWRUP RUHGHWOORQ WKHEXUURZ LQJ RZ OVXUYH\ FRQGXFWG DW + & &8 (3

Bats

) LHOG VXUYH\ VZ HUHFRQGXFWG WKLGHQW\ VSHFLHVRI EDWXVLQJ WKH + & &8 (3 DUHD $ 5 &$ ' ,6 G) RORZ LQJ DGHWHWS DWHWP HQWWR GHWHUP LQHZ KHUHSRWQWDOEDWRUDJ LQJ DQG URRWLQJ KDELWWFRXOG H[LWWLQ WKH + & &8 (3 DUHD WZ R DFRXWFDOEDWP RQLWRULQJ WWWRQVZ HUH HWWEOXKHG 6LWW$ Z DVQHDUD KLWRUFDOOLWDQG SHUHQLDOZ DWUVRXUHVZ LWKLQ VJ HEUXK 6LWW %Z DVQHDUDSLWZ DOZ LWK URFN\ RXWURSVDQG FOLIVQHDE\ LQ SLQ RQ WKLSHUYHJ HWWRQ KLWRUFDOOLWDQG VKLJWZ HUHDOR LGHQWLHG DVRFFXUULQJ LQ WKHYLFLQW

' DWZ DVFRORHFWG IURP GXVNWR GDZ QIRUWZR FRQHFXWYHGD\ VGXULQJ WKUHHP RQLWRULQJ HYHQW -XO $ XJ XWDQG 2 FWREHU (LJ KWSHFLHVZ HUHSRWWYHO IGHQWLHG EDWHG RQ EDWFDOODQD0 VLV 5 HDWYHSHUFHQWRI WRWOSDWHVZ DVDOR UHFRUGHG 2 QH%/ 0 VSHFLDOWWXXVEDWSHFLHV GHWFWG OWWHEURZ QP \ RWW *Myotis lucifugus* Z DVQRVSUHYIRXVO IGHQWLHG DVKDYLQJ WKH SRWQWDOWR RFFXULQ WKH + & &8 (3 DUHDEDWHG RQ WKHGHWRS DWHWP HQW$ GGLWRQDOEDWSHFLHV JURXS GHWP IQDWRQVZ HUHP DGHRI WKRVHUHXOWWKDWFRXOG QRWEHIGHQWLHG WR WKHVSHFLHVOHYHO 7 KH VSHFLHVJURXSVZ HUHEDWHG RQ FDOOUHTXHQFLHV

5 HXOWVE\ VSHFLHVDUHDVIRORZ V

- %LJ EURZ QEDW *Eptesicus fuscus*
- 7 RZ QVHQG¶VEIJ HDUHG EDW *Corynorhinus townsendii*
- &DOLRUQLDP \ RWW *Myotis californicus*
- : HWWLQ VP DOOIRRWG P \ RWW *Myotis ciliolabrum*
- / RQJ HDUHG P \ RWW *Myotis evotis*
- / LWWHEURZ QP \ RWW
-) UQJ HG P \ RWW *Myotis thysanodes*
- / RQJ OHJ J HG P \ RWW *Myotis volans*

6 LWW$ \ IHOHG KJ KHUUHXOWWKDQ 6 LWW% Z KLFK Z DVFRQFOXGHG WR EHGXHWR 6 LWW$ ¶VSUR[IP LW WR Z DWU 6 HHWKH: LOGOLH5 HSRUWRUP RUHGHWOORQ WKHEDWXUYH\ FRQGXFWG DW + & &8 (3

$ IIHFWG (QYLURQP HQW6 SHFLDO6 WXXXV3 OODQW6 SHFLHV

7 KHUHDUHQR SODQWSHFLHVIHGHUDOO OWWG RUSURSRVHG IRUODWWQJ IRU(XUHND DQG/ DQGHU FRXQWHV 7 KH1 HYDGD1 DXXUDO+ HUUW H3URJ UP 1 1 + 3 Z DVFRQWFWG WR REWQ WKHP RWW FXUUHQWSHFLHVGDWP DQWQHG IQ WKHUGDWEDVHIRU1 HYDGD¶VDWUVN UUH HQGDQJ HUHG DQG WKUHDWQHG VSHFLHV $ UHSRQHZ DVUHFHLYHG RQ 0 DUFK %DVHG RQ WKH* ,6 GDW UHFHLYHG WKHUHZ DVRQH VSHFLDOWXXVSODQWSHFLHVRFFXUUHQFHIQ WKH + & &8 (3 DUHD %HDWWH

EXFNZ KHDW*Eriogonum beatleyae* 7 KLVLVD%/ 0 VHQMWWH VSHFLHVIRUWKH%0 ' %/ 0 F DQG KDVEHHQ GRFXP HQWHG LQ XSSHU+ RUVH&DQ\RQ

7 KH%/ 0 QDWW VHQMWWH SODQWVSHFLHVIRUWKH%0 ' DQG IRUWKH(QR' LVWUFW%/ 0 F 2 I WKHVH VL[VSHFLHVKDYHEHHQ FRQVLGHUHG IRURFFXUUHQFHLQ UHFHQWXXLYH VRI + & &8 (3 2 QO WKH%HDWWH EXFNZ KHDWKDVEHHQ IRXQG %XFNQHU

%HDWWH EXFNZ KHDWKDVEHHQ IRXQG LQ QDWXUHDQ UHFDLP HG DUHDVDVUHFHQWV DV %XFNQHU ,WVVNQRZ QWR RFFXULQ URFN\ DUHDVRI VKUXEODQG DQG FKDSDUUDOKDEWWV 1 DWXUH\LYH 6HYHUDOVP LOODUVSHFLHVRI *Eriogonum* KDYHDOR EHHQ GRFXP HQWHG %HDWWH EXFNZ KHDW KDVEHHQ HQFRXQWHUHG DWWFDWWUHG GRFDWRQVWKURXJKRXW+ & &8 (3 Z KLOHIFRQGXFWQJ JHQHUDO YHJHWDWRQ LQYHQWRUHV ,WSSHDUVWR GR Z HOOLQ GLWXUEHG DUHDV LQFOXGLQJ WKH H[WHQVLYHEXLQHG DUHDVZ LWKLQ+ & &8 (3 Z KLFK LVWSIFDORI P DQ\ RWKHUEXFNZ KHDWSHFLHV ,WKDVEHHQ HQFRXQWHUHG HOWHZ KHUHLQ WKH&RUW[0 RXQWDLQVLQ(XUHND&RXQW %XFNQHU

(QYLURQP HQWDO&RQVHUXHQFHV6 SHFLDO6 WDWXV6 SHFLHV

3 URSRVHG $ FWRQ

* HQHUDOIP SDFWWR Z LOOGDLH WKDWP D\ RFFXUDVDUHXXOWRI WKH3URSRVHG $ FWRQ DUHGHFUHEHG LQ 6HFWRQ 1 R WKUHDWHQHG RUHQGDQJHUHG VSHFLHVRFFXULQ WKH+ & &8 (3 DUHD WKHUHRUH WKHUHZ RXOG EHQR IP SDFWWR WKHVH VSHFLHV 2 QHFDQGLGDWH VSHFLHV WKHJ UHDWUVDJ HJ URXVH P D\ EHDIIHFWHG DVGLVFXVVHG EHORZ

3 URFHGXUHVWR P LQLP LI]HIP SDFWWR VSHFLLF Z LOGDLH VSHFLHVDQG RUSDUWFXODUZ LOGDLHKDEWWW IHDXUHVDUHLQFOXGHG LQ WKHDSSOLFDQWFRP P LWWHG(30 VDVSDUWRI WKH3URSRVHG $ FWRQ 6HFWRQ 7 KHVHLQFOXGHDQXDOFWWLW VXUYH\ V 7 KHVHDOR LQFOXGHVHDVRQDODQG RU\SDWWO UHWWFWRQVDURXQG DFWWYHP LJ UDWU EILG QHWW DFWYHUDSWRUQHWW J UHDWUVDJ HJ URXVHOPNV DQG VSUQJ V 7 KHUHDUH VSDWDOUHWWFWRQVIRUEDWQHDUP LQHDGLW VKDLW DQG FDYHV 7 KHVH P HDXUHVDUHGLVFXVHG LQ P RUHGHWDLOEHORZ E\ VSHFLHV

Migratory Birds

$ VRWWORI DFUHVKDYHEHHQ GLWXUEHG DFUHVRI Z KLFK KDYHEHHQ UHFRQWRXUHG DQG VHHGHG KRZ HYHU QRQHRI WKLVDFUHDJ HKDVEHHQ UHPDVHG IURP WKHUHFOP DWRQ DWXUDQFHE\ %/ 0 RUWKH 1 ' (3 7 KHVXUDFHGLWXUEDQFHKDVUHXXOWHG LQ DUHGXFWRQ RI P LJ UDWU EILG QHWWQJ DQG IRUDJ LQJ KDEWWW7 KH3URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVZ RXOG UHXXOWQ DQ DGGLWRQDO UHGXFWRQ RI P LJ UDWU EILG QHWWQJ DQG IRUDJ LQJ KDEWWW

+ DEWWWORW Z RXOG SHUWXXQWOUHFOP DWRQ KDVEHHQ FRP SOHWHG 7 R P LQLP LI]HGLWXUEDQFH IP SDFWWR EUHGLQJ EILGV %DUUFN KDVFRP P LWWHG WR FRQGXFWQJ SUHGLWXUEDQFHP LJ UDWU EILG QHWWXXLYH VLQ WKH VSULQJ DQG HWWEOWKLQJ H[FXUVRQ]RQHV DURXQG DFWYHQHWWDVSDUWRI WKH DSSOFDQWFRP P LWWHG(30 V $ GGLWRQDOO VXUDFHGLWXUEDQFHFOHDUDQFH VXUYH\ VZ RXOG EH FRQGXFWHG IRORWZ LQJ %/ 0 : LOGDLH3URWFRQV %/ 0 F Z KHQ DSURSRVHG DFWYLW Z RXOG LQYROYH JURXQG GLWXUEDQFH GXULQJ WKHQHWWQJ VHDVRQ GHLQHG E\ %/ 0 DV0 DUFK WKURXJK-XO %DVHG RQ WKHORFDO]HG DQG LQFUHP HQWDOQDWXUHRI WKH3URSRVHG $ FWRQ WKHDEOHW RI EILGVWR P RYHWR RWKHUDUHDVRI + & &8 (3 WKHRYHUOODYLQJDEOW RI VDJHEUXVK Z RRGODQG DQG JUDVOODQG

KDEWDWQ RWKHUSRUWRQVRI WKH&RUW] 0 RXQWDLQV DQG IP SOHP HQWDWRQ RI DSSOLFDQWFRP P LWWHG (30 V LWVXQDNHO WKDWKDEWDWHGXFWRQV QRLVH RUKXP DQ SUHVHQFH UHVXOWQJ IURP WKH 3URSRVHG $FWRQ Z RXOG KDYH DP HDXUDEOHIP SDFWRQ P LJ UDWU EILG SRSXODWRQVIQ WKHDUHD

7KHSURSRVHG SIQ\ RQ MXQLSHUJ UHDWUVDJ HJ URXVH(30 P D\ UHXOWQ VKRUWWHUP WP SRUDU\ GLWXUEDQFH WR Z ILOOLHGXUQJ WKHIP SOHP HQWDWRQ SKDVH $VRXWQHG IQ 6HFWRQ WX P IQIP LJ HIP SDFW WX P LJ UDWU EILGV VDWWXUYH\ VZ RXOG EHFRQGXFWHG IURP 0 DUFK WWKURXJK -XO WWE\ DTXDOLIHG EIRORJ DWWX GHWHP IQHWKHSUHVHQFHRI QHWQJ EILGV &UHZ P HP EHUV Z RXOG EHWDDQHG WX IGHQW\ QHWQJ EILG EHKDYIRUDQG IQWXXFWHG WX IQVSHFWWHHVIRUQHWWEHRUH FXWQJ WX GDWWKVVKDVEHHQ WKHP RWWHIHFWYHWWDWW\ IRUDYRIGIQJ IP SDFW WX WHHQHWQJ EILGV

Raptors

7KHSUIP DU IP SDFWWX UDSWRUVSHFIHVIQ+&&8(3 KDVEHHQ DQG Z RXOG EHIURP GLWXUEDQFHRI QHWWIWWVDQG ORWVRI IRUDJIQJ KDEWDW 6HDVRQDODQG VSDWDOUHWWFWRQVRQ GUIOQJ DQG VXUDFH GLWXUIQJ DFWYIWHVDURXQG DFWYHUDSWRUQHWVDUHIQFOXGHG IQ WKHDSSOLFDQWFRP P LWWHG (30 V DQG Z RXOG P IQIP IJ HQRIVHDQG KXP DQ SUHVHQFH DURXQG QHWV / RWVRI IRUDJIQJ KDEWDW Z RXOG EH WP SRUDU DVGLWXUEHG DUHDVZ RXOG EH UHFOPP HG) XUWKHUP RUH UHFOP DWRQ DFWYIWHVIQ DUHDV WKDWKDYHSUHYIRXVO EXIQHG P D\ IP SURYHKDEWDWYRUSUH VSHFIHV WKXVKDYIQJ DQ IQGIUHFW SRVWYHHIHFWRQ UDSWRUV) RUWKHUHDVRQVWDWG DERYH HIHFWRI WKH3URSRVHG $FWRQ RQ UDSWRU SRSXODWRQVDUHQRWDQWFISDWG

Greater Sage-grouse

* UHDWUVDJ HJ URXVHKDEWDWRFFXUVIQ WKH+&&8(3 DUHD 7KH3URSRVHG $FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUDFHGLWXUEDQFHFRXOG UHXOWQIP SDFW WX JUHDWUVDJ HJ URXVH KDEWDWGHSHQGIQJ RQ WKHORFDWRQ RI IXWXUHGUIOQJ DQG GUIOURDG FRQWXFWRQ / RWVRI JUHDWU VDJ HJ URXVHKDEWDWDVDUHXOWRI WKH3URSRVHG $FWRQ IRUWKHDGGLWRQDO DFUHVZ RXOG EH ORFDO]HG DQG UHFOP DWRQ Z RXOG UHWRUHYHJ HWDWRQ IRORZ IQJ GLWXUEDQFH ,QDUHDVEXIQHG E\ WKHZ IOGILH KDEWDWP D\ EHIP SURYHG UHXOWQJ IQ DSRVWYHIP SDFWWX JUHDWUVDJ HJ URXVH KDEWDW

7KHSURSRVHG (30 VWX P IQIP IJ HHIHFWRQ JUHDWUVDJ HJ URXVHIQFOXGHVRSWRQVIRUSIQ\ RQ MXQLSHUWHDW HQWSOFFHP HQWRI IQJ KWGHWUHQWRQ IHQFHV SOFFHP HQWRI H[FORVXUHVDURXQG VSUIQJ V P HDGRZ V DQG UISDUDQ DUHDV DQG SD\ P HQWDFFRUGIQJ WX WKH* UHDWU6DJ HJ URXVH0 2 8 VHH6HFWRQ DQG $ **SSHQGIX (**

7UHDW HQWRI HQFURDFKIQJ SIQ\ RQ MXQLSHUWRQGVWX IP SURYHJ UHDWUVDJ HJ URXVHKDEWDWFRXOG EH IP SOHP HQWG WX DFFRXQWRUSDWGLWXUEDQFH 7UHDW HQWRI HQFURDFKIQJ SIQ\ RQ MXQLSHUWRQGV WX IP SURYHJ UHDWUVDJ HJ URXVHKDEWDWFRXOG DOR EHIP SOHP HQWG WX DFFRXQWRUWHSURSRVHG DGGLWRQDO DFUHVRI GLWXUEDQFH) RUWKHSXUSRVHRI HVWP DWQJ J UHDWUVDJ HJ URXVH IP SURYHP HQWDFUHDJ H WKH DFUHVRI GLWXUEDQFHIQ H[FHHGDQFHRI WKHOHYHODXWRUI]HG 3QDQ 0 RGLIIFDWRQ DQG $GGHQGXP DQG WKH DFUHVRI SURSRVHG DGGLWRQDOH[SORUDWRQ 3QDQ $ P HQGP HQWDUHDIVDVXP HG WX DOORFFXUIQJ UHDWUVDJ HJ URXVHKDEWDW

7 KHJ UHDWMUVDJ H J URXVHKDEWWWGLWXUEDQFHDFUHDJ HLVDFFRXQWWG IRUDWD UDWR 7 KLVLVWKH
OHYHORXWLQHG LQ WKH* UHDWMU6 DJ H J URXVH0 2 8 %/ 0 HWDO VLJ QHG E\ %/ 0 DQG %DUUFN
,P SOHP HQWLQ WKHSLQ RQ NXQLSHUWHDW HQWRSWRQ RI WKH(30 FRXOG UHXXOWLQ DSSUR[IP DWH)
DFUHVRI KDEWWWP SURYHP HQWDFWXLW> DFUHVRI H[FHHGDQFHGLWXUEDQFH
DGGLWRQDOH[SORUDWRQ GLWXUEDQFH DFUHVWRWW@ 3LQ RQ NXQLSHUWHDW HQWZ RXOG QRW
RFFXUZ LWLQ DIRXUP LOHEXIIHUIURP DFWXYHOHNVIURP 0 DUFK WKURXJK-XQH WR P LQIP I]HWKH
SRWQWDOIRUIP SDFWWR EUHGLQ DQG QHWQ J UHDWMUVDJ H J URXVH 0 IJ UDRU\ EILG VXLYH V
Z RXOG EHFRQGXFWWG EHZ HHQ0 DUFK DQG-XO WR P LQIP I]HIP SDFWWR EUHGLQ P IJ UDRU\
EILGVIQFOXGLQJ UDSWRUV

7 KLVLVDFRQVHLYDWYHDSSURDFK EHFDXVHSDWWGLWXUEDQFHP D\ QRWKDYHRFFXUUHG Z LWLQ J UHDWMU
VDJ H J URXVHKDEWWWDQG SRWQWDOIXWXUHGLWXUEDQFHP D\ QRWRFFXUIQ J UHDWMUVDJ H J URXVH
KDEWWW 7 KH%/ 0 P D\ HDFWWR FRQGXFWWHG YHUIIFDWRQVRI RQ WKH J URXQG FRQGLWRQV
HSHFLDOO IQ DUHDVZ KHUH WKHUHIVQRW FRQFXUUHQFHRI QRQ KDEWWWRUJ UHDWMUVDJ H J URXVH
DFFRUGLQJ WR WKHUHFHQW 6* 6 J UHDWMUVDJ H J URXVHKDEWWWP DS &RDWWVHWDO (6&2
J UHDWMUVDJ H J URXVHKDEWWWP DS $ FXDOJ UHDWMUVDJ H J URXVHIP SURYHP HQWDFUHDJ HP D\ EH
DGYXWWG EDVHG RQ WKRVH%/ 0 IIHG LQYHWW DWRQV 7 KH%/ 0 Z RXOG FRP P LWWR FRQGXFWWQ DQ\
VXFK J UHDWMUVDJ H J URXVHKDEWWWIHG LQYHWW DWRQVSURUWR WKHIQLWDWRQ RI VXUDFHGLWXUEIQJ
DFWXYLWHV

7 KHREMFWXYHRI WKHQRLVHWXG\ Z DVWR FKDUDFWUL]HDQG TXDQWY\ WKHFXUUHQWQRLVHHQYLURQP HQW
DURXQG WZ R DFWXYHOHNVORFDWG QHDUWKH+ & &8 (3 DUHD + RUVH&UHHN DQG 1 HZ %URFN
&DQ\RQ 7 KHH[LWWQJ OHYHORI H[SORUDWRQ DFWXYLW DW+ & &8 (3 Z DVFRQGHUHG SDUWRI
DP EIHQWFRQGLWRQV 0 HDXUP HQWRI DP EIHQWQRLVHFRQHFWG GXUQJ WKHOHNNQJ SHUURG
GRFXP HQWG WKDWQFUHDVHVIQ QRLVHOHYHOVZ HUHSUP DUQ DWXEXWG WR IQFUHDVHVIQ Z IQG VSHGV
([SORUDWRQ UHDWG QRLVHKDVQRWEHHQ IGHQWIHG DVFRQWEXWQJ WR IQFUHDVHVIQ DP EIHQWQRLVH
1 RLVHHIIHFWDUHH[SHFWG WR EHORFDQ]HG ,P SOHP HQWWRQ RI WKHDSSOFDQWFRP P LWWG (30
WKDWSOFHVDOOP IWRQ WKHDOOR Z DEOHDP RXQWRI IQFUHDVHIQ DP EIHQWQRLVHDERYH WKHHXXEOWKHG
DP EIHQWWKUHVKROG Z RXOG P IQIP I]HSRWQWDOQRLVH UHDWG IP SDFWGXHWR H[SORUDWRQ DFWXYLWHV
6HFWRQ

%DVHG RQ UHXXOWVRI QRLVHP RQ WRUIQJ DQG WKHDSSOFDQWFRP P LWWG (30 VDQG UHFOP DWRQ SODQV
IQ SOFH QR ORQJ WWLP SRSXOWRQ OHYHOIP SDFWRUOHN DEDQGRQP HQWVH[SHFWG DVDUHXOWRI
WKH3URSRVHG $ FWRQ

Pygmy Rabbit

7 KHH[LWWQJ DFUHVRI VXUDFHGLWXUEDQFHKDYHQRWP SDFWG NQRZ QS\ J P \ UDEEIWKDEWW
7 KH3URSRVHG $ FWRQ RI DQ DGGLWRQDO DFUHVFRXOG SRWQWDOO IP SDFWS\ J P \ UDEEIWKDEWWWI
VXUDFHGLWXUEDQFHZ HUHWR RFFXUIQ WKHVRXWZ HWWIQ DUHDRI + & &8 (3 6XLWWEOHKDEWWWDQG
RFFXSIHG EXUURZ V\ WWP VDUHSUHVHQWQ WKLVSRUWRQ RI WKH+ & &8 (3 DUHD $ 5 &$ ' ,6 E

6IQFHS\ J P \ UDEEIWVDUHQRWEOHWR GLVSHUVHDFURWODUJ HDUHDVRI QRQ KDEWWWORWDQG
IUDJ P HQWWRQ RI VXLWEOHVDJ HEUXVK KDEWWWZ LWLQ + & &8 (3 P D\ DIIHFWQGLYGXDOV %DUUFN
Z RXOG QRWFRQGXFWXUDFHGLWXUEIQJ DFWXYLW Z LWLQ KDEWWWGHQWIHG DVVXLWEOHWR VXSSRUW

S\ J P \ UDEEIWXQWDOD SUH GLWXUEDQFHVXUYH KDVEHHQ FRQGXFWHG ,I DFWXYHEXURZ VDUH IGHQWLIHG %DUUIFN Z RXOG QRW\ %/ 0 WR HYDOXDWH WKHSRWHQWDOIP SDFWDQG FRRUGLQDWH Z LWK %DUUIFN WR GHYLVHDQG IP SOHP HQWP HDXUHV WR P IQIP I] HIP SDFW WR WKHS\ J P \ UDEEIWDQG LW KDEIWDW 7 KHVHP HDXUHVP D\ IQFOXGHDYRIGDQFHRI DUHDV VXUURXQGLQJ RFFXSIHG EXURZ V Z KIFK Z RXOG SURYLGHP IWJ DWRQ WR DYRIG IP SDFWQJ WKLV VSHFIHV

Burrowing Owl

7 KLV VSHFIHVZ DVQRWGHWHFWHG GXULQJ EDVHOLQHVXUYH V ,WLVQRWDNHO WKLV VSHFIHVZ RXOG EH DIIHFWHG E\ H[SORUDWRQ DFWYLWHV

Bats

$ SSOFDQWFRP P LWHG (30 VIQFOXGHDYRIGIQJ GUOOQJ Z LWIQ IHHWRI DGLW VKDIWRSHQIQJ V RU FDYHVDQG DYRIGDQFHRI VHHSV VSUIQJ VDQG Z HOOQGV 1 R GIUHFWP SDFW KDYHRFFXUUHG RUZ RXOG RFFXUWR URRWWQJ KDEIWWDQG VHHS VSUIQJ Z HOOQG IRUDJIQJ KDEIWWDQG IQGIUHFWP SDFW FDXVHG E\ QRIVHDQG KXP DQ SUHVHQFHZ RXOG EHP IQIP I] HG E\ WKH IRRWWHWEDFN 2 WKHUVKXEOQQG Z RRGOQG DQG J UDVOQG IRUDJIQJ KDEIWWKDYHEHHQ RUZ RXOG EHIQFUHP HQWOO UHGXFHG GXUIQJ H[SORUDWRQ EXWUHOOP DWRQ Z RXOG HOP IQDWUHWGXDOHIHFW / IJ KWQJ RFFXUIQJ GXUIQJ QJ KWP HRSHUDWRQVP D\ WP SRUDUO DWUDFWQVHFW DQG WKXVIRUDJIQJ EDW EXWDJ KWQJ V\ WWP VDWKHGUOOSDGVDUHUHDWYHO VP DOOQG ORFDO]HG 6IQFHURRWWQJ VDWWVKDYHEHHQ DYRIGHG IWJ XQOQHO WKDWQJ KWQJ KDVIP SDFWWG URRWWQJ VDWWVRUIQWUHHG Z IWK FIUFDGIDQ UK\ WKP V 7 KHEDWXUYH IRXQG WKDWWHYHUDOEDWSHFIHVDUHXVIQJ WKH+ & &8 (3 DUHDGXUIQJ FXUHQWOOYHVRI H[SORUDWRQ DFWYIW 2 I WKHVZR EDWXUYH ORFDWRQV WKHGHWFWRUFORVHWWR D Z DWUVRXUFH\ IHOHG WKHP RWWEDWXVH * IYHQ WKHZ IGHSUHDG DYDIOEIOW RI VXIWEOHIRUDJIQJ KDEIWWDQG DSSOFDQWFRP P LWHG (30 V WKH H[IWQJ DFUHVRI VXUDFHGIWXUEDQFHKDVQRW KDG P HDXUEOHIP SDFWRQ EDWSHFIHV

) RUWKH3URSRVHG $ FWRQ RI DQ DGGIWRQDO DFUHVRI VXUDFHGIWXUEDQFH URRWWQJ VIWWZ RXOG FRQWXHWR EHDYRIGHG ,WIVXQOQHO WKDWQJ KWQJ Z RXOG IP SDFWURRWWQJ VIWWVRUIQWUHH Z IWK FIUFDGIDQ UK\ WKP V * IYHQ WKHZ IGHSUHDG DYDIOEIOW RI VXIWEOHIRUDJIQJ KDEIWWDQG DSSOFDQWFRP P LWHG (30 V WKH3URSRVHG $ FWRQ RI WKHDGGIWRQDO DFUHVRI VXUDFH GIWXUEDQFHZ RXOG QRWKDYHP HDXUEOHIP SDFWRQ EDWSHFIHV

Special Status Plant Species

7 KHUHDUHQR IHGHUDOO OIWWG SODQWSHFIHVNQRZ Q WR RFFXUIQ + & &8 (3 2 I WKH1 HYDGDOOWWG DQG %/ 0 VHQWIWYH VSHFIHV %HDWWH EXFNZ KHDWKDVEHHQ IRXQG IQ + & &8 (3 ,WIVUHSRUWG DV RFFXUIQJ IQ VHYHUDOORFDWRQV IQFOXGIQJ QDWYHDQG UHFOOP HG DUHDV * IYHQ IWVVHP IQJ WRPHUDQFHRI GIWXUEDQFHDQG DSSDUHQWOOIIQIW IRUORZ FRP SHWWRQ VIWWVDWRFIDWG Z IWK GIWXUEDQFH IQFOXGIQJ UHOOP DWRQ %XFNQHU WKH H[IWQJ DFUHVRI GIWXUEDQFHKDV QRWUHVXOWG IQ DQHJ DWYHIP SDFWRQ WKH%HDWWH EXFNZ KHDW

7 KH3URSRVHG $ FWRQ RI DQ DGGIWRQDO DFUHVRI GIWXUEDQFHIVQRWDQWFISDWG WR UHVXOWQ D QHJ DWYHIP SDFWRQ WKH%HDWWH EXFNZ KHDW7 KH3URSRVHG $ FWRQ Z RXOG KDYHQR HIIHFWRQ VSHFIDOWWXVSOQQW

7 KHSURSRVHG(30 WR P LQLP L]HHIIHFWRQJ UHDWLUVJ HJ URXVHLQFXGHV WKHRSWRQIRUUHP RYDO RI HQFURDFKLQJ SLQ RQ MXQLSHUWWQGV 7 KLVDFWWLW Z RXOG QRWDNH DIIHFW%HDWH EXFNZ KHDW DVWLQQLQJ Z RXOG EHGRQHE\ KDQG ,P SDFWWR VSHFLDOWWXVSODQWZ RXOG QRWRFFXU

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ$ OWHUQDWLYH H[SORUDWRQ DQG UHFOP DWRQ DFWLWLHVZ RXOG RFFXURQ\ IQ RSHQ DQG DFWLYHDUHDV 7 KH3URSRVHG $ FWRQZ RXOG QRWHDSSURYHG 7 KHUHZ RXOG EHQR DGGLWRQDOORWRI KDEWDW 2 QJ RLQJ IP SDFWWR VSHFLDOWXVZ LOOLHZ RXOG EHOP LWG WR GLWXUEDQFHDWRFLWG Z LWK QRLVHDQG KXP DQ SUHVHQFH 7 KHDSSOFDQWFRP P LWWG(30 VIRU Z LOOLHZ RXOG FRQWQXHWR EHIP SOPP HQWG Z KIFK Z RXOG P LQLP L]HWKHHIIHFWIURP QRLVHDQG KXP DQ GLWXUEDQFH 5 HFOP DWRQ Z RXOG FRQWQXH Z KIFK Z RXOG UHSOFHKDEWDWDIIHFWG E\ SDWW H[SORUDWRQ DFWLWLHV DQG IP SURYHDUHDVZ KHUHKDEWDWZ DVORWGXHWR SDWWLUHHYHQW

1 R DGGLWRQDOVXUFHGLWXUEDQFHZ RXOG EHDXWKRU]HG XQGHUWKH1 R $ FWRQ$ OWHUQDWLYH 2 SHQ DQG DFWLYHDUHDVZ RXOG EHUHFOP HG RQFHH[SORUDWRQ DFWLWLHVDUHFRP SOHWG 6 SHFLDOWXVZ SODQWZ RXOG QRWEHDIIHFWG DVQR QHZ GLWXUEDQFHZ RXOG RFFXU 1 R[IRXVDQG IQYDLYHZ HHG FRQWROP HDXUHVZ RXOG FRQWQXHWR EHIP SOPP HQWG WR SUHYHQWKDEWWOR W 7 KH1 R $ FWRQ $ OWHUQDWLYHZ RXOG QRWUHXOWQIP SDFWWR VSHFLDOWXVSODQWSHFIHV

&XP XODWLYH(IIHFW

Proposed Action

: IOOLHZ RXOG QNHO DYRIG ORFDO]HG DUHDVZ LWKQ + & &8 (3 GXULQJ H[SORUDWRQ DFWLWLHV 2 WKHUSDWSUHVHQWDQG5)) $ VKDYHQNHO FDXVHG RUZ RXOG FDXVHWKHVP HEHKDYRUDOHIIHFW 6 SHFIHVWKDWUHP REIOHIDQG DEOHWR OYHIQ DYDUHW RI KDEWDWFRXOG DGDSWDQG SRSXODWRQ OHYHO HIIHFWRUORQJ WLP IP SDFWZ RXOG QRWRFFXU + DEWWDOWLDWRQ DQG WKHIQFUHDVHIQ KXP DQ SUHVHQFHDQG QRLVHZ RXOG RFFXUIRU \HDUV SOXVWZ R DGGLWRQDO\HDUVIRUUHFOP DWRQ 2 QFH H[SORUDWRQ IVFRP SOHWG DQG DUHDVDUHUHFOP HG KDEWDWZ RXOG EHUHWRUHG DQG VSHFIHVZ RXOG QNHO UHXUQ &XP XODWLYHIIHFWWR WKHVH VSHFIHVZ RXOG QRWEHDQWFLSDWG

%DVHG RQ WKHIIHGIQYHWW DWRQ RI J UHDWLUVJ HJ URXVHKDEWDWGRQHE\ (6&2 WKHUHKDVEHHQ J UHDWLUVJ HJ URXVHKDEWDWGLWXUEHG IQ + & &8 (3 DVDUHXOWRI WKH DFUHVRI H[LWWQJ GLWXUEDQFH $ GGLWRQDOJ UHDWLUVJ HJ URXVHKDEWDWFRXOG EHDIIHFWG DVDUHXOWRI WKH3URSRVHG $ FWRQIRUDQ DGGLWRQDO DFUHVGHSHQGLQJ XSRQ WKHORFDWRQ RI H[SORUDWRQ DFWLWLHV 7 KH SURSRVHGJ UHDWLUVJ HJ URXVHKDEWDWP SURYHP HQW(30 Z RXOG UHGXFH WKHWHIIHFW

7 KHUHDUHQR DFWLYHOHNVIQ WKH+ & &8 (3 ERXQGDU\ EXWDFWLYHOHNVDUHNQRZ QWR RFFXUZ LWKQ IRXUP IOHVRI WKH+ & &8 (3 DUHD 7 KHSURSRVHG J UHDWLUVJ HJ URXVH(30 Z RXOG OP LWWKH DP RXQWRI QRLVHIQFUHDVHDOORZ HG Z KIFK Z RXOG P IQLP L]HHIIHFWDWOHNVIURP QRLVHDQG KXP DQ SUHVHQFH

%DVHG RQ WKHDERYHDQDO\VLVDQG IIQGIQJ V IQFUP HQWDIP SDFWWR VSHFIDOWXVZ IOOLHVSHFIHV DQG WKHUKDEWDWDVDUHXOWRI WKH3URSRVHG $ FWRQ Z KHQ FRP EIQHG Z LWK WKHIP SDFWIURP WKH SDWWQG SUHVHQWFWRQVDQG5)) $ V DQG Z LWK WKHIP SOPP HQWDWRQ RI WKH%0 3VDQG(30 V DUH H[SHFWG WR EHP IQLP DOOQG QRWWJ QIIFDQW

7 KH3 URSRVHG $ FWRQ LVQRWDQWLFLSDWHG WR DIIHFWVHHFLDOWDXVSDQWVHHFLHV 7 KH3 URSRVHG $ FWRQ IRU+ & &8 (3 ILQFOXGHVUHFDOP DWRQ Z KLFK Z RXOG SUHYHQWRQ WLP UHMGXDOH IIHFW &XP XODWLYHIP SDFWVWR VSHFLDOWDXVSDQWVDUHQRWDQWLFLSDWHG

No Action

1 R DGGLWRQDOKDELWDWRRWZ RXOG RFFXUXQGHUWKH1 R $ FWRQ $ OWHUQDWLYH DQG UHFOP DWRQ Z RXOG JUDGXDOO UHWXUHKDELWDWVDVH[SORUDWRQ LVFRP SOHWHG 1 RLVHDQG KXP DQ SUHVHQFHP D\ FDXVH Z LOOOLHWR GLVSHUVHLQWR RWKHUDUHDV EXWWKLVHIIHFWZ RXOG LP ILQLVK DVH[SORUDWRQ LVWLP ILQLWHG &XP XODWLYHHIIHFWVWR VSHFLDOWDXVZ LOOOLHVSHFLHVDUHQRWDQWLFLSDWHG

7 KH1 R $ FWRQ $ OWHUQDWLYHZ RXOG QRWUHXOWLQIP SDFWVWR VSHFLDOWDXVSDQWV &XP XODWLYH HIIHFWVWR VSHFLDOWDXVSDQWZ RXOG QRWRFFXU

* UDJLQJ 0 DQDJHP HQW

7 KLVVHFWRQ SUHVHQWUHRXUFHVUHDWWR JUDJLQJ P DQDJHP HQWZ KLFK ILQFOXGHDOORW HQWDQG DWRFLDWHDFUHDJHVIRXQGILQ+ & &8 (3 DQG WKHSHUP LWWHG DFWLYH $ 8 0 VDWRFLDWHZ LWKHDFK DOORW HQW 7 KHDQDOVLVDUHIRUGLUHFWDQGILQDOHDFWP SDFWWR UDQ HDQG UHRXUFHVLVWKH + & &8 (3 3DQ ERXQGDU\ 7 KHFXP XODWLYHDWHVP HQWDUHDILQFOXGHVWKHDOORW HQWDQG DWRFLDWHG $ 8 0 VWKDWRFFXUZ LWKLQDQ H[WQG EH\ RQG WKH+ & &8 (3 3DQ ERXQGDU\

$ IIHFWHG (QYLUROP HQW* UDJLQJ 0 DQDJHP HQW

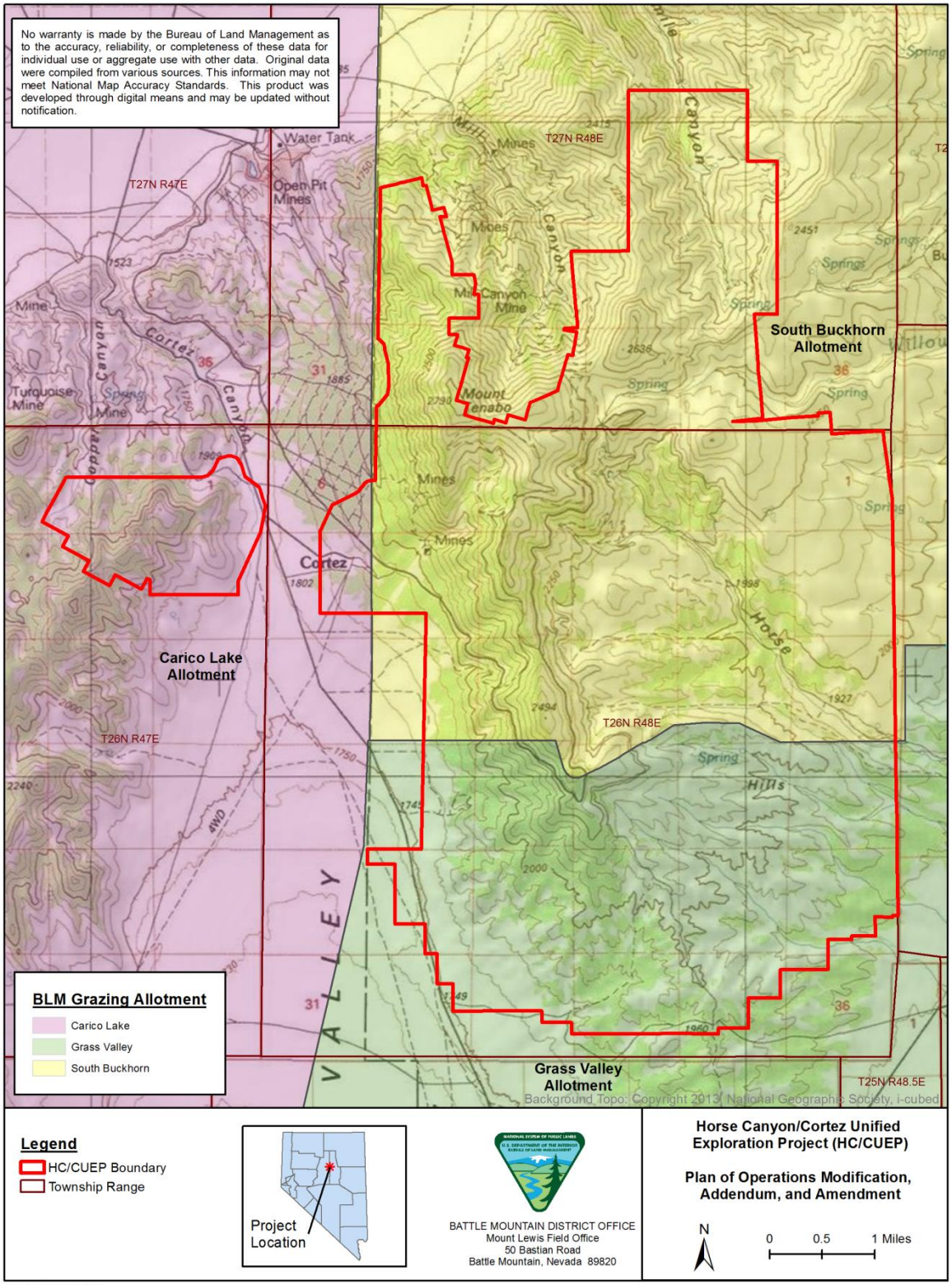
%/ 0 OYHWRFN P DQDJHP HQWREMHFWLYHVIRUWKH+ & &8 (3 DUHDSURYLGHGLUHFWRQIRU P DLQWDLQDQFHRUIP SURYHP HQWRI WKHFRQGLWRQ RI WKHSXEOF UDQ HDQGVWR HQKDQFHSURGXFWLYLW IRUDOOUDQ HDQG YDOXHV %/ 0 7 KH+ & &8 (3 DUHDILQFOXGHVWKUHHJUDJLQJ DOORW HQW WKH DOORW HQWERXQGDUHVH[WQG EH\ RQG WKH+ & &8 (3 ERXQGDU\ **) LJXUH** $ OORW HQWGHWDLOV DUHVKRZ QIQ **7 DEOH** .

7DEOH *UD]LQJ $OORWPHQW

$OORWPHQW %/0 0DQDJHPHQW 'LVWULFW	**7RWDO $FUHV 3XEOLF DQG 3ULYDWH 7RWDO 3HUPLWWHG DQLPDO XQLWPRQWKV $80V**	**$OORWPHQW $FUHV ZLWKLQ +&&8(3 3HUPLWWHG $80V ZLWKLQ +&&8(3**	**3HUFHQW RI $OORWPHQW LQ +&&8(3**
*UDVV 9DOOH\ %DWWOH 0RXQWDLQ %/0	SXEOLF ODQG DQG SULYDWH ODQG $80V SXEOLF ODQG	DFUHV $80V	
&DULFR /DNH %DWWOH 0RXQWDLQ %/0	SXEOLF ODQG DQG SULYDWH ODQG $80V SXEOLF ODQG	DFUHV $80V	
6RXWK %XFNKRUQ (ONR %/0	SXEOLF ODQG DQG SULYDWH ODQG $80V SXEOLF ODQG	DFUHV $80V	
7RWDO	SXEOLF ODQG DQG SULYDWH ODQG **$80V**	**$80V**	

3HUPLWWHG $FWLYH $80V ZLWKLQ +&&8(3 FDOFXODWHG DV DFUHV SHU $80 %/0 D

) LJXUH * UDJ LQJ $ OORW HQW



Date: 11/12/2014

(QYLURQP HQWDO&RQVHTXHQFHV* UDJLQJ 0 DQDJHP HQW

3 URSRVHG $ FWRQ

7 KHH[LWWQJ VXUDFHGLVXUEDQFHRI DFUHVKDVUHGXFHG VXUDFHJ UDJLQJ FDSDFLW WKDWZ RXOG VXSSRUW $ 8 0 V XVLQJ WKH WWQGDUG RI DFUHVSHU$ 8 0 %/ 0 D 7 KHUHDUH WRWO$ 8 0 VDYLQDEOHZ LWKLQ WKH+ & &8 (3 3OQ EERXQGDU 7 KHVXUDFHJ UDJLQJ FDSDFLW UHGXFWRQ RI $ 8 0 VLV SHUFHQWRI WKHWRWO$ 8 0 VZ LWKLQ+ & &8 (3 7 KHH[LWWQJ VXUDFH GLVXUEDQFHRI DFUHVKDVQRWHTXLUHG LVXXDQFHRI J UDJLQJ Z DLYHLVE\ %/ 0 1 R FKDQJHVWR FXUUHQW UDJLQJ P DQDJHP HQWRUOYHWRFNIP SURYHP HQWVKDYHEHHQ UHTXLUHG 7 KHDSSOFDQW FRP P LWWG (30 VIRUOYHWRFNDQG UDQJHDOORW HQW 6HFWRQ KDYHEHHQ IRORZ HG 3HUP LWWHVKDYHYROXQWULO QRWLHDEDVHG OYHWRFNIQWR UHFOIP HG DUHDVIQ+ RUVH&DQ RQ

7 KH3 URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUDFHGLVXUEDQFHZ RXOG UHGXFHVXUDFH J UDJLQJ FDSDFLW Z KIFK Z RXOG VXSSRUW $ 8 0 V 7 KLVZ RXOG QRWUHTXLUHLWXDQFHRI Z DLYHLVRU UHTXLUHFKDQJ HVWR FXUUHQW UDJLQJ P DQDJHP HQWSUDFWFHVRUOYHWRFNIP SURYHP HQW 7 KH VXUDFHJ UDJLQJ FDSDFLW UHGXFWRQ RI $ 8 0 VLV SHUFHQWRI WKHWRWO$ 8 0 VZ LWKLQ + & &8 (3 7 KHFKDQJ HIQ DUHD DYDLODEOHWR OYHWRFNZ RXOG EHQHJ OJ IEOH 5 HFOP DWRQ Z RXOG UHXUQ GLWXUEHG DUHDVWR WKHSUH GHYHORSP HQWDDQG XVHV Z KIFK IQFOXGHOYHWRFNJ UDJLQJ &KDQJHVWR UDQJHDDQG UHVRXUFHVDVDUHXXOWRI WKH3 URSRVHG $ FWRQ Z RXOG ODWWRU \ HDUV ,P SDFWVWR UDQJHDDQG UHVRXUFHVDUHDQWFIS DWG WR EHP IQIP DO

$ VSDUWRI WKH3 URSRVHG $ FWRQ IP SOHP HQWDWRQ RI WKHJ UHDWUUVDJ HJ URXVH(30 RI WHDWQJ SIQ RQ MXQ SHUVWW Z RXOG UHXOWQ YHJ HWDWRQ XQGHUWRUHVWKDWDUHOU HY IQWFW UP DWF FKDQJ HVIQ XQGHUWRU SOOQWFRP SRVWWRQ RUSURGXFWWWW DUHQRWDQWFIS DWG DQG KDYHQRWEHHQ REVHUYHG RQ VP IODUWHDWG VUWW IQ WKHSDWW0 RUHRYHU VIQFHJ URXQG GLWXUEDQFHE\ IRRWFUHZ V Z IWK FKDIQWZ VIVP IQIP DO DQG VIQFHOWWHFKDQ HIQ SRWWHDW HQWOYHWRFN XVHIVDQWFIS DWG VIJ QIIFDQWIQFUHDVHVIQ Z HG\ DQQXDOVDUHQRWH[SHFWG * UDJIQ P DQDJHP HQWRQOZ IQJ MXQ SHU FRQWROVKRXOG EHDGDSWWYHWR FKDQJ IQJ HQYIURQP HQWDDQG UHVRXUFHFRQGIWRQV 3 DWH[SHUHQFH Z IWK VP IODUSIQ RQ MXQ SHUWHDW HQW VXJ J HWW WKDWP DUNHG IQFUHDVHIQ OYHWRFN XVHRI WKH WHDWG DUHDRUGIWWEXWRQ RI OYHWRFN Z RXOG QRWRFFXU %DWV $ Q P DJ IQDOIQFUHDVHIQ XVHRI WKH WHDW HQWIWWE\ OYHWRFN IRORZ IQJ SIQ RQ MXQ SHUUP RYDOZ RXOG ONHO EHRIIVHW E\ WKH HIIHFWRI WKHWSSOHG WHHVIQ FUHDWQJ P IFURVWW IRUSURWFWRQ RI XQGHUWRU SOOQW &RQVHTXHQW WKHQHG IRUSRWWHDW HQWFORXUHRI WHDW HQWWWW WKOYHWRFN IVQRW DQWFIS DWG

,P SOHP HQWDWRQ RI WKH(30 WK IP SURYHJ UHDWUVDJ HJ URXVHKDEIWWWKURXJ K WKHSOOFHP HQWRI H[FORXUHVDURXQG VSUQJ V P HDGRZ V DQG UISDUDQ DUHDVP D\ UHTXLUHIXWKHUWWW SHFIIIF DQDO VIVDWWKHWP HRI IP SOHP HQWDWRQ

1 R$ FWRQ

([SORUDWRQ Z RXOG RFFXUIQ RSHQ DQG DFWYHDUHDVRQ\ XQGHUFXUHQWSHUP IWDQG DSSURYDOV &KDQJHVWR JUDJIQJ P DQDJHP HQWRUOYHWRFNIP SURYHP HQW Z RXOG QRWRFFXU $ VH[SORUDWRQ DFWYIWHVDUHFRP SOHWG UHOOP DWRQ Z RXOG UHXUQ GLWXUEHG DUHDVWR SUH GHYHORSP HQWDDQG XVHV Z KIFK IQFOXGHOYHWRFNJ UDJIQJ ,P SDFWVWR JUDJIQJ P DQDJHP HQW Z RXOG EHP IQIP DO

&XP XODWLYH(IIHFW

Proposed Action

7 KHDOWHUQDWLYHERXQGDULHVRI &DUIR / DNH * UDV9 DOOH\ DQG 6RXWK %XFNKRUQ H[WQGEH\RQG WKH + & &8 (3 ERXQGDU\ 3DWWSUHVHQWDQG5)) $ VVKRZ QLQ**7 DEOH** KDYHFDXVHG VXUDFH GLVWXUEDQFHDQG WKHUHRU KDYHDNHV DIIHFWG RUP D\ DIIHFWJ UDJLQJ P DQDJHP HQW,P SDFWVWR J UDJLQJ P DQDJ HP HQWURP H[SORUDWRQ DFWLYLWLHVDWRFDWG Z LWK WKHH[LWQJ DFUHVRI VXUDFHGLVWXUEDQFHKDYHDIIHFWG DSSUR[IP DWH\ SHUFHQWRI WKHWRWDODOWHQWDUHD LH &DUIR / DNH$ OWHUQW DFUHV * UDV9 DOOH\ $ OWHUQW DFUHV DQG 6RXWK %XFNKRUQ$ OWHUQW DFUHV

,P SDFWVWR J UDJLQJ P DQDJ HP HQWXQGHUWKH3 URSRVHG $ FWRQ RI DQ DGGLWRQDO DFUHVRI VXUDFH GLVWXUEDQFHZ RXOG DIIHFWDQ DGGLWRQDO SHUFHQWRI WKHWRWDODOWHQWDUHD 7 KHFXP XODWLYH HIIHFWZ KHQ FRQVLGHUHG UHDWWHWX RWKHUSDWWSUHVHQWDQG5)) $ V DQG FRP EIQHG Z LWK WKH IP SOHP HQWDWRQ RI (30 VDQG UHFOD P DWRQ SUDFWFHV Z RXOG QRWEH VJ QLIIFDQW

No Action

3DWWSUHVHQWDQG5)) $ VVKRZ QLQ**7 DEOH** KDYHDIIHFWG RUP D\ DIIHFWJ UDJLQJ P DQDJ HP HQW IQ WKHDOWHUQWZ KIFK RFFXUDFURVWWKHERXQGDU\ RI + & &8 (3 ,P SDFWVWR J UDJLQJ P DQDJ HP HQWXQGHUWKH1 R$ FWRQ Z RXOG DIIHFWXS WX DFUHV SHUFHQWRI WKHWRWDO DOWHUQWDUHD LH &DUIR / DNH$ OWHUQW DFUHV * UDV9 DOOH\ $ OWHUQW DFUHV DQG 6RXWK %XFNKRUQ$ OWHUQW DFUHV 7 KHFXP XODWLYHHIIHFWZ KHQ FRQVLGHUHG UHDWWHWX RWKHUSDWWSUHVHQWDQG5)) $ V FRP EIQHG Z LWK WKHIP SOHP HQWDWRQ RI (30 VDQG UHFOD P DWRQ SUDFWFHV Z RXOG QRWEH VJ QLIIFDQW

&XOWXUDO5 HVRXUFHV

7 KLVVHFWRQ SUHVHQWVWKHFXOWXUDOUHVRXUFHVRI WKH+ & &8 (3 DUHD IQFOXGLQJ WKHDUFKDHROR RJ IFDO DQG HWKQRJ UDSKIF KLWRU\ 7 KHDQDO VLVDUHD IRUGLUHFWIQGLUHFWDQG FXP XODWLYHHIIHFWIQFOXGHV WKHDUHDZ LWKIQ WKH+ & &8 (3 3DQ ERXQGDU\

$ IIHFWG(QYLUROP HQW&XOWXUDO5 HVRXUFHV

6HYHQW RQHFXOWXUDOUHVRXUFHIQYHQWRUHVKDYHEHHQ FRP SOHWG IURP UHVXOWQJ IQ SHUFHQWFRYHUDJ HRI WKH+ &&8 (3 DUHD 7 KHVHIQYHQWRUHVKDYHGRFXP HQWG FXOXUDO UHVRXUFHV RI Z KIFK UHVRXUFHVDUHHDJ IEOH SHQGIQJ HDJ IEOH RUXQHYDOXDWG IRU1 5 + 3

(QJ IEOHFXOXUDOUHVRXUFHV VSDQ WKHHQWLHKLWRU\ RI KXP DQ RFFXSDWRQ IQ WKHDUHD 1 DWXH $ P HUJFDQ VLWVIQGLFDWRFFXSDWRQ RI WKHDUHDXS WX \ HDUVDJ R $ UFKDHROR JIFDOVLWVIQ WKH + & &8 (3 DUHD VKRZ WKHWDQWLWRQ IURP OD J H GDWW]HG SURMFWDSRIQW WX WKHERZ DQG DUURZ DQG WKHIQWRGXFWRQ RI P IQOQJ VWRQHIP SOHP HQWDQG EURZ QZ DUHFHUP IFV %DVNHWW DQG SIQ RQ SIQHQXWKDYHWQJ DUHDWWWWG WX IQ ERWK WKHDUFKDHROR JIFDODQG HWKQRJ UDSKIF UHFRUG 1 DWXH$ P HUJFDQVZ HUHOYIQJ IQ WKHDUHDZ KHQ VIQYHUZ DVGLVFRYHUHG IQ

+ LWRUF DUFKDHROR JIFDOVLWVDUHOD J HO DWRFDWG Z LWK FUHDWRQ RI WKH&RUW[0 IQIQJ ' LWXUFW ' LWXUFWIQ 7 KH+ & &8 (3 DUHD FRQWQQVZ KDWZ HUHKLWRUFDO WKH' LWXUFW\VP RW

SURGXFWVYHP ICHV ICFXGLQJ WKH* DUUVRQ 6W/ RXLV DQG $ UFWF DVZ HOODVWKHUXLQVRI VZR RI WKH' LVWUFW¶VP ICOVDQG WKHJ KRWWRZ Q RI &RUW] 7 KHKICOVVXUXQGLQJ WKHP ICHVKDYHHYICHQFH RI FKDUFRDOSURGXFWRQ Z RRGFXWWQJ SUVVHFWQJ DQG OP HSURGXFWRQ : RUN ICWKH' LVWUFW Z DVSHJURUP HG E\ YDUXVHWKICF J URXSVICFXGLQJ &KICHMH 0 H[IFDQ DQG, WDDQ 7 KHKLVWRUF P ICICQJ ODQGVFDSHFRQWMQV \ HDUVRI P ICICQJ DGDSWDWRQ + RUVH&DQ RQ GHUYHVIURP + RUVH 5 DQFK DSURSHJW ICWKHFDQ RQ WKDWFDSXUHG DQG EUHG KRUVHVIRUXWRI WDWMP DUNHWICWKH V

7 KH' LVWUFWKDVEHHQ SURSRVHG DVD+ LWRUF ' LVWUFWRUWKH1 5 + 3 7 KH' LVWUFWVHDJ IEOHIRU ICFXVIRQ XQGHUFUWMUQ D IWDVRFIDWRQ Z LWKHYHQWVWKDWKDYHP DGHDVJ QIIFDQW FRQWEXWRQ WX EURDG SDWWMQVRI 8 6 KIWRU ICFXGLQJ VHWWP HQWDQG HWKICF KHUWJ H FUWMUQ E IWDVRFIDWRQ Z LWKSHRSOHWKDWKDYHP DGHDVJ QIIFDQW¶FRQWEXWRQ WX EURDG SDWWMQVRI KIWRU VSHFIIFDOO 6IP HRQ: HQEDQ : HQEDQ Z DVRQHRI WKHRUJ ICDOSURVSHFWRUVDQG SOD\ HG WKHP RWWP SRUWQWURHICQGHYHOSIQJ WKHP ICHVRI WKH' LVWUFW FUWMUQ F IWVVUHSUHHQWDWYH RI DVJ QIIFDQWDQG GLWQJ XLVKDEOHHQWW Z KRVHFRP SRQHQWP D\ ODFN ICQGLYGXDOGLWQFWRQ DQG FUWMUQ G IWKDV\ IHOHG RUIVOINHO WX\ IHOG ICIRUP DWRQIP SRUWQWX8 6 KIWRU 7 KH ' LVWUFWKDVVHYHUDOP ICOVUHSUHHQWQJ DQHDUO FRP SOHWWUHFUG RI WKHHYROXWRQ RI SUHFIRXV P HWOP ICOICQJ WFKQRORJ\ ICWKHZ HWDQG FRQWQVDUFKHRORJ IFDOWWVWKDWFDQ DGGUHVWWSIFV RI ODQGVFDSHWDQWRUP DWRQ P IJ UDWRQ DQG GDVSRUD DQG ICGXWDOFDSIWDWP 7 KH%/ 0 DQG 1 HYDGD6 + 32 FRQWGHUWKH' LVWUFWHDJ IEOHXQGHUDOOIRXUFUWMUD %/ 0 F

3 URSHUWHVRI &XOXUDORU5 HDJIRXV, P SRUWQFH

,Q WKH1 DWRQDO+ LWRUF 3 UHVHUYDWRQ $ FW1 + 3$ Z DVP HQGHG WX DOORZ IRUSURSHUWHVRI WDGLWRQDOUHDJIRXVDQG FXOXUDOIP SRUWQFH WX DQ,QGLDQ WUEH WX EHGHWMP ICHG DVHDJIEOHIRU ICFXVIRQ RQ WKH1 5 + 3 &RRGLQDWRQ EHWZ HHQ%/ 0 DQG ORFDO,QGLDQ WUEHVKDVUHXXOWG IQ WKH IGHQWIFDWRQ RI WZ R 3&5 , VICQ WKH+ & &8 (3 DUHD 0 RXQW7 HQDER : KIWW&OIIVDQG+ RUVH &DQ RQ %/ 0 F

0 RXQW7 HQDER IVHDJIEOHIRUICFXVIRQ XQGHUFUWMUQ D IWDVRFIDWRQ Z LWKHYHQWVWKDWKDYH P DGHDVJ QIIFDQW¶FRQWEXWRQ WX EURDG SDWWMQVRI : HWWMQ6KRVKRQHDQG8 6 KIWRU DQG FUWMUQ F IWVVUHSUHHQWDWYHRI DVJ QIIFDQWDQG GLWQJ XLVKDEOHHQWW Z KRVHFRP SRQHQW P D\ ODFN ICQGLYGXDOGLWQFWRQ %/ 0 F 7 KHUHKDG EHHQ URDGV DQG GUOOSDGV DQG FRP P XQIFDWRQVVLWWVHWWEOWKHG Z LWKICQ WKHDUHDGHICHG DVWKH0 RXQW7 HQDER : KIWW&OIIV 3&5 , SURUWX WKH%/ 0 VGHWWP ICDWRQ RI HDJIEICDW IRUWKH1 5 + 3

+ RUVH&DQ RQ IVHDJIEOHIRUICFXVIRQ XQGHUFUWMUQ E DWRFIDWRQ Z LWKSHRSOHWKDWKDYH P DGHDVJ QIIFDQW¶FRQWEXWRQ WX EURDG SDWWMQVRI KIWRU DQG FUWMUQ F IWVVUHSUHHQWDWYH RI DVJ QIIFDQWDQG GLWQJ XLVKDEOHHQWW Z KRVHFRP SRQHQW P D\ ODFN ICQGLYGXDOGLWQFWRQ %/ 0 F 7 KHUHKDG EHHQ URDGVDQG GUOOSDGVHWWEOWKHG Z LWKICQ WKHDUHDGHICHG DVWKH + RUVH&DQ RQ3&5 , SURUWX WKHICFXVIRQ RI WKHVIWRQ WKH1 5 + 3 IQ $ VP DOOSRUWRQ RI WKHRSHQSIWDQG Z DWWURFN GLVSRVDOIDFIDW IRUWKH6 RXW6 IDFIIHG3 IWSHUP IWWG XQGHUWKH + RUVH&DQ RQ0 ICH3 ODQ RI 2 SHUDWRQV1 9 1 Z HUHFRQWXXFWG Z LWKICQ WKHDUHDGHICHG DVWKH+ RUVH&DQ RQ3&5 , SURUWX WKHICFXVIRQ RI WKHVIWRQ WKH1 5 + 3 IQ

(QYLURQP HQWDO&RQVHTXHQFHV&XOXUDO5 HVRXUFHV

3 URSRVHG $ FWRQ

7 KHDFWXYLWLHVDVVRFLDWHG Z LWK WKHH[LVWLQJ DFUHVRI VXUDFHGLVXUEDQFHRFFXUUHG XQGHUWKH FXUUHQWSSOLFDQWFRP P LWWG(30 VOXWG LQ 6HFWRQ 3 UHGLVXUEDQFHFXOXUDO ILQYHQWRUHVZ HUHFRQGXFWG DQG FXOXUDOUHVRXUFHVZ HUHDYRLGHG %\ ILQFRUSRUDWLQJ WKHVH P HDXUHV WKHUHZ HUHQR IP SDFWWR VJ QLIFDQWFXOXUDOUHVRXUFHV

7 KH3URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUDFHGLVXUEDQFHZ RXOG EHFRQGXFWG XQGHUDGKHUHQFHWR WKHFXUUHQWSURWFWRQ P HDXUHVGHWOWG ILQ 6HFWRQ %\ ILQFRUSRUDWLQJ WKHVHP HDXUHV IP SDFWWR VJ QLIFDQWFXOXUDOUHVRXUFHVDUHQRWDQWFLSDWG

,P SOP HQWDWRQ RI WKH(30 WR IP SURYHJ UHDWUVDJ HJ URXVHKDEWWWKURXJ K WKHUP RYDORI HQFURDFKLQJ SLQ RQ NXLSHUWDQGVZ RXOG QRWDHXOWQ VXUDFHGLVXUEDQFH 7 UHDW HQWZ RXOG EH GRQHE\ KDQG

1 R$ FWRQ

7 KHFXUUHQWXUDFHGLVXUEDQFHRI DFUHVRFFXUUHG IRORZ ILQJ WKHDSSOLFDQWFRP P LWWG(30 V OXWG LQ 6HFWRQ 3 UHGLVXUEDQFHFXOXUDOILQYHQWRUHVZ HUHFRQGXFWG 8 QGHUWKH1 R $ FWRQ$ OWOQDWYH H[SORUDWRQ Z RXOG RQ) RFFXUIQ RSHQ DQG DFWYHDUHDV 1 R QHZ GLVXUEDQFH Z RXOG EHDORZ HG %\ ILQFRUSRUDWLQJ WKHSURWFWRQ P HDXUHVGHWOWG ILQ 6HFWRQ VJ QLIFDQWP SDFWWR FXOXUDOUHVRXUFHVZ RXOG QRWRFFXU

&XP XODWYH(IIHFW

3 UHGLVXUEDQFHFXOXUDOILQYHQWRUHVKDYHEHHQ FRQGXFWG DQG FXOXUDOUHVRXUFHVKDYHEHHQ DQG Z RXOG EHDYRLGHG %\ ILQFRUSRUDWLQJ WKHSURWFWRQ P HDXUHVGHWOWG ILQ 6HFWRQ VJ QLIFDQWFXP XODWYHIP SDFWWR FXOXUDOUHVRXUFHVKDYHQRWRFFXUHG DQG DUHQRWDQWFLSDWG

1 DWYH$ P HUIFDQ &XOXUDO&RQFHUQV

) HGHUDOODZ DQG DJHQF\ J XLGDQFHUHTXLUH%/ 0 WR FRQVXOWZ LWK 1 DWYH$ P HUIFDQ WUEHV FRQFHUQLQJ WKHIGHQWLIDWRQ RI FXOXUDOYDXHVDQG WDGLWRQDOSUDFWFHVRI 1 DWYH$ P HUIFDQ SHRSOHWKDWP D\ EHDIIHFWG E\ DFWRQVRQ%/ 0 DGP ILQLWWUHG ODQGV 7 KLVFRQVXOWWRQ ILQFOXGHV WKHIGHQWLIDWRQ RI SODFHV LH SK\ VLFDORRFDWRQV RI WDGLWRQDOFXOXUDOIP SRUWQFHWR 1 DWYH $ P HUIFDQ WUEHV 3 OFHVWKDWP D\ EHRI WDGLWRQDOFXOXUDOIP SRUWQFHWR 1 DWYH$ P HUIFDQ SHRSOHILQFOXGH EXWDUHQRWOP LWG WR ORFDWRQVDVRFLDWG Z LWK WKHWDGLWRQDOEHDHV FRQFHUQLQJ WUEDORUJ ILQV FXOXUDOKLWRU RUWKHQDXUHRI WKHZ RUOG ORFDWRQVZ KHUHUHDJ IRXV SUDFWWRQHVJ R HWKHUIQ WKHSDWRUWKHSUHVHQWWR SHUIRUP FHUP RQLDOFWYLWHVEDVHG RQ WDGLWRQDOFXOXUDOUXOHVRUSUDFWFH DQFHWDOKLEWWRQ VLWV WDLOV EXUDOWV DQG SOFHV IURP Z KIFK SODQV DQP DOV P ILQHUDOV DQG Z DWLVSRVHWLQJ KHDQQ SRZ HVRUXVHG IRURWHU VXEVLWWQFHSXL$RVHV P D\ EHWNHQ 6RP HRI WKHVHORFDWRQVP D\ EHFRQVLGHUHG VLFUHG WR SDUWFXDU1 DWYH$ P HUIFDQ IQGLYLGXDOVRUWUEHV

%/ 0 KDVEHHQ HQJ DJHG ILQ 1 DWYH$ P HUIFDQ FRQVXOWDWRQ UHJ DUGLQJ H[SORUDWRQ DFWYLWHVILQ WKH + & &8 (3 DUHD VLFHWKHILQWDO+ & &8 (3 3OQ Z DVSURSRVHG ILQ FRQVXOWDWRQ LVRQJ RLQJ ,QFRP SOLDQFHZ LWK WKH1 + 3$ DVDP HQGHG WKH%/ 0 ILQWDWG 1 + 3$ DQG JRYHUQP HQWWR

JRYHUQP HQWFRQVXOWDWRQ IRUWKH+&&8(3 3QDQ0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQW($
RQ2 FWREHU E\ VHQGLQJ OHWWHUV WR WKH IRORZ LQJ WUDGJURXSV %DWWH0 RXQWDLQ %DQG RI
WKH7 H0 RDN7 UEHRI: HVWDLQ6KRVKRQH ' XFNZ DWU6KRVKRQH7 UEH (ONR %DQG RI WKH7 H
0 RDN7 UEHRI: HVWDLQ6KRVKRQH 7 H0 RDN7 UEHRI: HVWDLQ6KRVKRQH DQG< RP ED6KRVKRQH
7 UEH 7 KHFRQVXOWDWRQ IRUWKH+&&8(3 3QDQ0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQW($
LVRQJRLQJ

$ IIHFWHG (QYLURQP HQW DWWHH$ P HUIFDQ &XOWXUDO&RQFHUQV

7 KHSRWHQWDOLP SDFWVIURP P LQLQJ DQG H[SORUDWRQ LQ WKH&RUW] 0 RXQWDLQVKDYHEHHQ
H[WHQVLYHO DQDO]HG LQ WKH&RUW] +LOOV) (,6 %/0 F 7 KH1 DWLYH$ P HUIFDQ WUDGLWRQDO
YDOXHVUHJ LRQDOFXP XODWLYHHHIHFWVWXG\ DUHDDQDO]HG LQ WKH&RUW] +LOOV) (,6 LQFOXGHG WKH
+&&8(3 3QDQ DUHD WKDWDQDO]VLVLVLQFRU$RUDWHG E\ UHHUHQFH

(QYLURQP HQWO&RQVHTXHQFHV1 DWLYH$ P HUIFDQ &XOWXUDO&RQFHUQV

3URSRVHG $ FWRQ

7 KHUHZ DVDQ LQFLGHQWRI QRQFRP SOLDQFHZ LWK WKHDSSOLFDQWFRP P LWWG(30 VFRQFHUQLQJ WKH
0 RXQW7 HQDER: KLWH&OLIV3&5, %DUUFN KDG FRQWWXFWHG DQHZ SDG DQG LQWWOOHG D
FRP P XQLFDWRQ IDFLOW QHDUWKHORFDWRQ RI DQH[LWWQJ UDGIR UHSHDWUWR HURQ WKHWS RI 0 RXQW
7 HQDER %DUUFN GLG QRVSURYLGHSURUQRWFHWR %/0 RI WKHDFWWLW DQG WKHSDG FRQWWXFWRQ
RFFXUUHG ZLWRXWD %/0 TXDOLIHG DUFKHRORJLWDQG1 DWLYH$ P HUIFDQ REVHUYHURQ VLWHGXUQJ WKH
QHZ VXUDFHGLWXUEDQFH %/0 LWXHG D1 RWFHRI 1 RQFRP SOLDQFH2 UGHUWR %DUUFN GDWG
6HSWP EHU FRQFHUQLQJ WKHSDG FRQWXFWRQ %DUUFN KDVUHP RYHG WKHFRP P XQLFDWRQ
IDFLOW DQG VXEP LWWG DJ UDGLQJ DQG UHOOP DWRQ SOLDQ Z KLFK KDVEHQ DSSURYHG E\ WKH%/0
7 KLV1 RWFHRI 1 RQFRP SOLDQFH2 UGHUZ DVOLWG E\ WKH%/0 OHWWUGDWG0 DUFK

([SORUDWRQ DFWLWLHVDWRFLDWG ZLWK WKHH[LWWQJ DFUHVRI VXUDFHGLWXUEDQFHKDYH
IP SDFWG WKH0 RXQW7 HQDER: KLWH&OLIV3&5, %DUUFN KDVUHP RYHG WKHFRP P LWWG(30 V 6HFWRQ
KDYHP LQIP I]HG HIHFWV WR WKHHOPP HQW WKDWFRQWWEXWWR WKHFXOWXUDOFKDUDFWWUWWFVRI
WKH0 RXQW7 HQDER: KLWH&OLIV3&5, DQG WKH+RUVH&DQ RQ3&5,

7 KH3URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUDFHGLWXUEDQFHP D\ UHXXOWQ IXXUH
H[SORUDWRQ DFWLWLHVZ LWLQ WKH0 RXQW7 HQDER: KLWH&OLIV3&5, DQG WKH+RUVH&DQ RQ3&5,
7 KHDSSOLFDQWFRP P LWWG(30 V 6HFWRQ Z RXOG UHP LQIQ HIHFWXQGHUWKH3URSRVHG
$ FWRQ $ FFHVV WR WKHWHDUHVZ RXOG QRWHUHWWUFWG %\ LQFRUSRUDWQJ WKHWHP HDXUHV
SRWWQWDOHIHFWV WR WKHHOPP HQW WKDWFRQWEXWWR WKHFXOWXUDOFKDUDFWWUWWFVRI WKH0 RXQW
7 HQDER: KLWH&OLIV3&5, DQG WKH+RUVH&DQ RQ3&5, Z RXOG EHP IQIP I]HG DQG QR VLJ QLIFDQW
IP SDFWUHDWWHWX1 DWLYH$ P HUIFDQ FXOXUDOFRQFHQVDUHDQWFLSDWG

,P SOPP HQWDWRQ RI WKH(30 WX IP SURYHJ UHDWUVDJ HJ URXVHKDEWWWKURXJ K WKHWWHDW HQWRI
HQFURDFKQJ SLQ RQ MXQLSHUWWQGVZ RXOG QRWUHXOWQ VXUDFHGLWXUEDQFH 7 UHDW HQWUHP RYDO
Z RXOG EHGRQHE\ KDQG: LWK WKHIP SOPP HQWDWRQ RI (30 VRXWQHGLQ6HFWRQ QR
VLJ QLIFDQWP SDFWWX WKHHOPP HQW WKDWFRQWEXWWR WKHFXOWXUDOFKDUDFWWUWWFVRI WKH3&5,
DUHDVDUHDQWFLSDWG

1 R$ FWRQ

7 KHDSSOLFDQWFRP P LWWG (30 VZ RXOG UHP DLQ LQ HIIHFWXQGHUWKH1 R$ FWRQ$ OWLQDWLYH ([SORUDWRQ DQG UHOD P DWRQZ RXOG RFFXULQ RSHQ DQG DFWLYHDUHDVRQ\ 3RWQWDOOLUFWHIIHFW WR WKH0 RXQW7 HQDER: KLWL&OLIV3&5 , Z RXOG EHDYRLGHG 7 KHDSSOLFDQWFRP P LWWG (30 V 6HFWRQ Z RXOG UHP DLQ LQ HIIHFWXQGHUWKH1 R$ FWRQ$ OWLQDWLYH %\ LQFRUSRUDWLQJ WKHVHP HDXUHV SRWQWDOHIIHFWV WR WKHHOOP HQVWKDWFRQWLEXWWR WKHFXOXUDOFKDUDFWLUWFVRI WKH0 RXQW7 HQDER: KLWL&OLIV3&5 , DQG WKH+ RUVH&DQ RQ3&5 , Z RXOG EHP LQIP L]HG DQG QR VLJ QLIIFDQWP SDFWUHDWWHWR1 DWYH$ P HUFDQ FXOXUDOFRQFHQVDUHDQWFLSDWG

&XP XODWLYH(IIHFW

7 KH1 DWYH$ P HUFDQ WDGLWRQDOYDXHVUHJ IRQDOFXP XODWLYHHIIHFWVWXG\ DUHDDQD\]HG LQ WKH &RUW] + LOY) (,6 LQFXGHG WKH+ & &8 (3 3DQ DUHD WKDWDQD\VLVLVLQFRUSRUDWHG E\ UHHUHQFH %/ 0 F : LWLQ WKHUHJ IRQDOFXP XODWLYHHIIHFWVWXG\ DUHD FXP XODWLYHIP SDFWKDYH RFFXUUHG Z LWLQ: HWWLQ6KRVKRQHDERUJ LQDOOOQGVWKDWKDYHSURYLGHG DQG FRQWQXHWR SURYLGH VXVWDLQDFH DVZ HOODV VSLUWXDOOQG UHDJ IRXVUHQHZ DO IRUWKHLQGLJ HQRXVSHRSOH 1 DWYH $ P HUFDQVEHOHYH WKHSRZ HUWKDWP DQDWVIURP WKHOOQG Z DWU SOODQV DQG DQP DVIXHVWKHU FXOXUDOLGHQWW DQG KHUWJ H 0 LQLQJ UHDWG DFWYLWHV FDWWHJ UL]LQJ FRQWXFWRQ RI WDQP LWWRQOLQHV Z LOGLUHV WDQVSRUWWRQ FRUUGRUV DQG RWKHUDFWRQVLQ WKHUHJ IRQDO FXP XODWLYHHIIHFWVWXG\ DUHDFXP XODWLYH\ KDYHDIIHFWG RUZ RXOG DIIHFWWKHVHUHVRXUFHVDQG : HWWLQ6KRVKRQHFXOXUH WDGLWRQ DQG OLHZ D\ V ' ILHFWP SDFWWX SUHKLWRUF DQG HWQRKLWRUF VLWWV DQG EXUDOVDVD UHXOWRI DFWYLWHVDWWRFLDWG Z LWK SDWWSUHVHQWDQG 5)) $ V KDYHEHHQ RUZ RXOG EH P LWJ DWG IQ FRP SOODQFHZ LWKIHGHUDODQG WDWWODZ V + RZ HYHU VRP H : HWWLQ6KRVKRQHEHOHYH WKDWWKHVHIP SDFWFDQQRWEH VDWWLDFWRUL\ P LWJ DWG 7 KHVHDFWRQV KDYHFXP XODWLYH\ IP SDFWG DQG Z RXOG FRQWXHWR IP SDFWWKHUKHUWJ HDQG OLHZ D\ V %/ 0 F

5 RDGV WDQVP LWWRQ OLQHV P IQHVDQG P IQH UHDWG IDFLOWHV DJ UFXOXUH IQ UDWXFWUH DQG KXP DQ VHWWP HQWKDYHFUHDWG FXP XODWLYHYLXDOIP SDFWIQ DOOQGVFDSHWKDWKDVEHHQ SDUWRI WKH: HWWLQ6KRVKRQHDERUJ LQDOOQGVIRUFHQWUHV 6RP HRI WKHOQGP DUNVWDGLWRQ\ XVHG E\ 1 DWYH$ P HUFDQVKDYHEHHQ RUZ RXOG EH YLXDO IP SDFWG E\ GHYHORSP HQWUHDWG DFWYLWHV $ VDUHXOW1 DWYH$ P HUFDQVYIHZ WKHURUJ LQDOXVHDQG VDFUHGQHVVDVKDYQJ EHHQ GHYDOXHG %/ 0 F

' ILHFWP SDFWWX1 DWYH$ P HUFDQ UHDJ IRXVFRQFHQVZ RXOG EHDYRLGHG Z LWK IP SOP HQWWRQ RI WKHDSSOLFDQWFRP P LWWG (30 V) RQOZ IQJ UHFOP DWRQ WKHDUHDZ RXOG EH UHXWLQHG WX DSUH GLVXLEDQFHOOQG XVHFRQGLWRQ

,QVXP P DU VRP H: HWWLQ6KRVKRQHEHOHYH WKDWDUHDVRQFHXQDIIHFWG E\ GHYHORSP HQWDQG HQFRP SDWLQJ WKH3XKDDQG VSLUWRI WKHUDQFHWRUVKDYHEHHQ GIP IQLVKHG 7 KH: HWWLQ 6KRVKRQHDERUJ LQDOOQGVIQ WKHUHJ IRQDOFXP XODWLYHHIIHFWVWXG\ DUHD DQG WKHUHWRXUFHV Z LWLQ KDYHEHHQ RUZ RXOG EH FXP XODWLYH\ DIIHFWG E\ SDWWSUHVHQWDQG UHDWRQDE\ IRUHWHDEOHGHYHORSP HQW%/ 0 F

$ ILU5 HVRXUFHV

7 KLV VHFWRQ GHVFUEHV WKH DLUUHVRXUFHV DQD\ VLV DUHD DQG HIIHFWV WR DLUTXDOW 7 KH DQD\ VLV DUHD IRUSRWQWDO GLUHFWDQG LQGLUHFWP SDFWV WR DLUTXDOW LQFOXGHV WKH + & &8 (3 3DQ ERXQGDU\ 7 KHFXP XODWYH DQD\ VLV FRQVLGHUV WKH DLUVKHG DWRFIDWG Z LWK WKH WKUHHK\ GURJ UDSKIF DUHDV &UHVFHQW9 DOOH\ * UDW9 DOOH\ DQG 3LQH9 DOOH\

+ & &8 (3 DFWYLWLHV WKDW Z RXOG UHVXOW LQ DLUHP LVVLRQV LQFOXGH VXUDFHGLVXUEDQFH DWRFIDWG Z LWK H[SORUDWRQ GULOOQJ DFWYLWLHV YHKLFOH DQG HTXLSP HQW WDYHO UHODP DWRQ Z RUN DQG XVHRI GLHVHOSRZ HUHG HTXLSP HQW6 RXUFHV RI DLUHP LVVLRQV DWRFIDWG Z LWK WKH H[SORUDWRQ DFWYLWLHV ILQFOXGH GLHVHOH[KDXWDQG JURXQG GLVXUEDQFH DFWYLWLHV ILQFOXGLQJ URDG FRQVWXFWRQ P DLQWHQDQFH DQG YHKLFOH WUDIIF IXJLWYHGXW

&RP SDUROVEHWZ HHQ DP EIHQWDLUTXDOW DQG QDWRQDODQG VWDW$ P EIHQV$ ILU4 XDOW 6 WXQGDUGV $ $ 4 6 DUHXVHG WR DVHVV DLUTXDOW **7 DEOH** ILQFOXGHVQDWRQDODQG1 HYDGD$ $ 4 6

7 DEOH 1 DWRQDODQG6 WDWHRI 1 HYDGD$ P EIHQV$ ILU4 XDOW 6 WXQGDUGV

3 RQOXWDQW	$ YHUDJLQJ 7 IP H	1 HYDGD 6 WXQGDUGV &RQFHQWUDWRQ 3 J P	1 DWRQDO6 WXQGDUGV 3 UP DU\ 3 J P	6 HFRQGDU\ 3 J P
2]RQH	KRXU		1 $	1 $
	KRXU			
&DUERQP RQR[LGH &2	KRXU			
&2 OHVVWKDQ IHHW DERYH P HDQVHOHYHO DP VO	KRXU			
&2 DWRUJ UHDWHUWKDQ IHHWP VO	KRXU			
6XOXUGR[LGH 62	KRXU	1 $		1 RQH
	KRXU		1 RQH	
	KRXU			1 RQH
	$ QQXDODYHUDJH			1 RQH
1 LWURJHQGR[LGH 1 2	KRXU			1 RQH
	$ QQXDODYHUDJH			
3DUWFXODWH0 DWWHU 30	KRXU			
	$ QQXDODYHUDJH		1 $	1 $
30	KRXU			

7 DEOH 1 DWRQDOODQG 6 WDWHRI 1 HYDGD $ P EIHQW$ ILU4 XDOLW 6 WDQGDUGV

3 RQWDQW	$ YHUDJLQJ 7 IP H	1 HYDGD 6 WDQGDUGV &RQFHQWUDWRQ 3 J P	1 DWRQDO6 WDQGDUGV 3 UP DU\ 3 J P	6 HFRQGDU\ 3 J P
	$ QQXDODYHUDJH			
/ HDG	5 RODQ P RQWK DYHUDJH			
	4 XDUWHUO DUWHP HWF P HDQ			
+ \ GURJ HQ VXOILGH	KRXU			

J P ± P IFURJUDP VSHUFXEIF P HWU

6RXUFH 1 $ & % 6WDQGDUGVRI 4 XDOLW IRU$ P EIHQW$ ILU 1 5 6 % % 8 6(3$

) / 30 $ SURYLGHV%/ 0 ¶VEDVIF DXWKRULW DVDP XDOSOHXVHODQG P DQDJ HP HQWDJ HQF\ ) / 30 $ DOVR SODFHVWKHUHVSRQVLEOLW RQ%/ 0 WR SURYLGHIRUFRP SOLDQFHZ LWK DSSOLFDEOHWDWH DQG IHGHUDOSRODXWRQ FRQWRODZ V DLU Z DWU QRLVH DQG RWKHUSRODXWRQ WDQGDUGV XQGHU%/ 0 ODQG XVHSODQV DQG WR WDNHDFWRQVQHFHVDU WR SUHYHQWXQHFHVDU RUXQGXHGHJUDGDWRQ RI WKH SXEOIF ODQGV

7 KH%/ 0 0 DQXDO SURYLGHVGLUHFWRQ IRUDLUHRXUFHP DQDJ HP HQWXQGHUWKH%/ 0 DGP LQLWDWRQ 7 KHFXUHQ6 KRVKRQH(XUHND5 0 3 %/ 0 D GRHVQRWSURYLGHIXUWKHU P DQDJ HP HQW XLGDQFHRQ DLUTXDOW SHUP LWVDQG SURYLGHVWKHRYHUJ KWRUFRP SOLDQFHZ LWK WKHSHUP LWDVSUHFUIEHG LQ WKH1 $ & %UHJ XODWRQV 7 KH6 WDWHRI 1 HYDGD XVHVWKHIHGHUDO KD]DUGRXVDLUSRODXWQW+ $ 3 OWWRUHP LWRQ WDQGDUGV

$ IIHFWHG(QYLURQP HQW$ ILU5 HVRXUFHV

&OP DWHDQG 0 HWHRURORJ

7 KHSURMHFWDUHDLVORFDWHG DWWKHVRXWKHUQ HQG RI WKH&RUW] 0 RXQWDLQV 7 KHHDYDWRQVZ LWKLQ WKHSURMHFWDUHDUDQJ HIURP IHHWDERYHP HDQ VHDOHYHO DP VO WR IHHWP VO $ FFRUGLQJ WR WKH: HWHUQ5 HJ IRQDO&OP DW&HQWU : 5 && WKHDYHUDJ HP DJ IP XP WP SHUDXUHDWKH%HRZ DZ H8 QLYHUVLW RI 1 HYDGD5 DQFK ORFDWHG DSSUR[IP DWO P IOHV VRXWK RI WKHSURMHFWDUHD LVDSSUR[IP DWO GHJ UHHV) DKUHQKHLW) IQ-XO DQG WKHDYHUDJ H P IQIP XP WP SHUDXUHLVDSSUR[IP DWO) IQ-DQXDU 7 KHDYHUDJ HDQQXDOSUHFLSLWDWRQ LV DSSUR[IP DWO IQFKHVDQG WDQGVWR SHDNIQ0 D : 5 && *Current Conditions*

7 KH%/ 0 SXEOXKHG WKHIIQDO5 DSIG(FRUHJ IRQDO$ VWHWP HQW5 ($ IRUWKH&HQWDO%DVQ DQG 5 DQJ HIQ-XQH &RP HUHWDO 5 ($ VH[DP IQHFOP DWFKDQJ HDQG RWKHUZ IGHVSUHDG

HQYLURQP HQWDOLQIOXHQFHV WKDWDUH DIIHFWHQ Z HWWLQ QDQGVFDSHV 5 ($ VORRN DFURVDQ HFRUHJIRQ WR P RUHIXOO XQGHUWDQG HFRORJLFDOFRQGLWRQVDQG WHQGV QDWXUDOOQG KXP DQ IQIOXHQFHV DQG RSSRUWXQLWHV IRUUHVRXUFHFRQVHUYDWRQ UHVRUDWRQ DQG GHYHORSP HQW7 KH5 ($ VURYLGH UHJIRQDOIQIRUP DWRQ WKDWFDQ IQIRUP GRFDOP DQDJ HP HQWHIRUW

2 YHUWKHSDWW \ HDUV WKHZ HDWKHU YHJ HWDWRQ FRYHU DQG Z IOGLIUHUHJIP HVRI WKH&HQWDO %DVLQ DQG 5 DQJ HHFRUHJIRQ KDYHFKDQJ HG VXJ J HWQJ DFKDQJ HIQ WKHHFRUHJIRQ¶VFOP DW UHJIP H &KDQJ HVIQ WP SHUDXUHDQG SUHFLSLWDWRQ KDYH UHXXOWHG IQ FKDQJ HV WR YHJ HWDWRQ FRYHU DQG Z IOGLIUHUHJIP HV &KDQJ HV DUH[SUHXHG IQ VSHFLHVFRP SRVLWRQ FKDQJ HVIQ YHJ HWDWRQ FRP P XQLWHV DQG IQFUHDVIQ TXDQWWHVRI IQYDVLYH VSHFLHV 0 DQ\ DUHDVRQFHGRP IQDWHG E\ VDJHEUXVK KDYHSIQ RQ MXQLSHUHQFURDFKP HQWDVZ H0DVGRZ Q\ EURP H FKHDWUDW

Greenhouse Gas Emissions

* UHQKRXVHJ DVHV * + * V DUHWKRVHWKDWWRRZ VKRUWZ DYHVRDUUDGLDWRQ WR HQWUWKHHDUW¶V DW RVSKHUHEXWZEVRUE ORQJ Z DYHIQ UDUHG UDGLDWRQ UHP IWWG IURP WKHHDUW¶V VXUIFH * + * V FDQ DIIHFWFOP DWSDWWLQV Z KIFK IQ WXQ FDQ DIIHFWUHRXUFHP DQDJ HP HQW

* DVHVH[KIEIWQJ J UHQKRXVHSURSHUWHVFRP HIURP ERWK QDWXUDODQG KXP DQ VRXUFHV : DWU YDSRU FDUERQ GIR[IGH P HWDQH DQG QIWRXVR[IGH DUHH[DP SOHVRI * + * VWKDWKDYHERWK QDWXUDO DQG P DQ P DGH VRXUFHV Z KIOHIRWHU* + * V VXFK DV FKORURIOXRURFDUERQV DUHH[FOXVLYH) P DQ P DGH

6 RXUFHVRI * + * HP IWWRQVIQ WKHYIFIQIW RI WKHSURMFWDUHD DUHZ IOGIUHVDQG SUHMFUEHG EXIQV YHKIFOHV IQFOXGIQJ RII KIJ KZ D\ YHKIFOHV 2 + 9 V FRQWXFWRQ DQG RSHUDWRQ IRUP IQHUDDQG HQHJ\ GHYHORSP HQWDQG J UD]IQJ OYHWRFN Z IOG KRUVHV DQG EXUURV 7 R WKHH[WQWWKDWWKHVH DFWXYIWHVIQFUHDVH * + * HP IWWRQVDUHDOYR OINHO) WR IQFUHDVH

Climate Change

&OP DWUHSUHVHQVWKHORQJ WHUP WWDXWFDOFKDUDFWHU] DWRQ RI GIO\) VHDVRQDO DQG DQQXDO Z HDWKHUFRQGIWRQV VXFK DV WP SHUDXUH UHDXYHKXP IGIW SUHFLSLWDWRQ FORXG FRYHU VRDU UDGLDWRQ DQG Z IQG VSHHG DQG GIUHFWRQ &OP DWIV WKHFRP SRVWRI J HQHUDO) SUHYDIQIQJ Z HDWKHUFRQGIWRQVRI DSDUWFXDUUHJIRQ WKURXJ KRXWWKH\ HDU DYHUDJ HG RYHUD VHUHHVRI \ HDUV $ UHJIRQ¶VFOP DWIV DIIHFWWG E\ OXWXGH WWUDIQ DQG DOWXGH DVZ H0DVQHDE\ Z DWUERGHVDQG WKHUFXUHQW

: DUP HUDQG P RUHDUG FRQGIWRQV FRXSOHG Z IWK DVKRUWUVQRZ VHDVRQ KDYHOHG WR OP IWG Z DWUVXSSOHVDQG VHYHUHGURXJ KWQ SDUWRI WKH WDWM %\ WKHDYHUDJ HWP SHUDXUHIQ 1 HYDGDIVSUHGIFWG WR IQFUHDVHE\ WKUHHWR IRXU) IQ WKH VUIQJ DQG IDOODQG E\ IIYHWR VI[ ) IQ WKH VXP P HUDQG Z IQWU (O1 IxR HYHQWDUHSUHGIFWG WR IQFUHDVHIQ IUHTXHQF\ DQG GXUDWRQ DVD UHVXOWRI J OREDOFOP DWFKDQJ H 7 KHVHWP SHUDXUHFKDQJ HVZ RXOG DIIHFWHYDSRUDWRQ DQG SUHFLSLWDWRQ IQ WKH WDWM OINHO) UHXOWQJ IQ WKH GHFUHDVHG DYDIODEIOW RI Z DWU 1 DWRQDO &RQIHUHQFHRI 6 WDWM/ HJ IVODXUHV

,Q WKH&HQWDO%DVLQ DQG 5 DQJ HHFRUHJIRQ FOP DWP RGHOVVXJ J HWWKHUHIVQR WWRQJ WHQG WRZ DIG HIWKHUZ HWWURUGUHUFRQGIWRQVHIWKHUIQ WKHQHDUXXUH WKURXJ K WKH V RUIQ WKH

ORQJ WHUP WKURXJK WKH V &RP HUHWDO + RZ HYHU P RGHOV VKRZ VLJ QLIIFDQWOQFUHDVHV
LQ P DJ IP XP P RQWKO WKP SHUDXUHVE\ SUP DUO LQ WKH VXP P HUP RQWKV - XO $ XJ XW
DQG 6HSWP EHU 7 KHKLJ KHWP DJ IP XP WP SHUDXUHLQFUHDVHSURWHFWG LVVI[ ) 7 KHVH
LQFUHDVHV DUHSUHGLFWG WR RFFXUP RWW LQ WKH VRXWKHQ DQG QRUWKDWWLQ HGJ HVRI WKHHFRUHJ IRQ
) RUHFDWWIRU SUHGLFWXEWWQWDOLQFUHDVHVLQ P DJ IP XP WP SHUDXUHIRUDOOP RQWKV 6IP LODU
WR IRUHFDWWIRU WKHJ UHDWWWLQFUHDVHV DUHSUHGLFWG GXULQ WKH VXP P HUP RQWKVDQG DORQJ
WKH VRXWKHQ DQG QRUWKDWWLQ HGJ HVRI WKHHFRUHJ IRQ &RP HUHWDO 0 RGHOIRUHFDWWIRU
P IQIP XP WP SHUDXUHV VKRZ DFRQVLGHUDEOHFKDQJ HLQ ERWK UDWDQG P DJ QLWXGHRYHUP RWWRI WKH
WXG\ DUHD - XO WKURXJ K 6HSWP EHUVKRZ HG WKHJ UHDWWWGHJ UHHRI FKDQJ HRYHUP RWWRI WKH
UHJ IRQ

' DWWIRUSUHFLSLWDWRQ VXJ J HWWQR WWRQJ WHQG WXZ DUG HLWHUZ HWWURUGUHUFRQGLWRQVIQ DQ\
P RQWKIRUWKHHFRUHJ IRQ : LWK WKHH[FHSWRQ RI D VDJ KWQFUHDVHIQ VXP P HUP RQWRQ UDQV
WXZ DUG WKH VRXWKDQG HDWWWKHUZ HUHQR VJ QLIIFDQWRUHFDWWG WHQGVIQ SUHFLSLWDWRQ IRUDQ\
RWKHUP RQWKVIQ HLWKHUWKHQHDUWWUP V RUP IGFHQXU V SURWFWRQV &RP HUHW
DO

3 RWQWDOHIHFWRI WKHWHIRUHFDWWRQ WKHODQGVFDSHFRXOG IQFOXGHIQFUHDVHG IXHORRDGVIQ
KJ KHUHOHYDWRQV IQFUHDVHG IUHTXHQF\ DQG GXUDWRQ RI GURXJ KW H[SDQWRQ RI IQYDWLYH
VSHFIHVIQ KJ KHUHOHYDWRQV IQFUHDVHG ZIQG HURVIRQ DQG FKDQJ HVIQ ZIQGIUHUHJIP HV &RP HU
HWDO + RZ HYHU WKHSRWQWDOHIHFWRI WKHSURWFWRQ FOP DWFKDQJ HDUHEH\ RQG WKH
VFRSHRI WKLV($ DQG DUHQRWXUWKHUDQDO] HG IQ WKLV($

7 KH1 ' (3 %$ 3& GRHVQRWFXUUHQW P RQLWRUDP EIHQWLUTXDOW IQ WKH+ & &8 (3 DUHD WKHDUHD
LVWKHUHRUHFRQGHUHG XQFDWWIIHG IRUDOOSRQXWQWKDYIQ DQ DUTXDOW WWQGUG &) 5
+ RZ HYHU WKHDUTXDOW IQ WKH+ & &8 (3 UHJ IRQ IVFRQGHUHG WWSIFDOIRUXQGHYHOPSHG
UHJ IRQVRI WKHZ HVWWQ8 6) RUUHJ XDWRU DQG SOQQIQJ SXUSRVHV + & &8 (3 IVFRQGHUHG WR
EHIQ DQ DWWQP HQWXQFOWIIHG DUHD P HDQIQJ IWP HHWDUTXDOW WWQGUG

%DUUIFN RSHUDWWWKHFXUUHQW+ & &8 (3 3OQ DFWYIWHVXQGHUD&OW,, $ IL4 XDOW 2 SHUDWQJ
3HUP IW$ 3 OWWDXWRU] HG E\ WKH1 ' (3 %$ 3& IQ) HEUXU\ 1 ' (3 E
7 KH&OW,, SHUP IWVIRUIDFIOWHVWKDWP IWOHWVWKDQ WRQVSHU\ HDUIRUDQ\ RQHUHJ XOWWG
SRQXWQWDQG HP IWOHWVWKDQ WRQVSHU\ HDUWRWO+ $ 3 DQG HP IWOHWVWKDQ WRQVSHU\ HDUI
DQ\ RQH+ $ 3 8 QGHUWKH&OW,, $ IL3 HUP IW%DUUIFN VXEP IW\ HDU\ UHSRUWWR WKH1 ' (3 %$ 3&
WR GRFXP HQWDOOHP IWIRQVXQIWV\ WWP V\SHFIIIHG

%DUUIFN FRQGXFWWG DQ HP IWIRQVIQYHQWRU\ IRUWKH&OW,, $ IL4 XDOW 2 SHUDWQJ 3HUP IW
%DUUIFN G 7 KHIQYHQWRU\ IQFXGHG WXR H[IWWQJ GHWHOJ HQHUDWRUV WXR HP HJ HQF\ GHWHO
J HQHUDWRUV DQG D J DOWRQ J DVRIQHI XHDQJ WWQN 7 KHI DFIOW Z IGH VWWWRQDU\ VRXUFH
SRWQWDOWWKHP IWYDXHVDUH VKRZ QIQ **7 DEOH**

7 DEOH $ FWYIW (P IWIRQV 6XP P DU

3 RQXWQW	**3 RXQGV + RXU**	**7 RQV < HDU**
30		

7 DEOH $ FWXDOH (P LVLRQV6 XP P DU

3 RQOXVRQV	**3 RXQGV + RXU**	**7 RQV< HDU**
30		
30		
1 LWRJ HQ R[LGHV 1 2 [		
62		
&2		
9 RODWLOHRU DQLF FRP SRXQG 9 2 &		
+ $ 3 V		
%HQ]HQH	(	(
7 RXHQH	(	(
; \OHQH	(	(
) RUP DOGHK\ GH	(	(
$ FHWDOGHK\ GH	(	(
$ FURORHLQ	(	(
1 DSK\WKDOHQH	(	(

6RXUFH %DUUFN G

) XJ XWXUH' XW0 DQDJHP HQW

$ GGH[SORUDWRQ DFWXLWLHV Z LWK VXUFHGLWXUEDQFHH[FHHGLQJ DFUHVDUHUHTXLUHG WR REWDLQ D VXUFHDUHD GLWXUEDQFH 6$ ' SHUP LWUURP WKH1 ' (3 %$ 3& %DUUFN KDVLQWXXXG IXJ XWXUH GXWFRQWROOP HDXXUHVDVSHUWKH+ & &8 (3 IXJ LWXHGXWFRQWROSODQ IQ WKH6$ ' XQGHU1 $ & % 7 KH+ & &8 (3 IXJ LWXHGXWFRQWROSODQ LVIP SOHP HQWG XQGHUWKH$ ILU4 XDOOW 2 SHUDWQJ 3HUP LW%0 3 VWR SUHYHQWSDLWFXOWP DWWU 30 IURP EHFRP IQJ DLUERUQHIQFXGH VSHHG OP LWSRWWG DQG YHKLFOHVSHHGVUHGXFHG IQ DUHDVRI GLWXUEDQFHWR P IQIP I]HWKHSRWQWDO IRUIXJ LWXHGXWFP LWLRQV SURWFWZ IQ0DIHDQG OYHWRFN DQG P DIQWQ RSHUDWRQDOVJHW VSHHG OP LWHQIRUFHG DFFHWDQG GUIOURDGVP DIQWQHG DQG Z DWUHG Z HWGUIOQJ P HWRGVDUH XVHG %DUUFN UHTXLUHVWKDWYHKLFOHVDUHP DIQWQHG UHJ XDUO WR HQVXUHWKH DUHRSHUDWQJ IQ D P DQQHUWR P IQIP I]HYHKLFOHHP LWLRQV 1 ' (3 E

(QYLURQP HQWO&RQVHTXHQFHV$ ILU5 HWRXUFHV

3 URSRVHG $ FWRQ

7 KHDFWXLWHVDWRFIDWG Z LWK WKHH[LWQJ DFUHVRI VXUFHGLWXUEDQFHZ HUHFRQGXFWG XQGHUWKH&ODW,, SHUP LWVXXHG E\ 1 ' (3 %DUUFN IQWXXXWG WKHI XJ LWXHGXWFRQWROSODQ WR P IQIP I]HGXWFP LWLRQVIURP URDGV GUIOSDGV DQG RWKHUDUHDV 6SHGOP LWZ HUHSRWWG DQG

HQIRUFHG WR UHGXFH IXJLWLYH GXW WURP YHKLFXODU WUDIIF WKH DFFHVV URDGV DQG GULOOURDGV ZHUH ZDWHG : HWGULOOP HWRGVZ HUH XVHG ZKLFK P LQLP L]HG GXW WP LWLRQV IURP GULOOLQJ DFWLYLWLHV %DUUFN KDVUHFRQRXUHG DQG VHGHG DFUHV RI VXUDFHGLWXUEDQFHZ KLFK UHGXFHV WKH SRWHQWDO IRUZ LQGEORZ QGXW WURP H[SRVHG VXUDFHV 7 KHDSSOLFDQWFRP P LWWG(30 VDQG DGKHUHQFH WR WKH UHTXLUP HQWLQ WKH&ODW,, SHUP LWKDYHP LQLP L]HG WKHHIHFW WR DLUTXDOW

7 KH3URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVZ RXOG LQFUHDVH WKH VXUDFHGLWXUEDQFH WR DFUHV 7 KHP D[IP XP QXP EHUR GULOOUJ VDWDQ RQHWP HZ RXOG UHP DLQ DW UJ V ([SORUDWRQ Z RXOG FRQWQXH IRUDQ DGGLWRQDO \HDUV SOXVWR \HDUV IRUUHFOP DWRQ ' XUJ WKLVWP H WKHUHZ RXOG EHHP LWLRQV IURP GLHMHOHTXLSP HQWDQG VXUDFHGLWXUEDQFH (P LWLRQVZ RXOG EH UHSRUWG DQG WDFNHG DVSHUWH&ODW,, $ ILU3HUP LW 7 KHDSSOLFDQWFRP P LWWG(30 VDQG WKH IXJLWLYHGXWFRQWROSOQ DQG DWRFLDWG %0 3VZ RXOG UHP DLQ LQ SODFHWR P LQLP L]HDLUERUQH SDUWFXODWV %DUUFN Z RXOG FRQWQXHWKHUHOP DWRQ SURJUP WR UHFRQRXUDQG VHGGLWXUEHG DUHDVUHGXFLQJ WKHSRWHQWDO IRUZ LQGEORZ QGXW WURP H[SRVHG VXUDFHV $ ILUHP LWLRQVZ RXOG RFFXU EXWHIHFW WR DLUTXDOW Z RXOG EHP LQLP L]HG

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ $ OWLQDWLYH H[SORUDWRQ Z RXOG FRQWQXHXQGHUFXUHQWSHUP LWDQG DSSURYDOVLQ RSHQ DQG DFWLYHDUHDVRQ\ 1 HZ VXUDFHGLWXUEDQFHZ RXOG QRWRFFXU 5 HFOP DWRQ Z RUN Z RXOG EHFRQGXFWG IRORZ LQJ FRP SOHWRQ RI GULOOLQJ RSHUDWRQV 7 KH DSSOLFDQWFRP P LWWG(30 V IXJLWLYHGXWFRQWROSOQ DQG DWRFLDWG %0 3VZ RXOG UHP DLQ LQ SODFHWR P LQLP L]HDLUERUQHSDUWFXODWV

&XP XODWLYH(IIHFW

7 KHFXP XODWLYHHIHFWDQD\VLVIRUDLUTXDOW FRQVLGHUVDLUHP LWLRQVIURP SDWWSUHVHQWDQG 5)) $ VRFFXUULQJ Z LWKLQ WKHDLUVKHG DWRFLDWG Z LWK WKUHHK\ GURJ UDSKLF DUHDV WKH&UHFHQW 9 DOOH\ * UDW9 DOOH\ DQG 3ICH9 DOOH\ 7 KHSURMHFW WKDWKDVHFRQWLEXWG WR DLUHP LWLRQVIQ WKHVHDUHDV SUP DUL\ IURP VXUDFHGLWXUEDQFHDFWLWLHVDQG DWRFLDWG HTXLSP HQWXVH DUH VKRZ QIQ **7 DEOH** 7 KLVIVDOOJ HY XQGHYHORSHG UHJIRQ FKDUDFWUJ HG E\ Z IGH RSHQ EDVLQV + & &8 (3 HP LWLRQVDUHUHXODWG XQGHUD&ODW,, $ ILU3HUP LWDQG DUHP IQIP L]HG Z LWK IP SOHP HQWDWRQ RI DGXWFRQWROSOQ %0 3V DQG UHFOP DWRQ RI GLWXUEHG DUHDVWR UHGXFHWKH SRWHQWDO IRUZ LQGEORZ QGXW (P LWLRQVIURP + & &8 (3 DFWLWLHVZ RXOG RFFXU EXWUHXODWG OHYHOVZ RXOG GLVLSDWDQG Z RXOG QRWFRP EICHZ LWK WKRVHIURP RWKHUDFWRQVWR UHVXOWQ VJ QLIICDQWFXP XODWLYHHIHFW

: DVWW

7 KLVVHFWRQ FRQVLGHUVSRWQWDOGLUHFWLQGLUHFWDQG FXP XODWLYHIP SDFWVDWRFLDWG Z LWK KDQGDQJ DQG GLVSRVDORI Z DWWV ICFOXGLQJ KD]DUGRXVZ DWWV Z KLFK P D\ EHXVHG RUJ HQHUDWG DW& &8 (3 7 KHDQD\VLVUHDICFOXGHVWKH+ & &8 (3 3DQERXQGU DQG WDQVSRUWWRQ URXWVXVHG WR GLVSRVHRI VROG Z DWWV

+ D]DUGRXVZ DWWLVZ DWWWKDWVGDQJHURXVRUSRWQWDO KDUP IXOWR RXUKHDOWK RUWKH HQYLURQP HQW $ FFRUGLQJ WR WKH(3$ DP DWUDOP XWWLWWEHFDWLIHG DVVRDG WR EHFRQGHUHG DKD]DUGRXVZ DWW 7 KH(3$ IXUWKHUGHILQHVD VRDG Z DWWDVDQ J DUEDJHRUUHXVH VOXGJHIURP

DZ DWWZ DWLUWHDW HQVSODQWZ DWLUVXSSO\ WWHDW HQVSODQWRUDLUSRQXWRQ FRQWRQIDFLDW DQG RWKHUGLVFDUGHG P DWUDO ICFXGLQJ VRLG QDXLG VHP L VRLG RUFRQWLQHG J DVHRXVP DWUDO UHVXOWQJ IURP ICGXVWDO FRP P HUFDO P ICLQJ DQG DJ UFXOXUDORSHUDWRQV DQG FRP P XQLW DFWYLWHV 8 6(3$

$ IIHFWG (QYLURQP HQW DWW

7 KHDIIHFWG HQYLURQP HQWLQFXGHVSHRSOHDQG WKHQDXUDOUHUXFHVZ KR P D\ FRP HIQ FRQWFW Z LWK RUZ KIFK P D\ EHKDUP HG E\ Z DWWJ HQHUDWG DW+ & &8 (3 1 DXUDOUHUXFHVICFXGH Z DWU DLU VRLQV DQG EIRQJ IFDOUHUXFHV + & &8 (3 DFWYLWHVGR QRWJ HQHUDW QRUXVHRU GLVSRVHRI DQ\ KDJ DUGRXVZ DWW 3HWROHXP SURGXFWZ RXQ EHXVHG RQ VLW 7 KH+ & &8 (3 VSLOOFRQWQJ HQF\ SODQ SURYLGHVWWQGDG RSHUDWQJ SURFHGXUHVWR P ICLP I]HWKHSRWQWDOIRU KDUP IXOP DWUDOVWR ICQWUDFWZ LWK YXQHUDEOHHQDXUDOUHUXFHV 6RQG Z DWW J DUEDJ H KXP DQ KDVEHHQ DQG Z RXQ EHJ HQHUDWG IURP + & &8 (3 DFWYLWHV Z LWK WKH VRQG Z DWW WDQVRUWG WR RII VLWGLVSRVDOIDFLDWHV

(QYLURQP HQWO&RQVHTXHQFHV: DWW

3URSRVHG $ FWRQ

7 KHH[SORUDWRQ DFWYLWHVDWRFIDWG Z LWK WKH DFUHVRI VXUFHGLWXUEDQFHGLG QRWJ HQHUDW KD]DUGRXVZ DWW 6RQG QRQ KD]DUGRXVZ DWW ICFXGLQJ J DUEDJ HDQG KXP DQ Z DWW KDVEHHQ WDQVRUWG WR RII VLWDXWRU]HG GLVSRVDOIDFLDWHV 7 KHSRWQWDOIRUVSLOOVWR RFFXUKDYH P ICLP I]HG WKURXJ K SUHYHQWRQ P HDXUHVRXWQHG IQ WKH VSLOOFRQWQJ HQF\ SODQ

7 KH3URSRVHG $ FWRQ RI DQ DGGLWRQDO DFUHVZ RXQG QRWFKDQJ HFXUHQWZ DWWP DQDJ HP HQW 1 R KD]DUGRXVZ DWW Z RXQG EHJ HQHUDWG DQG SURSHURII VLWGLVSRVDORI J DUEDJ HDQG KXP DQ Z DWW Z RXQG FRQWQXH 7 KH VSLOOFRQWQJ HQF\ SODQ Z RXQG UHP DIQ IQ SODFH DQG DVVXFK IP SDFW DWRFIDWG Z LWK Z DWW DUHQRWDQWFIS DWG

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ$ OWLQDWYH WKHUHZ RXQG EHQR FKDQJ HIQ FXUHQWZ DWWP DQDJ HP HQWDQG VSLOOSUHYHQWRQ SUDFWFHV 7 KH VSLOOFRQWQJ HQF\ SODQ Z RXQG UHP DIQ IQ SODFH DQG DVVXFK IP SDFW DWRFIDWG Z LWK Z DWW DUHQRWDQWFIS DWG

&XP XODWYH(IIHFW

3RWQWDOGLUHFWDQG IQGLUHFWP SDFW DWRFIDWG Z LWK Z DWW DUHQRWDQWFIS DWG 7 KHUHRUH FXP XODWYHHI IHFW DUHQRWDQWFIS DWG

9 IVXDO5 HVRXUFHV

7 KLVVHFWRQ GHIQHVWKH YLVXDOUHVRXUFHVIRUWKH+ & &8 (3 DUHDDQG DQD0]HVSRWQWDOGLUHFW IQGLUHFWDQG FXP XODWYHIP SDFW WR YLVXDOUHVRXUFHVIURP + & &8 (3 DFWYLWHV 7 KH%/ 0 9 IVXDO5 HVRXUFH0 DQDJ HP HQW9 5 0 \ WWP SURYLGHVDZ D\ WR IGHQW\ DQG HYDOXDWYLVXDO YDOXHVIQ RUGHUWR GHWUP ICHDSSURSUDWOHYHOVRI P DQDJ HP HQW9 5 0 FODWHVDUHDWJ QHG WR DUHDVGXUQJ UHVRXUFHP DQDJ HP HQWSODQQIQJ 7 KH9 5 0 \ WWP DOR SURYLGHVDZ D\ WR DQD0]H WKHSRWQWDOYLVXDOIP SDFW DQG DSSO\ YLVXDOGHMJ QWFKQTXHVWR HQVXUHWKDWXUDFH GLWXUEIQJ

DFWXDOWHVRUGHYHORSP HQWDUHLQKDUP RQ\ Z LWK WKHUVXUURXQGLQJ V $ YLVXDOUHVRXUFHLQYHQWRU\ 9 5, Z DVP RWWUHFHQW FRP SOHWG IRUWKH %0 ' IQ

7 KHDQDO\VLVFRQGXFWHGVNH RRFDWRQVZ KHUHWKH+ & &8 (3 DUHDZ RXOG EH YLVLEOH WR WKHSXEOLF DQG FRQGHVWKHSRWQWDOIRUIP SDFWEDVHG RQ9 5 0 FODVVHV ' ILHFWDQG LQGLUHFWHIHFW FRQGHUWKHYLHZ VKHG RI WKH+ & &8 (3 3 ODQ ERXQGDU\ DUHD &XP XODWLYHHIIHFWFRQGHUWKH SDWWSUHVHQWDQG5)) $ VRI WKH&RUW] 0 RXQWDLQV

$ IIHFWG (QYLURQP HQW0 LVXDO5 HVRXUFHV

7 KH+ & &8 (3 DUHDLVZ LWKLQ9 5 0 &ODVV,, DQG,9 DVGHVFUEHG LQ WKH6KRVKRQH (XUHND5 0 3 %/ 0 D

7 KHP DQDJHP HQWREMHFWLYHVIRU9 5 0 &ODVV,, DQG,9 DUHDVIRORZ V %/ 0 E

9 5 0 &ODVV,, 2 EMHFWLYH ³« LVWR SDUWDOO UHWDLQ WKHH[LWLQJ FKDUDFWHURI WKHODQGVFDSH 7 KH OHYHORI FKDQJH WR WKHFKDUDFWHUWWF ODQGVFDSH VKRXOG EHP RGHUDW 0 DQDJHP HQWFRWLWHVP D\ DWWUDFWDWWQWRQ EXWKRXOG QRWGRP LQDWWKHYLHZ RI WKHFDXXDORE\HUYHU &KDQJHVVKRXOG UHSHDWWKHEDWF HDP HQWVIRXQG LQ WKHSUHGRP LQDQWZDXUDOHDXUHVRI WKHFKDUDFWUWWF ODQGVFDSH´

9 5 0 &ODVV,9 2 EMHFWLYH ³« LVWR SURYLGHIRUP DQDJHP HQWFRWLWHVZ KIFK UHTXLUHP DWU P RGLIIFDWRQRI WKHH[LWLQJ FKDUDFWURI WKHODQGVFDSH 7 KHOHYHORI FKDQJH WR WKHFKDUDFWUWWF ODQGVFDSHFDQ EHKLJK 7 KHWHP DQDJHP HQWFRWLWHVP D\ GRP LQDWWKHYLHZ DQG EHWKHP DWU IRFXVRI YLHZ HUDWWQWRQ + RZ HYHU HYHU DWWP SWWKRXOG EHP DGHWR P LQIP I]HWKHIP SDFWRI WKHVHFRWWLWHVWKURXJK FDUHXOORFDWRQ P LQIP DOGLWXUEDQFH DQG UHSHDWQJ WKHEDWF HDP HQW´

7 KH+ & &8 (3 DUHDLVORFDWG LQ WKHQRUWKHUQ* UHDW%DVLQ VHFWRQRI WKH%DVLQ DQG5 DQJH 3 K\ VRJ UDSKIF 3 URYLQFH %/ 0 D 7 KH* UHDW%DVLQ LVFKDUDFWUI]HG E\ DUK\ WKP IF SDWWHUQ RI LVRODWG P RXQWDLQ UDQJHVDQG EURDG VZ HHSLQJ EDLQV &OHDUVNHVDQG EURDG RSHQ YLWWV FKDUDFWUI]HWKLVODQGVFDSH %/ 0 7 KH+ & &8 (3 DUHDLQFOXGHVURODQJ WR DQ XODUKLGV DQG UGJHVZ LWK VWHS VLGHVORSHV 7 KHDUHDLVFRYHUHG Z LWK DSDWWLQRI VDJHEUXVK DQG J UDVWHVDW OR Z HUHOHYDWRQVDQG MXQLSHUDQG P I[HG VKUXEVDWKJ KHUHOHYDWRQV (YLGHQFHRI SDWWLUHHYHQW DSSHDUVDVDFKDQJHIQ W[VXUHDQG FROR UWR WKHRWKHZ LVHKRP RJ HQRXVYHJ HWDWRQ SDWWLQVRQ WKH ODQGVFDSH 6RLOFROORUVUDQJHIURP EHJ HWR DFKDON\ RII Z KLWZ KIFK Z KHQ H[SRVHG FRQWDW KJ KO\ Z LWK WKHVXUURXQGLQJ YHJ HWDWRQ 5 RFN FROORUVYDU\ IURP OJ KWWR GDUN EURZ Q WR EXLQW RUDQJH %/ 0 D

0 DQ P DGHIHDXUHVDUHP RVW OLQHDU SUHGRP LQDWW FRQWLWQJ RI URDGV IHQFHV DQG SRZ HU OLQHV ' ULOSDGV UHFOP DWRQ DUHDV FRP P XQIFDWRQ VLWW DQG WKH[SORUDWRQ RIIIFHDUHDOR YLVXDOIHDXUHVRI WKHODQGVFDSH 7 KHIHDXUHVFUHDWZ HDN WR P RGHUDWFRQWDWZ LWK WKHJ HQWOH VORSLQJ OLQHVRI WKH&RUW] 0 RXQWDLQV

(QYLURQP HQWDO&RQVHTXHQFHV/9 LVXDO5 HVRXUFHV

3 URSRVHG $ FWLRQ

) URP DGLWWQFH + RUVH&DQ\ RQLV YLVLEOH WR WDYHOHUV RQ 6WDWH + LJKZ D\ + RZ HYHU WKHUHD LVLQ WKHEDFNJURXQG DQG WKHIRRWKLOVDQG FDQ\RQV RI WKH&RUW] 0 RXQWDLQVKLGHFRP SOHWHYLHZ V IURP DQ\ RQHYDQWDJHSRLQW7 KHUHXXOWQJ YLHZ LVDEOHQGLQJ RI WKHLQGLYLGXDOGLVXXLEDQFH IHDXUHVZ LWKLQ WKHQDXUDODQGVFDSH + XP DQ YLVLWDWRQ LVORZ DQG WKHGLVXXLEDQFHDFWXWLWHVDUH QRWZ LWKLQ YLHZ RI OLJ HSRSXODWRQ FHQWHV 7 KHYLXDOHIHFWRI P ILQJ DQG H[SORUDWRQ DFWXWLWHVLQ WKLVDUHDUHP ILQRUDQG DUHFRQVLWWQWZ LWK WKH9 5 0 FODVVREMHFWXYHV

6XUDFHGLVXXLEDQFHRI DFUHVIURP H[SORUDWRQ DFWXWLWHVKDVDOWHUHG WKHHOPH HQWRI OLQHDQG FROORULQ WKH+ & &8 (3 DUHD SDUWFXODUOQ ILQ+ RUVH&DQ\ RQ $ VUFHOP DWRQ KDVEHHQ FRP SOHWG DQG FRQWDWVLQ OLQHUHGXFHG WKHRYHUDOOYLVXDOHIHFWKDVGP ILQLVKHG + RZ HYHU HIHFWVRQ OLQH DQG FROORUFRQWQXH

8 QGHUWKH3URSRVHG $ FWLRQ IRUDQ DGGLWLRQDO DFUHVRI VXUDFHGLVXXLEDQFH DOORZ DEOHVXUDFH GLVXXLEDQFHZ RXOG ILQFUHDVHWX DWXWDORI DFUHV $ GGLWLRQDOHIHFWVRQOLQHDQG FROORUZ RXOG RFFXU

7 R FRQIRUP WR WKH9 5 0 VWDQGDUGVGLVFXVVHG DERYH GXULQJ DQ\ SLQ\RQ NXLSHUWHDW HQW JUHDWUVDJHJURXVH(30 IP SOHP HQWDWRQ WKHHGJHVRI WHDWG DUHDVZ RXOG EH³ IHDWKHUHG DQG ZRXOG IROORZ WKHFRQWRXUVRI WKHODQGVFDSH ILQRUGHUWR DYRLG WKHDSSHDUDQFHRI REYLRXVKXP DQ ILOXHQFH ([SHUHQFHZ LWK VLP LODUSLQ RQ NXLSHUWKQQLQ SURMHFWLQ WKHSDWWKDVVKRZ QWKDW WKHYLVXDOIP SDFWDUHUHDWXHO XQREWXVLYHLQ WKHVKRUWWUP DQG DOP RWXQQRWFHDEOHDIWUWZR \HDUV ZKHQ QHHGOHVKDYHIDOHQ IURP GRZ QHG WHHV ,Q WKHORQ WUP JUHDWUVDJHJURXVH(30 IP SOHP HQWDWRQ P D\ UHXXOWQ DYLXDODVSHFVSUHHUDEOHWR RQHGRP ILQDWG DQG REVFXUHG E\ GHQVHWDQGVRI FRQIHUVWKDWP D\ UHXXOWZ LWRXXWKHJUHDWUVDJHJURXVH(30

9 LXDOUHRXUFHVKDYHEHHQ DQG ZRXOG FRQWQXH WR EHDIIHFWG E\ H[SORUDWRQ DFWXWLWHV 5 HFOP DWRQ ZRXOG UHGXFHHIIHFWVWR OLQHDQG FROURYHUWP H ,P SDFWRI WKH3URSRVHG $ FWLRQ ZRXOG EHP ILQP I]HG ZLWK UHFOP DWRQ DFWXWLWHVWKDWP IP IF WKHEDVF HOHP HQWRI WKH FKDUDFWUWF ODQGVFDSH

7 R P ILQP I]HHIIHFWIURP OJKWQJ %DUUFN ZRXOG XWLO]HKRRGHG WDWRQDU OJKWDQG OJKW SOOQW / LJKWQJ ZRXOG EHGLUHFWG RQWR WKHSHUWQHQWWUWRQ\ DQG DZ D\ IURP DGMFHQWDUHDV QRWQ XVHZ LWK VDHW DQG SURSHUOJKWQJ RI WKHDFWYHZ RUN DUHDVEHQJ WKHSUP DU JRDO / LJKWQJ II[VXUHVZ RXOG EHKRRGHG DQG VKHOHG DVDSSURSUDW %DUUFN ZRXOG XWLO]HOJKWQJ GHJ QHG WR UHGXFHWKHIP SDFWWR QJKWNHV

: LWK VXFFHVVIXOUHOP DWRQ DQG UHYHJHWDWRQ RI WKH H[SORUDWRQ URDGVDQG GUOOWWV OROQ WKP YLVXDOIP SDFWZ RXOG EHP ILQP I]HG (IIHFWZ RXOG QRWUHXXOWQ VJQIIFDQWP SDFWWR YLVXDO UHVRXUFHVRU9 5 0 FODVREMHFWXYHV

1 R$ FWLRQ

8 QGHUWKH1 R $ FWLRQ$ OWLQDWYH H[SORUDWRQ DQG UHFOP DWRQ ZRXOG FRQWQXHILQ RSHQ DQG DFWXYHDUHDVRQ\ $ GGLWRQDOVXUDFHGLVXXLEDQFHZ RXOG QRWRFFXU 5 HFOP DWRQ ZRXOG UHGXFH

WKHFKDQJHVLQOLQHDQGFRORURYHUWKH 8QGHUWKH1 R$ FWRQ$ OWLQDWLYH IP SDFWVWR YLVXDO UHVRXUFHVIURP + & &8 (3 DFWLYLWHVZ RXOG EHP IQIP I]HG RYHUWP H

&XP XODWLYH(IIHFW

: LWK VXFFHVVIXOUHOD P DWRQ DQG UHYHJHDWRQ RI WKHH[SORUDWRQ URDGVDQG GULOOWLWV ORQJ WLUP YLXDOIP SDFWZ RXOG EHP IQIP I]HG DQG WKH9 5 0 REWFWLYHVIQ WKH+ & &8 (3 DUHDZ RXOG EH P HW6 IJ QIIFDQWFXP XODWLYHHIIHFWIURP + & &8 (3 H[SORUDWRQ DFWLYLWHVZ RXOG QRWRFFXU

5 HFUHDWRQDO5 HWRXUFHV

7 KLVVHFWRQ SUHVHQWVUHFUHDWRQDORSSRUWXQLWHVRI WKH+ & &8 (3 DUHD 7 KHDQDO VLVIRU SRWQWDOGLUHFWDQG IQGLUHFWHIIHFWWR UHFUHDWRQDOUHVRXUFHVFRQVLGHUVHIIHFWWR WKRVH RSSRUWXQLWHVIGHQWLIHG DVRFFXUUQJ Z LWKQ WKH+ & &8 (3 3DQ ERXQGDU\ 7 KHFXP XODWLYH DQDO VLVFRQVLGHUVWKH VXUURXQGLQJ &RUWM] 0 RXQWDQV

$ IIHFWG(QYLURQP HQW5 HFUHDWRQDO5 HWRXUFHV

7 KH+ & &8 (3 DUHDIVIVRODWG DQG XQGHYHORSHG 7 KH(ONR 5 0 3 5 2 ' GHMJ QDWG DSRUWRQ RI WKH+ & &8 (3 DUHDDV³ RSHQ´ WR RII URDG YHKIFOHXVH %/ 0 7 KHUHDUHQR UHFUHDWRQDO IDFLOWHVZ LWKQ WKH+ & &8 (3 DUHD DQG IQ WKVSDUWRI 1 HYDGD GHYHORSHG UHFUHDWRQDO RSSRUWXQLWHVDUHUHDWXHO VSDUVH ,QWKH+ & &8 (3 DUHD RSSRUWXQLWHVIRUSXEOF UHFUHDWRQ SUP DUIO IQFOXGH2 + 9 XVH KXQWQJ DQG FDP SIQJ 0 RXQWDQ EINQJ KRUVHEDFN UGIQJ VJ KWHHQJ RXWGRRUSKRWJ UDSK\ QDXUHWXG\ Z IOGDIH YIHZ IQJ EILG Z DWKIQJ DQG URFN FRORHFWQJ P D\ DOR RFFXU

(QYLURQP HQWO&RQVHUXHQFHV5 HFUHDWRQDO5 HWRXUFHV

3 URSRVHG $ FWRQ

7 KH3 URSRVHG $ FWRQ Z RXOG QRWFKDQJ HH[LWQJ DFFHVVWR SXEOF DQGVZ LWKQ WKH+ & &8 (3 DUHD IRUUHFUHDWRQDOXVHV &RQWXFWRQ RI QHZ URDGVFRXOG WP SRUDUO IP SURYHDFFHVVIRU VRP HWSHVRI UHFUHDWRQ DFWLYLWHV ([SORUDWRQ DFWLYLWHVDVWRFDWG Z LWK WKH DFUHVRI VXUDFHGLWXUEDQFHKDYHUHGXFHG UHFUHDWRQ RSSRUWXQLWHV SDUWFXOD0 IQ+ RUVH&DQ RQ 2 + 9 XVHUV KXQWUV DQG FDP SHUVDUHQNHO WKHP RWWDIHFWG J URXSV 7 KH+ & &8 (3 DUHDIVQRW NQRZ QDVDSRSXODUGHWQDWQ IRUSXEOF XVHDQG QR DQQXDOFRP P HUFDORUFRP SHWWYH SHUP LWWG HYHQWRFFXUIQ WKHDUHD $ FFHVVURDGVDQG RWKHUGLWXUEHG DUHDVZ RXOG EH UHFDDP HG

7 KH3 URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVZ RXOG UHXXOWQ DOOWZ DEOHVXUDFHGLWXUEDQFH RI DFUHV 7 KHGXUDWRQ RI WKHH[SORUDWRQ DFWLYLWHVDQG UHFDP DWRQ Z RXOG FRQWQXHIRU \ HDUV 7 KH+ & &8 (3 DUHDIQ(XUFND&RXQW OHVIQ WKH1 ' 2 : 0 DQDJ HP HQW8 QIW 0 8 7 KHUHDUH FRP P HUFDORXWWWLJ XIGHVSHUP LWWG WR RSHUDWWIQ WKH%0 ' RI Z KIFK0 8 IVDSDUW $ FFHVVURDGVDQG RWKHUGLWXUEHG DUHDVZ RXOG EH UHFDDP HG 8 QGHUWKH3 URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHV P IQIP DOIP SDFWVWR UHFUHDWRQ Z RXOG RFFXUIRUDQ HWWP DWG \ HDUV

7 KHIP SOHP HQWDWRQ RI WKHSIQ\ RQ NXQLSHUWHDW HQWRSWRQ RI WKHJ UHDWUVDJ HJ URXVH(30 DV SDUWRI WKH3 URSRVHG $ FWRQ Z LWKLWVDWRFDWG SRWQWDOFKDIQ VDZ QRIVH FRXOG KDYHIP P HGDWW HIIHFWXSRQ UHFUHDWRQDORSSRUWXQLWHVIQ WKHSURSRVHG SURMHFWDUHDGXUIQJ IP SOHP HQWDWRQ E\

GHWDFWQJ IURP VWHQDXUDQHVVRI VWHH[SHUHQFH) RORZ LQJ VWHDV HQWDQG LQ VWHORQJ VWLP KRZ HYHU UHFUHDWRQDORSSRUWXQLWHV VXFK DV KLNLQJ KRUVHEDFN ULGLQJ ZLOGOLIH YLHZ LQJ DQG KXQWLQJ ZRXOG EHHQKDQFHG E\ WKHSUHVHUYDWRQ RI SODQWZ LOGOLIH DQG DHWKHWF GLYHUVLW

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ$ OWLQDWYH H[SORUDWRQ DQG UHFOP DWRQ DFWYLWHVZ RXOG FRQWQXHLQ RSHQ DQG DFWYHDUHVRQ) 5 HFUHDWRQ RSSRUWXQLWHVZ RXOG FRQWQXHWR EH UHGXFHG XQWOUHFOP DWRQ LVFRP SOHWH 7 KHDUHDLVQRWQRZ QDVDSRSXODUGHWWQDWRQ IRUSXEOF XVHDQG QR DQQXDO FRP P HUFDORUFRP SHWWYHSHUP LWWG HYHQWRFFXULQ WKHDUHD 7 KHGXUDWRQ Z RXOG EH VKRUWU WKDQ XQGHUWKH3 URSRVHG$ FWRQ (IIHFWV WR UHFUHDWRQDOUHVRXUFHVZ RXOG EH QHJOJ IEOH

&XP XODWYH(IIHFW

2 WKHUSDWWSUHVHQWDQG5)) $ P ICIQJ DQG H[SORUDWRQ SURYMFWLQ WKH&RUW] 0 RXQWLQVKDYH UHGXFHG UHFUHDWRQDORSSRUWXQLWHVE\ FKDQJLQJ WKHQDXUDOFKDUDFWUWWFVRI WKHODQGVFDSH WKXV SRWQWDOO UHGXFLQJ KXQWQJ RSSRUWXQLWHV : ICGILUHVKDYHUHGXFHG UHFUHDWRQDORSSRUWXQLWHVE\ DOWLQJ Z ICOGOLHKDEITWV ([SORUDWRQ DFWYLWHVDWRFIDWG Z IWK WKH[LWWQJ DFUHVRI VXUDFHGLWXUEDQFHKDYHDOR UHGXFHG UHFUHDWRQDORSSRUWXQLWHV 7 KH3 URSRVHG$ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUDFHGLWXUEDQFHZ RXOG FRQWQXHWR UHGXFH WKHHHRSSRUWXQLWHVIRU DQRWKHU \HDUV ([SORUDWRQ DFWYLWHVDWRFIDWG Z IWK + & &8 (3 Z RXOG UHXXOWQ D VKRUWWMP WP SRUD\ UHGXFWRQ RI UHFUHDWRQ RSSRUWXQLWHV + RZ HYHU DUHDVQHDUWKH+ & &8 (3 DUHD RI IHU VIP ICDUUHFUHDWRQDORSSRUWXQLWHV ,Q WKHORQJ WMP UHFOP DWRQ Z RXOG UHXXLQ WKHDFUHDJ HWR UHFUHDWRQDOXVHV 7 KHFRP EIQHG HIIHFWRI RWKHUSURYMFWLVQRWDQWFSDWG WR UHXXOWQ D VJ QIIFDQWFXP XODWYHHIIHFWWR UHFUHDWRQDOUHVRXUFHV

6 RFIDODQG(FRQRP IF 9 DOXHV

+ & &8 (3 IVORFDWG IQ(XUHND DQG/ DQGHUFRXQWHVDSSUR[IP DWO) P IOHVVRXWKZ HWWRI (ONR 1 HYDGD DQG IVDFFHWHG YID1 HYDGD6 WDWH5 RXW RU1 HYDGD6 WDWH5 RXW (XUHND DQG / DQGHUFRXQWHVDUHORFDWG IQ QRUWKFHQWDO1 HYDGD DQG HQFRP SDWDSSUR[IP DWO) VIXDUH P IOHVDQG VIXDUHP IOHV UHSHFWWHO) 7 KHVWG\ DUHDIRUGIUHFWIQGIUHFWDQG FXP XODWYH HIIHFWIRUVRFIDODQG HFRQRP IF YDOXHVIQFOXGHV(ONR (XUHND DQG/ DQGHUFRXQWHV 7 KH UDWRQDOHIIRUIQFOXGIQ (ONR &RXQW Z IWIQ WKH VRFIDODQG HFRQRP IF VWG\ DUHDIVWDWWH P DWUW RI WKHZ RUNHVHP SOR\ HG E\ %DUUFNIRUWKHH[SORUDWRQ DFWYLWHVDW+ & &8 (3 OYHIQ WKHFIW RI (ONR

$ IIHFWG(QYLURQP HQW6 RFIDODQG(FRQRP IF 9 DOXHV

(ONR &RXQW IVWKHOJ HWRI WKHWKUHHFRXQWHVIQ WKHDQD) VIVDUHD / DQGHU&RXQW IVWKH VHFRQG OJ HW **7 DEOH** SUHVHQWVWKHSRSXODWRQ OHYHOVDQG JURZ WK UDWHVIRUWKHHQWH6 WDWH RI 1 HYDGD (ONR (XUHND DQG/ DQGHUFRXQWHV DQG WKHOJ HWWFRP P XQLWWHVZ IWIQ HDFK RI WKHVH WKUHHFRXQWHVIURP WKURXJ K

7 DEOH 3 RSXODWRQ &KDUDFWHULVWLFV

6 WDWH&RXQW 0 DUN &RP P XQLW					**$ QQXDO 3 HUFHQW * URZ WK 5 DWH IRU**	**$ QQXDO 3 HUFHQW * URZ WK 5 DWH IRU**	**$ QQXDO 3 HUFHQW * URZ WK 5 DWH IRU**
1 HYDGD							
(QR &RXQW							
(QR &LW							
6SULQJ &UHHN &' 3	1 $				1 $		
&DQQQ &LW							
(XUHND &RXQW							
(XUHND&' 3	1 $	1 $	1 $		1 $	1 $	1 $
/ DQGHU &RXQW							
%DWWH0 RXQWDLQ &' 3							

&' 3 ± &HQVXV' HVLJQDWHG3ODFH

6RXUFH 8 6 &HQVXV%XUHDX D E D E DQG

Employment and Income

,Q(QR &RXQW P RUH WKDQ SHUFHQW RI WKH SHRSOH Z RUNLQ WKH IRORZ LQJ LQGXVWULHV / HLVXUH DQG+ RVSLWDOW 7 UDGH 7 UDQVSRUWDWRQ DQG8 WLOLWLHV * RYHUQP HQWDQG1 DWXUDO5 HVRXUFHVDQG 0 LQLQJ 7 KHP DMRULW RI SHRSOH Z RUNLQ WKH(XUHND&RXQW Z RUNLQ WKH1 DWXUDO5 HVRXUFHVDQG 0 LQLQJ ,QGXVWULH 1 ' (75 D ,Q/ DQGHU&RXQW P RUH WKDQ SHUFHQW RI WKH SHRSOH Z RUN LQ WKH1 DWXUDO5 HVRXUFHVDQG0 LQLQJ ,QGXVWULH 1 ' (75 D

7 DEOH SUHVHQWVWKH $ QQXDO/ DERU) RUFH (P SOR\ P HQWDQG8 QHP SOR\ P HQWRUWKH 6WDWH RI 1 HYDGD (QR &RXQW (XUHND&RXQW DQG/ DQGHU&RXQW

7 DEOH $ QQXDO/ DERU) RUFHDQG(P SOR\ P HQW3 DWWH

/ RFDWRQ	**/ DERU) RUFH**	**(P SOR\ P HQW**	**8 QHP SOR\ P HQW**	**8 QHP SOR\ P HQW 5 DWH SHUFHQW**
1 HYDGD				
(QR &RXQW				
(XUHND &RXQW				
/ DQGHU &RXQW				

6RXUFH 1 ' (75 E

7KHDYHUDJHDQQXDOXQHPSOR\PHQWDWWIRU IRU(ONR(XUHND DQG/DQGHUFRXQWLHV WHUH DQG UHVHUYHV FRPSDUHG WR SHUFHQWURUWKHHQWLH6WDWHRI1HYDGD 7KHWRWDO XQHPSOR\PHQWLQWKHWXG\DUHDDYHUDJHG SHRSOHIRUWKH\HDU Z KIFK LVDERYHKLVWRUFDO OBZ V EXWLVP XFK OBZ HUWKDQ WKHWWDWZ IGHDYHUDJH 1'(75 E

7KHPHGLDQKRXVHKROGLQFRPHIURP IRUWKH6WDWHRI1HYDGD(ONR(XUHND DQG /DQGHUFRXQWLHV(ONR&LW DQG6SULQJ&UHHN&HQXV'HMJQDWHG3ODFH &'3 DUHVKRZQLQ **7DEOH** 7KHPHGLDQKRXVHKROGLQFRPHZDVQRWDYDLODEOHIRU&DUOLQ&LW(XUHND&'3RU %DWWOH0RXQWDLQ&'3 7KHPHGLDQKRXVHKROGLQFRPHIRU(ONR(XUHND DQG/DQGHUFRXQWLHV (ONR&LW DQG6SULQJ&UHHN&'3 LVKLJKHUWKDQWKH6WDWHRI1HYDGD¶VPHGLDQKRXVHKROG LQFRPH

7DEOH 0HGLDQ+RXVHKROG,QFRPH

/RFDWLRQ	**0HGLDQ+RXVHKROG ,QFRPH**
1HYDGD	
(ONR&RXQW	
(ONR&LW	
6SULQJ&UHHN&'3	
(XUHND&RXQW	
/DQGHU&RXQW	

6RXUFH 8 6&HQVXV%XUHDX

(QYLURQPHQWDO&RQVHTXHQFHV/6RFLDODQG(FRQRPLF9DOXHV

3URSRVHG$FWLRQ

8QHP SOR\PHQW(ONR(XUHND DQG/DQGHUFRXQWLHVLVOBZ HUWKDQ WKH VWDWZ IGHDYHUDJ HDQG PHGLDQ KRXVHKROGLQFRPH HVDUHKLJKHU+&&8(3H[SORUDWRQ DFWLYLWLHVIRUWKH DFUHVKDYH XVHG WKHOBFDOZ RUNIRUFHRI(ONR(XUHND DQG/DQGHUFRXQWLHV DQG KDYH VXSSRUWG WKHOBFDO HFRQRP\ 7KHVRFLDODQG HFRQRPLF IP SDFWKDVEHHQ EHQHIFLDO

7KH3URSRVHG$FWLRQIRUDQ DGGLWLRQDO DFUHVRI VXUDFHGLWXUEDQFHZ RXOG QRWUHXXOWQ DQ LQFUHDVHLQ WKHZ RUNIRUFHDW+&&8(3 7KHPDJ IP XP GUOOUJ FRXQWZ RXOG UHP DLQ DW UJ V 6RP HRI WKHH[SORUDWRQ Z RUNIRUFHLVKRXVHG DWD%DUUFN RZ QHG IDFLDW IQ3LQH9DOOH\ OBGJ LQJ DQG P HDVDUHSURYLGHG 7KH3URSRVHG$FWLRQIRUDQ DGGLWLRQDO DFUHVRI VXUDFH GLWXUEDQFHZ RXOG QRWUHXXOWQ P HDXUEOHFKDQJ HVWX VRFLDOLQ UDWXXFWXUH VXFK DVKRXVLQJ GHP DQG SXEOF IDFLDWHVDQG VHUYLFHV HP HJ HQF\ KHDWKFDUHVHUYLFHV DQG SXEOF HGXFDWRQ VLQFHLWVVDQWFLSDWG WKDWWKH[LWWQJ Z RUNIRUFHZ RXOG SURYLGH VXIIFLHQWWWI

,P SOHP HQWQJ WKHSLQ\RQ MXQLSHURSWRQRI WKHJ UHDWUVDJ HJ URXVH(30 Z RXOG SURYLGH VHDWRQDOZ RUNIRUDUHDWWYH) VP DOOFUHZ IRUXS WX \HDVDQG Z RXOG QRWDIHFWSRSXOWRQ J URZ WKLQ WKHDUHD QRUZ RXOG LWFUHDWRUSURYLGHDQ\ LQLUDWWXFWXUH Z KIFK Z RXOG LQGLUHFW LQGXFH VXEWWQWDOSRSXOWRQ J URZ WX 7KHFUHZ VZ RXOG KHS WX VXSSRUWOBFDOHFRQRP IHV

WKURXJK WKH SXUFKDVH RI IXHO J URFHUHV WRRO DQG HTXLSP HQW7 KLV VSHQGLQJ DFWLYLW DWRFLDWG Z LWK WKH SURSRVHG SURMHFW RXOG KDYHD VP DOOEXVSRVLWLYH HIIHFWRQ RFDOEXVLQHVVHVIQ(XUHND DQG/ DQGHUFRXQWHVEXWZ RXOG QRWP HDVXUDEO) FRQWLEXWWR WKHHFRQRP IF EHQHILWGHMFUIEHG IURP WKHH¦ SORUDWRQ DFWLYLWHV

1 R$ FWRQ

8 QGHUWKH1 R $ FWRQ$ OWHUQDWLYH H¦ SORUDWRQ DQG UHFOP DWRQ Z RXOG FRQWQXHWR KDYHD SRVLWLYH VRFLDODQ HFRQRP IF HIIHFWRQ WKHZ RUNIRUFHIQ(ONR (XUHND DQG/ DQGHUFRXQWHV 7 KH EHQHILWZ RXOG EH VKRUWWPP DVH¦ SORUDWRQ Z RXOG EHOP LWG WR RSHQ DQG DFWLYHDUHDV

&XP XODWLYH(IIHFW

Proposed Action

([SORUDWRQ DFWLYLWHVDW+ & &8 (3 KDYHDGGHG WR WKHFXUUHQWGHP DQG RQ WKHZ RUNIRUFH Z KIFK LVDOR XVHG WR VXSSRUWRWKHUSUHHQWDQG IXXUHIRUHHHDEOHP IQIQJ DQG H¦ SORUDWRQ SURMHFWIQ WKHDIIHFWG FRXQWHVRI (ONR (XUHND DQG/ DQGHU 7 KH3 URSRVHG $ FWRQ RI DQ DGGLWRQDO DFUHVRI VXUFHGLWXUEDQFHZ RXOG H¦ WQG WKHGXUDWRQ RI WKLVQHHG IRUZ RUNHLVIRU \ HDUV KRZ HYHU WKHGHP DQG Z RXOG QRWQFUHDVHWKHQXP EHURI Z RUNHLVQHHGG DQG Z RXOG WKHUHRUH QRVSOLFHDGLWRQDOEXLGHQ RQ VRFIDOIQIUDWXFWXUH 7 KH3 URSRVHG $ FWRQ GRHVQRWQGXFH VXEWDQWDOJ URZ WK RUFRQFHQWDWRQ RI SRSXODWRQ GLVSODFHDODJ HQXP EHURI SHRSOH FDXVHD VXEWDQWDOUHGXFWRQ IQ HP SOR\ P HQWUHXFHZ DJ HDQG VDDL\ HDQIQJ V FDXVHD VXEWDQWDOQHW IQFUHVHIQ FRXQW H¦ SHQGLXUHV RUFUHDWD VXEWDQWDOGHP DQG IRUSXEOF VHLYIFHV ,WV H¦ SHFWG WKDWWKHFXP XODWLYHDQG IQFUHP HQWDOVRFIRHFRQRP IF HIIHFWRI WKH3 URSRVHG $ FWRQ Z RXOG EHEHQHIFDODQG QRWWJ QIIFDQW

No Action

([SORUDWRQ DFWLYLWHVDW+ & &8 (3 Z RXOG FRQWQXHWR DGG WR WKHFXUUHQWGHP DQG RQ WKH Z RUNIRUFH Z KIFK LVDOR XVHG WR VXSSRUWRWKHUSUHHQWDQG IXXUHIRUHHHDEOHP IQIQJ DQG H¦ SORUDWRQ SURMHFWIQ WKHDIIHFWG FRXQWHVRI (ONR (XUHND DQG/ DQGHU 8 QGHUWKH1 R $ FWRQ $ OWHUQDWLYH WKHHIIHFWZ RXOG EHOHVWDQ XQGHUWKH3 URSRVHG $ FWRQ 7 KHWP HUDP HRI GHP DQG RQ WKHZ RUNIRUFHZ RXOG EHVKRUWWPP DVH¦ SORUDWRQ Z RXOG RQ) RFFXUIQ RSHQ DQG DFWLYHDUHDV

&RQVXOWDWRQ DQG &RRUGLQDWRQ

, QWURGXFWRQ

7 KLV($ Z DVSUHSDUHG DWWKH GLUHFWRQ RI WKH%/ 0 0 RXQW HZ LV) LHOG 2 IIIFH %0 ' E\ 7 HWD 7 HFK ,QF XQGHUDFRQWUDFWZ LWK %DUUIFN) RORRZ LQJ LVDOOWRI SHUVRQV J URXSV RU DQ] DWRQV DQG DJ HQFLHVFRQVXOWHG DVZ HOODVDOWRI LQGLYLGXDOVUHVSRQMEOHIRUWKHSUHSDUDWRQ UHYLHZ RI WKLV($

3 HUVRQV * URXSV 2 UJDQ]DWRQV DQG $ JHQFLHV &RQVXOWHG

) HGHUDO$ JHQFLHV

8 6) : 6

6WDWH$ JHQFLHV

&KHV0 DQ' HOOHQ 1 ' 2 : * ,6 &RRUGLQDWRU
/ LQGVH\ / HMP HLVWU 1 ' 2 : 0 LQLQJ %LRORJLVW
7 LP RWK\ 0 + HUUIFN 1 ' 2 : %LRORJLVW
(UIF 6 0 LVNRZ 1 1 + 3 %LRORJLVW DWW0 DQDJHU

1 DWXUH$ P HUIFDQV

%DWWH0 RXQWDLQ %DQG RI WKH 7 H0 RDN 7 UEHRI : HVWLQ 6KRVKRQH ' XFNZ DWU 6KRVKRQH 7 UEH (OKR %DQG RI WKH 7 H0 RDN 7 UEHRI : HVWLQ 6KRVKRQH 7 H0 RDN 7 UEHRI : HVWLQ 6KRVKRQH DQG < RP ED 6KRVKRQH 7 UEH

/ LVWRI 3 UHSDUHUV 5 HYLHZ HUV

%XUHDX RI / DQG 0 DQDJHP HQW0 RXQW HZ LV) LHOG 2 IIIFH %DWWH0 RXQWDLQ ' LVWUIFW

&KULV: RUWKLQJWRQ 3 URMHFW0 DQDJHU 3 ODQQLQJ DQG (QYLURQP HQWDO &RRUGLQDWRU
1 (3$ &RP SOLDQFH 6 RFLDOLDQG (FRQRP IFV
$ GDP &RFKUDQ 5 DQJHDQG 6 SHFLDOLVW* UDJLQJ 0 DQDJHP HQW9 HJHWDWRQ DQG 6RLOV
$ OGHQ 6KDOOPURW : DWU 5 HVRXUFHV
&KHUO/ D5 RTXH : DWWV + DJ DUGRXV DQG 6RLG
&UDJ 1 IFKRORV $ ILJ XDOW
0 DGDQ 6LQJK 0 LQHUDOV
%HQ &UDP HU 5 HFUHDWRQ DQG 9 LVXDOV
(WKDQ(OWZ RUWK
: LOOLDP 2 ¶1 HLOO : LOGOLH5 HVRXUFHV LQFOXGLQJ 0 LJ UDWRU %LUGVDQG 6SHFLDO 6WDXXV$ QLP DO6SHFLHV
-RKQ. LQVHU &XOXUDODQG 3 DOHRQWRORJLFDO
-RQ 6KHUYH 0 LQHUDOV* HRORJ\

%DUUFN+&&8(3 3DQRI2SHUDWRQV0RGLIFDWRQ$GGHQGXP DQG$PHQGPHQW($

-XDQ0DUWLQ	1DWXUH$PHUIFDQ&XOWXUDO&RQFHUQV
.DWK*UDKDP	*,6 6SHFLDOLVW
.HQW%RRPHU	:HHG0DQDJHPHQW6SHFLDOLVW1R[IRXV:HHGV,QYDVLYH DQG
	1RQQDWLYH3ODQW6SHFLHV
6KD\DH0RUWRQ	3URMHFW6HFRUG

7HWD7HFK,QF

&DPHR)RRG	1(3$&RPSOLDQFH
0IFKHOH:HGQHU	3URMHFW0DQDJHU1(3$&RPSOLDQFH
:HQG\5IHMK	:ILOGOLIH%LROROJLVW*,6$QDOVW
-LOO5HG	*HQHUDO5HVRXUFH6SHFLDOLVW3URMHFW6HFRUG'RFXPHQW
	3UHSDUDWRQ

%DUUFN

%RE,QJHUVROO	6HQIRU0DQDJHU
.IP EHUOH\:RO	3HUP LWWQJ 6SHFLDOLVW

5 HIHUHQFHV

$ 5 &$ ' ,6 8 6 ,QF $ 5 &$ ' ,6 D + &&&8 (3 ± * UHDWLU6 DJ HJ URXVH0 RQLWRULQJ 5 HSRUW 3 UHSDUHG IRU%DUUIFN 0 D\ S SOXVDSSHQGIFHV

BBBBB E + &&&8 (3 ± 3\ JP \ 5 DEEIW6 XUYH\ 5 HSRUW3 UHSDUHG IRU%DUUIFN -XQH S SOXVDSSHQGIFHV

BBBBB F + &&&8 (3 %XUURZ IQJ 2 Z O6 XUYH\ 5 HSRUW3 UHSDUHG IRU%DUUIFN 6 HSWP EHU S SOXVDSSHQGIFHV

BBBBB G + & &8 (3 %DW6 XUYH\ 5 HSRUW2 FWREHU S SOXVDSSHQGIFHV

BBBBB 1 RIVH0 RQLWRULQJ 7 HFKQIFDO0 HP RUDQGXP -DQ SOXV\SUHDGVKHHW

%DUUIFN D + RUVH&DQ\ RQ &RUUM] 8 QLIIHG ([SORUDWRQ3 URMHFW3 QDQ RI 2 SHUDWRQV$ J HQF\ 5 HTXHVWHG0 RGLIIFDWRQV1 9 1 $ DQG5 HFOP DWRQ3 HUP IWI R 6 XEP IWHG WR%/ 0 0 RXQW HZ IV) IHOG2 IIIFH %DWWH0 RXQWLQ' IVWUFW1 HYDGD 6 HSWP EHU

BBBBB E + RUVH&DQ\ RQ &RUUM] 8 QLIIHG ([SORUDWRQ3 URMHFW$ GGHQGXP WR WKH UHYLVHG3 QDQ RI 2 SHUDWRQV0 RGLIIFDWRQ1 9 1 $ DQG5 HFOP DWRQ3 HUP IWI R 6 XEP IWHG WR%/ 0 0 RXQW HZ IV) IHOG2 IIIFH %DWWH0 RXQWLQ' IVWUFW1 HYDGD 2 FWREHU

BBBBB F + RUVH&DQ\ RQ &RUUM] 8 QLIIHG ([SORUDWRQ3 URMHFW3 QDQ RI 2 SHUDWRQV $ P HQGP HQW1 9 1 DQG5 HFOP DWRQ3 HUP IWI R 6 XEP IWHG WR%/ 0 0 RXQW HZ IV) IHOG2 IIIFH %DWWH0 RXQWLQ' IVWUFW1 HYDGD 2 FWREHU

BBBBB G %DUUIFN $ SSOLFDWRQ IRU5 HYLVRQ RI &ODVV,, $ ILJ4 XDOLW 2 SHUDWLQJ 3 HUP IW $ 3 ' HFHP EHU

%DWV - ' *Herbaceous Response to Cattle Grazing Following Juniper Cutting in Oregon* 5 DQJHODQG (FROR\ DQG0 DQDJ HP HQW

%XFNQHU' 3 HUVRQDOFRP P XQLFDWRQ YLD HP DLOUH VSHFLDOWWXVSODQW

%XUHDX RI / DQG0 DQDJ HP HQW%/ 0 D 6KRVKRQH (XUHND5 HVRXUFH$ UHD5 HFRUG RI ' HFLVRQ %/ 0 %DWWH0 RXQWLQ' IVWUFW%DWWH0 RXQWLQ 1 HYDGD) HEUXDU

BBBBB E 0 DQXDO+ ± 9 LVXDO5 HVRXUFH, QYHQWRU -DQXDU $ FFHVVHG $ SUL $ YDLODEOHDW KWWS Z Z Z EOP J RY Z R VWHQ SURJ 5 HFUHDWRQ UHFUHFUHDWRQ QDWRQDO5 0 6 KWP O

BBBBBB (ONR 5 HVRXUFH 0 DQDJHP HQW 3 OD Q 5 HFRUG RI ' HFLVLRQ %/ 0 (ONR ' LVWUIFW 2 IIIFH (ONR 1 HYDGD 0 DUFK

BBBBBB %/ 0 0 DQXDO ,QWJUDWG : HHG 0 DQDJHP HQW $ FFHVVHG 6HSW $ YDLODEOH DW KWWS Z Z Z EOP JRY FDVWHQ SURJ Z HHGV SUIQWKWP O

BBBBBB ' HFLVLRQ 5 HFRUG DQG) LQGLQJ RI 1 R 6LJ QLIIFDQW P SDFWRU &RUUH * RO 0 ILQHV + RUVH &DQ RQ &RUUH 8 QLIIHG ([SORUDWRQ 3 URMHFW (QYLUROP HQWDO $ VHHVP HQWI 2 1 9 ($ DQG 3 OD Q RI 2 SHUDWRQV 1 2 1 3 $ $ XJ XW

BBBBBB D + RUVH &DQ RQ &RUUH 8 QLIIHG ([SORUDWRQ 3 URMHFW, (QYLUROP HQWDO $ VHHVP HQWI 9 ($ (ONR) IHO 2 IIIFH DQG %DWWH 0 RXQWDLQ) IHO 2 IIIFH 1 HYDGD &DVH) LOH 1 9 1 6HSWP EHU

BBBBBB E ' HFLVLRQ 5 HFRUG) LQGLQJ RI 1 R 6LJ QLIIFDQW P SDFWDQG 3 OD Q RI 2 SHUDWRQV $ SSURYDO IRU &RUUH * RO 0 ILQHV + RUVH &DQ RQ &RUUH 8 QLIIHG ([SORUDWRQ 3 URMHFW $ P HQGP HQW (QYLUROP HQWDO $ VHHVP HQWI R 1 9 ($ DQG 3 OD Q RI 2 SHUDWRQV 1 R 1 9 1 (ONR) IHO 2 IIIFH DQG %DWWH 0 RXQWDLQ) IHO 2 IIIFH 1 HYDGD 2 FWREHU

BBBBBB F 0 RXQW 7 HQDER 3 URSHUWLHV RI &XOXUDODQG 5 HDJ IRXV, P SRUWDQFH ' HWUP ILQDWRQV RI (QJ IEIOLW WR WKH 1 DWRQDO 5 HJ LWUI RI + LWRUF 3 OD FHV %/ 0 3 UHSDUHG E\ * ' I[RQ DQG 5 0 F* RQDJOH %/ 0 (ONR DQG %DWWH 0 RXQWDLQ) IHO 2 IIIFHV $ SUIO

BBBBBB ' HFLVLRQ IRU + RUVH &DQ RQ &RUUH 8 QLIIHG ([SORUDWRQ 3 URMHFW $ P HQGP HQW 1 ($ 1 9 ($ 1 HYDGD 6 WDWH 2 IIIFH $ SUIO

BBBBBB D %/ 0 1 DWRQDO (QYLUROP HQWDO 3 RODF\ $ FW + DQGERRN + %XUHDX RI / DQG 0 DQDJHP HQW 1 DWRQDO (QYLUROP HQWDO 3 RODF\ $ FW 3 URJ UDP 2 IIIFH RI WKH $ VLVWDQW ILHFWRU 5 HQHZ DEOH 5 HVRXUFHV DQG 3 OD QQLQJ : 2 & 6 WHHW : 0 DLO 6 WRS / 6 : DVKLQJWRQ ' & -DQXDU

BBBBBB E &RUUH + ILOV ([SDQVRQ 3 URMHFW 5 HFRUG RI ' HFLVRQ DQG 3 OD Q RI 2 SHUDWRQV $ P HQGP HQW $ SSURYDO 1 9 1 1 RYHP EHU S

BBBBBB F &RUUH + ILOV ([SDQVRQ 3 URMHFW) LQDO (QYLUROP HQWDO, P SDFW 6 WDWP HQW 6HSWP EHU %/ 0 %DWWH 0 RXQWDLQ) IHO 2 IIIFH %DWWH 0 RXQWDLQ 1 HYDGD $ YDLODEOH KWWS Z Z Z EOP JRY QY WHQ IR EDWWHBP RXQWDLQBIIHO EOP BLQIRUP DWRQ QDWRQDOBHQYL URQP HQWDOFRUUHBKLOVBH[SDQVRQ KWP O

BBBBBB $ GGHQGXP WR WKH+ RUVH&DQ RQ &RUWH 8 QLIIHG([SORUDWRQ 3URMHFW,
(QYLURQP HQWDO$ VVHVVP HQW 9 ($) LOH1 XP EHU 1 9 1 1 RYHP EHU

BBBBBB D ' HFLVRQ 5 HFRUG) LQGLQJ RI 1 R 6LJ QLIIFDQW P SDFWDQG 3QDQ RI 2 SHUDWRQV
$ SSURYDO IRU &RUWH * RQG0 ILQHV+ RUVH&DQ RQ &RUWH 8 QLIIHG([SORUDWRQ 3URMHFW
$ P HQGP HQW(QYLURQP HQWDO$ VVHVVP HQW R 1 9 ($ 2 $ GGHQGXP WR
(QYLURQP HQWDO$ VVHVVP HQW DQG 3QDQ RI 2 SHUDWRQV 1 R 1 9 1 %DWWH
0 RXQWDLQ' LVWUFW1 HYDGD 0 D\

BBBBBB E 0 RXQW+ RSH3URMHFW UDLW(QYLURQP HQWDO,P SDFW6 WDWP HQW8 6 %XUHDX RI
/ DQG0 DQDJ HP HQW1 9 1 DQG 1 9 1 ' HFHP EHU $ YDLODEOHDW
KWWS Z Z Z EOP JRY QY WWHQ IR EDWWHBP RXQWDLQBIHG EOP BIQIRUP DWRQ

BBBBBB F %/ 0) LQDO 6 HQWDWYH 6 SHFLHV/ LVW,0 1 9 $

BBBBBB D ' HFLVRQ IRU $ P HQGP HQW WR WKH 3QDQ RI 2 SHUDWRQV $ SSURYDO HWWLP LQDWRQ RI
5 HTXLUHG) LQDQFLDO* XDUDQWH 0 RXQW HZ LV) IHG 2 IIIFH 1 HYDGD $ XJ XW

BBBBBB E : KLW3 DSHURQ %/ 0 DQG 8 6) RUHVW6 HUYLFH 3 UHOP LQDU + DEWDW0 DS
$ YDLODEOH KWWS Z Z Z EOP JRY QY WWHQ SURJ Z LGOOLHJ UHDWLBVDJ H
JURXVHSUHOP LQDU BKDEWDWKW O

BBBBBB D ' HFLVRQ IRU $ P HQGP HQW WR WKH 3QDQ RI 2 SHUDWRQV $ SSURYDO HWWLP LQDWRQ RI
5 HTXLUHG) LQDQFLDO* XDUDQWH 0 RXQW HZ LV) IHG 2 IIIFH 1 HYDGD -DQXDU

BBBBBB D) LQDO (QYLURQP HQWDO$ VVHVVP HQW %DUUFN &RUW ,QF 1 9 1 > $ @
$ P HQGP HQW WR 3QDQ RI 2 SHUDWRQV DQG 5 HFODP DWRQ 3HUP LW $ SSOLFDWRQ
3URSRVHG 1 RUWK: DWW5 RFN) DFLOW 5 HDOJ QP HQW5 DQJ HDDQG) HQFH
$ GGLWRQ 6 WRFNSLOH5 HDRFDWRQ $ QFLOOD $ GGLWRQ) LOH1 R 1 9 1 %DWWH
0 RXQWDLQ' LVWUFW2 IIIFH 0 RXQW HZ LV) IHG 2 IIIFH) HEUXDU

BBBBBB E 1 R[IRXV: HHGVDQG,QYDWLYH 6 SHFLHV %/ 0 1 HYDGD¶V: DU $ JDLQW HHGV
$ FFHVVHG RQ 0 D\ $ YDLODEOHDW
KWWS Z Z Z EOP JRY QY WWHQ SURJ P RUHSURJ UDP VIQYDWLYHVSHFLHVKW O

BBBBBB F 6 WDWZ IGH: IOOOLH 6 XUYH\ 3URWRFROV ' 5 $) 7 %/ 0 1 HYDGD S

BBBBBB ,0 1 9 5 HYLVHG' ILHFWRQ IRU 3URSRVHG $ FWLYLWHV: LWKLQ * UHDWU
6DJ H * URXVH+ DEWDW) HEUXDU

%/ 0 HWDO 0 HP RUDQGXP RI 8 QGHUVWDQGLQJ $ P RQJ 8 6' , %/ 0 1 HYDGD 6 VWDW2 IIIFH
8 6' $ 8 6) 6 + XP ERQGW7 RI\ DEH1 DWRQDO) RUHVW1 HYDGD' HSDUW HQWRI
&RQVHUYDWRQ DQG 1 DXUDO5 HVRXUFHV DQG %DUUFN * RQG RI 1 RUWK $ P HUFD 1 HZ P RQW
0 LQLQJ &RU$RUDWRQ DQG RWKHUFRP SDQLHV5 HJ DUGLQJ WKH(VWDEOVKP HQWRI D
3DUWQHUVKLS IRUWKH&RQVHUYDWRQ DQG 3URWHFWRQ RI WKH* UHDWU6DJH * URXVH DQG
* UHDWU6DJH * URXVH+ DELWDW-XQ)

&RDWV 3 6 &DVD]]D 0 / %UXXHH %(5 IFFD 0 $ * XWWVRQ . % 2 YHUWRQ
& 7 6DQFKH] &KRSLWD (. URJHU 7 0 DXFK . 1 IHO/ + RZ H. * DUGQHU 6
(VSLQRVD 6 DQG' HDHKDQW ' - 6SDWDO) H[SOFLWP RGHOQJ RI J UHDWUVDJH
J URXVH *Centrocercus urophasianus* KDELWDWLQ 1 HYDGD DQG QRUWKHDWWUQ &DOLRUQLD $
GHFLVRQ VXSSRUWWRROIRUP DQDJ HP HQW8 6 * HRQRJ IFDO$ 6XUYH\ 2 SHQ) LOH5 HSRUW
S KWW CI GRLRU RIU

&RP HU 3 3 &UUW0 5 HG - + DN + + DP LOWRQ ' %UDXQ * . LWWO, 9 DUDH % 8 QQDVFK
6 $ XHU 0 &UHXWEXU ' 7 KHREDO DQG / . XWQHU *Central Basin and Range*
Rapid Ecoregional Assessment Report 3 UHSDUHG IRU WKH 8 6 ' HSDUW HQWRI WKH
,QWHUURU %XUHDX RI / DQG 0 DQDJ HP HQW SS $ SSHQGLFHV

&RQQHOO - : 0 $ 6FKURHGHU $ 5 6DQGV DQG & (%UDXQ * XLGHOLQHVWR P DQDJ H
VDJ HJ URXVHSRSXODWRQVDQG WKHLUKDELWDW -RXUQDORI : LOGOLIH0 DQDJ HP HQW

&RZ DUGLQ / 0 9 &DUWU) & * ROHWDQG(7 / D5 RH &ODVVLIFDWRQ RI Z HWODQGVDQG
GHHSZ DWUKDELWDWV RI WKH8 QLWHG 6WDWHV 8 6) LVK DQG: LOGOLIH6HUYLFH) : 6 2 %6
: DVKLQJWRQ ' &

' RP HQLFR 3 $ DQG) : 6FKZ DUW 3K\ VLFDODQG &KHP LFDO+ \ GURJ HRORJ\ -RKQ: LOH\
6RQV 1 HZ < RUN S

(DNLQ 7 (* URXQG Z DWU$ SSUDLVDORI 3LQH9 DOH\ (XUHND DQG(ONR &RXQWLHV
1 HYDGD * URXQG Z DWU5 HVRXUFHV5 HFRQQDLVDQFH6 HUHV 5 HSRUW 1 HYDGD
' HSDUW HQWRI &RQVHUYDWRQ DQG 1 DXUDO5 HVRXUFHV &DUVRQ &LW 1 HYDGD S

(6&2 $ VWRFLDWLV ,QF (6&2 1 R[IRXV: HHG 0 DQDJ HP HQW3 0DQ + & &8 (3 3URWHFW
$ UHD (XUHND &RXQW 1 HYDGD 3 UHSDUHG IRU %DUUFN * RQG RI 1 RUWK $ P HUFD 3 2
%R[(ONR 1 HYDGD 3 UHSDUHG E\ (6&2 $ VWRFLDWLV ,QF 3 2 %R[
%RXOGHU &2 $ SULO

BBBBBB D ' UDIW9 HJ HWDWRQ 7 \ SHVRI WKH+ &&&8 (3 $ UHD ILQ VXSSRUWRI P DSSLQJ (XUHND
DQG/ DQGHUFRXQWLHV 1 HYDGD (6&2 $ VWRFLDWLV ,QF 3 2 %R[%RXOGHU &2
0 DUFK

%DUUHFN+&&&8(3 3QDQ RI 2 SHUDWRQV0 RGLIIHDWRQ $GGHQGXP DQG $ P HQGP HQW($

BBBBBB E * UHDWLQJ6DJH* URXVH+ DELWDW6XLWDEOHDW 5DWQJ VIRU+&&&8(3 1 RYHP EHU

(XUHND&RXQW (XUHND&RXQW0 DVWHU3QDQ 0 DUFK

(YHUHWW (DQG) (5XVK $ %UHH $SSUDLVDORI WKH: DWHU5HVRXUFHVRI * UDVDQG &DUIR/ DNH9 DOOH\ V/ DQGHUDQG(XUHND&RXQWHV 1HYDGD : DWHU5HVRXUFHV 5HFRQQDLVDQFH6HUHV5HSRUW 1HYDGD' HSDUW HQWRI &RQVHUYDWRQ DQG1DXUDO 5HVRXUFHV &DUVRQ&LW 1HYDGD S

)OR\G 7 & 6 (QSKLFN * &KLVKROP . 0 DFN 5 * (OWRQ(0 $P P RQ DQG- ' %RRQH $VDVRI WKH%UHHGLQJ %LUGVRI 1HYDGD 8QLYHUVLW RI 1HYDGD3UHV 5HQR DQG/ DV9HJDV 1HYDGD S

* HRP HJD * URXQGZ DWHUJRZ P RGHOLQJ UHSRUWRUWKH&RUW] +LOOVH[SDQWLRQ SURMHFW SUHSDUHG IRU&RUW] * RQG0 ILHVE\ * HRP HJD ,QF $XJ XW

* ILOXO - DQG+ 0 DXXUV\ * HRORJ\ RI WKH&RUW] 4XDGUDQJOH 1HYDGD 8 6 * HRORJLFDO6XUYH %XOOHWQ

* UHDW%DVLQ%LUG2EVHUYDWRU * %%2 1HYDGD&RP SUHKHQVLYH%LUG&RQVHUYDWRQ 3QDQ YHU * UHDW%DVLQ%LUG2EVHUYDWRU 5HQR 1 9 $ YDLODEOHIRQOLQHDW Z Z Z JEER RU EILUGBFRQVHUYDWRQBSODQ KWP O

* UHDW%DVLQ(FRORJ\ * %(&RUW] 0 ILH 5DSWRU6XUYH 5HSRUWSUHSDUHG IRU %DUUHFN&RUW] 0 ILH 0 D S

* UHQ - 6 DQG- 7)OLQGHUV *Brachylagus idahoensis* 0 DP P DOOD Q6SHFLHV

+' 5 (QJLQHHULQJ ,QF +' 5 +RUVH&DQ RQ&RUW] 8QLIIHG([SORUDWRQ3URMHFW± 6XUIDFH: DWHU%DVHOLQH6WXG\ 0 DUFK 5HQR 1HYDGD

,0 / $ ILU6FLHQFH %DUUHFN0 HWHURORJLFDO DW0 RQWKO' DW$ YDLODEOHDW Z Z Z IP OLUVFLHQFHFRP &RUW] 0 RQWKO DVS["IG $ FFHVVHG-DQXDU DQG2 FWREHU

BBBBBB %DUUHFN&RUW] +RUVH&UHHN0 HWHURORJLFDO DW$ QQXDOVXP P DU GDW $ YDLODEOHDWZ Z Z IP OLUVFLHQFHFRP $ FFHVVHG2 FWREHU

,QWHUP RXQWDLQ 6RFLHW RI $ P HUIFDQ) RUHVWHUV ,6$) *Management of Pinyon-Juniper "Woodland" Ecosystems* $ 3RVLWRQ RI WKH ,QWHUP RXQWDLQ 6RFLHW RI $ P HUIFDQ) RUHVWHUV) HEUXDU

,WWFD +\GURORJLF 6WHW7HWWRI * 5: DQG: ILORZ 6SUQJV: HQV±' DW 6XP P DU $ QDOVLV DQG' LVFXVLRQ $ XJ XW

BBBBBB * 5: 3XP SLQJ 7HWW DW$ QDOVHV DQG6XP P DU RI)LQGLQJV 0 D\

. HLQDWK ' $ DQG0 0 F* HH 6SHFLHV$ VWHVP HQWRU3\ J P \ 5 DEELW*Brachylagus idahoensis* LQ: \ RP LQJ 3UHSDUHG IRU%XUHDX RI / DQG0 DQDJ HP HQW: \ RP LQJ 6WDWH 2 IIIFH &KH HQQH : \ RP LQJ 0 DUFK S

. OXW ' 6 / : $ \ HLV 0 7 * UHHQ : + + RZ H 6 - -RQHV - $ 6KDIIHU 6 5 6KHIIHOG DQG7 6 =IP P HUP DQ 6WDXV$ VWHVP HQWDQG &RQVHUYDWRQ3DQIRU VWH: HVWUQ%XUURZ LQJ 2 Z OLQ VWH8 QLWG6 WDWV 8 6 ' HSDUW HQWRI ,QWHUIRU) LVK DQG: LOGOLIH6HUYLFH %IRORJ LFDO7 HFKQLFDO3 XEOLFDWRQ) : 6 %73 5 : DVKLQJ WRQ ' &

/ DQGHU&RXQW / DQGHU&RXQW 3RQF\ 3DQIRU) HGHUDO) $ GP LQLVWUHG/ DQGV

/ DUXFHD (6 DQG3) %UXWDUG + DEITWWHOHFWRQ DQG FXUHQWGLVWUEXWRQ RI WKH S\ J P \ UDEELWQ1 HYDGD DQG &DOLRUQLD 8 6$ -RXUQDORI 0 DP P DORJ \

0 F$ GRR . % 6FKXOW 6 6Z DQVRQ DQG* %DFN 1 RUWKHDVWHUQ1 HYDGD: LOGLIHV 3DW ± ITLHDQG/ DQG 8 VH+ LWRU 8 QLYHUVLW RI 1 HYDGD&RRSHUDWLYH ([WHQVRQ) DFW6KHHW

0 LODU& , DQG5 ' : HWDOO ' LVWUEXWRQ DQG &OP DWF 5 HDWRQVKLSVRI WKH $ P HUFDQ3 IND *Ochotona princeps* LQ WKH6 IHUD1 HYDGD DQG: HWWLQ* UHDW%DVLQ 6 $ 3HUJ OFLDO/ DQGIRUP VDV5 HXJ LDIQ: DUP LQJ &OP DWV $ UWF $ QWUFWF DQG $ GSLQH5 HVHDUFK 9 RO 1 R SS 8 6' $) RUHVW6 HUYLFH 3DFLIIF 6RXWKZ HVW5 HVHDUFK 6 WDWRQ 6 IHUD1 HYDGD5 HVHDUFK &HQWU %XFKDQDQ6 WUHHW : HWWLQ$ QQH[%XLGLQJ $ GEDQ &DOLRUQLD 8 6 $

1 DWRQDO &RQIHUHQFH RI 6 WDWH / HJ LVODWXUHV *Nevada: Assessing the Costs of Climate Change* KWW FIHUXP G HGX FOP DWDGDS WDWRQ&OP DW FKDQJH 1 (9 $ ' $ SGI

1 DXUDO5 HVRXUFHV&RQVHUYDWRQ6 HUYLFH 1 5 &6 D 6RLO6 XUYH * HRJ UDSKIF 668 5 * 2 GDWEDVHIRU(XUHND&RXQW $ UHD 1 HYDGD 1 9 6XUYH $ UHD9 HUWRQ * ,6 GDWGDWG 1 DXUDO5 HVRXUFHV&RQVHUYDWRQ6 HUYLFH 8 QLWG6 WDWV' HSDUW HQWRI $ J UIFXOXUH) RUW RUW 7 H[DV $ YDLODEOHDW KWW Z HEVRLOXUYH QUFVJ RY

BBBBB E 6RLO6 XUYH * HRJ UDSKIF 668 5 * 2 GDWEDVHIRU/ DQGHU&RXQW 1 HYDGD 1 RUWK3DW1 9 6XUYH $ UHD9 HUWRQ * ,6 GDWGDWG 1 DXUDO5 HVRXUFHV&RQVHUYDWRQ6 HUYLFH 8 QLWG6 WDWV' HSDUW HQWRI $ J UIFXOXUH) RUW RUW 7 H[DV $ YDLODEOHDW KWW Z HEVRLOXUYH QUFVJ RY

%DUUFN+&&8(3 3DQRI2SHUDWRQV0RGLIFDWRQ$GGHQGXP DQG$PHQGPHQW($

BBBBB (FRORJLFDO6LWH'HVFULSWRQV 1DWXUDO5HVRXUFHV&RQVHUYDWRQ6HUYLFH
$FFHVVHGRQ0DU $YDLODEOHDW
KWWS ZZZ QUFVXVGDJRY ZSVSRUWDOQUFVP DLQQDWRQDOWFKQLFDOHFRVFLHQFHGHVF

1DWXUHVHUYH $FFHVVHG1RYHPEHU $YDLODEOHDW
KWWS H[SORUHUQDWXUHVHUYHRU VHUYOHW DWXU6HUYH'VHUFK1DPH(URJRQXP EHDWH
\DH

1HHO/ $ 1HYDGD%LUG&RQVHUYDWRQ3DQ 5HQR 1HYDGD3DUWQHUVLQ)OLJKW S

1HYDGD%DW RUNLQJ*URXS 1%&* 7KH5HYLVHG1HYDGD%DW&RQVHUYDWRQ3DQ
S

1HYDGD'HSDUW HQWRI$JULFXOWXUH 1'$ 1HYDGD1R[IRXV:HHG/LW1HYDGD
'HSDUW HQWRI$JULFXOWXUH$FFHVVHGRQ0DU $YDLODEOHDW
KWWS DJULQY JRY3DQQW R[IRXV:HHGV1R[IRXV:HHG/LW

1HYDGD'HSDUW HQWRI(PSOR\PHQW7UDLQLQJ DQG5HKDELOLWDWRQ 1'(75 D 1HYDGD
:RUNIRUFH,QIRUP HU 1HYDGD&RYHUHG(PSOR\PHQW$FFHVVHG $SULO
$YDLODEOHDWKWWS ZZZ QHYDGDZ RUNIRUFHFRP DVSGRVQHWWHDUFK DG6HDUFK DVS

BBBBB E 1HYDGD:RUNIRUFH,QIRUP HU /RFDO$UHD8QHP SOR\PHQW6WDWXWFV
1HYDGD/DERU)RUFH5HSRUW$FFHVVHG $SULO $YDLODEOHDW
KWWS ZZZ QHYDGDZ RUNIRUFHFRP

1HYDGD'HSDUW HQWRI:LOGOLIH 1'2: *UHDWHU6DJH*URXVH&RQVHUYDWRQ3DQIRU
1HYDGDDQG(DVWHUQ&DOLIRUQLD)LUWHGWRQ 1'2: -XQH S

BBBBB *,6YHFWRUDO\HU³1'2: B0XOH HHUB' LWWHXWRQB ´ $FTXLUHG)HEUXDU
IURP &KHV9DQ' HOHQ *,6&RRUGLQDWRU 1'2:

BBBBB *,6YHFWRUDO\HU³1'2: B3URQJKRUQB' LWWHXWRQB ´ $FTXLUHG)HEUXDU
IURP &KHV9DQ' HOHQ *,6&RRUGLQDWRU 1'2:

BBBBB *UHDWHU6DJH*URXVH+DELWDW&DWJRU]DWRQ5HYLVHG: KLWW3DSHU -XO

BBBBB /HWWHUUHVSRQVHIURP 7 +HUUIFNRI 1'2: WR: 5IHWKRI7HWD7HFK5H +RUVH
&DQ\RQ&RUW] ([SORUDWRQ $SULO

1HYDGD'LYLVRQRI(QYLURQP HQWDO3URWHFWRQ 1'(3 *HQHUDO6WRUP Z DWU3HUP LW
195

BBBBB D 1HYDGD :DWU4XDOW,QWHUDWG5HSRUW$VVHVVP HQW3HURG±2FWREHU
WKURXJK6HSWP EHU 1'(3 %XUHDXRI:DWU4XDOW3DQQLQJ
&DUVRQ&LW 19 $SULO S

%DUUFN + & &8 (3 3QQ RI 2 SHUDWRQV0 RGLIIFDWRQ $ GGHQGXP DQG $ P HQGP HQW($

BBBBBB E &QDW,, $ ILU4 XDOLW 2 SHUDWQJ 3HUP LW$ 3) HEUXDU

1 HYDGD' LYLVRQ RI : DWU3QQQLQJ 1 ' : 3 1 HYDGD6 WDWH: DWU3QQ 1 ' : 3
' HSDUW HQW RI &RQVHUYDWRQ DQG 1 DWXUDO5 HVRXUFHV 0 DUFK S

1 HYDGD' LYLVRQ RI : DWU5 HVRXUFHV 1 ' : 5 6 WDWH(QJLQHH¶V+ \ GURJUDSKLF %DVLQ
%RXQGDULHV 9 HFWRU*,6 GDWDHW' DWG 6HSWP EHU

1 HYDGD 1 DWXUDO + HUWDJH 3URJUDP 1 1 + 3 6SHFLHV IQIRUP DWRQ Z HE GDWDEDVH
$ YDLODEOH KWW KHUWDJHQY J RY VSHFLHVBLQIR

3HUVRQ) % - ' %DWV 7 - 6YHWDU DQG 6 3 + DUGHJUHH *Runoff and Erosion After Cutting Western Juniper* 5 DQJHODQG(FRORJ\ 0 DQDJHP HQW

3HUVRQ) % & - : LOOLDP V 3 5 . RUP RV 6 3 + DUGHJUHH 3 (&QDUN DQG % 0 5 DX *Hydrologic Vulnerability of Sagebrush Steppe Following Pinyon and Juniper Encroachment* 5 DQJHODQG(FRORJ\ 0 DQDJHP HQW

3HUVRQ) % & - : LOOLDP V 3 5 . RUP RV DQG 2 = $ O+ DP GDQ *Hydrologic Response of Sagebrush Steppe to Woodland Encroachment and Subsequent Tree Removal: Implications for Assessing Sagebrush Steppe Hydrologic Stability and Resiliency* ,Q $ EWUDFW RI WKH WK $ QQXDO 0 HHWQJ RI WKH 6RFLHW IRU 5 DQJH 0 DQDJHP HQW6SRNDQH : $

5 HG . ' % 3 : LOOR[' ' %UHWKHDV DQG/ 0 DF' RQDOG *Runoff and Erosion in a Pinyon-Juniper Woodland: Influence of Vegetation Patches* 6RLO6FLHQFH

5 RJHUV 6 ' DQG0 0 3HDFRFN 7KHGLVSSHDUDQ QRUWKHUQ0HSDUGIURJ *Lithobates pipiens* FRQVHUYDWRQJHQHWFVDQGIP SOLFDWRQVIRUUHP QDQWSRSXODWRQVIQ Z HVWUQ 1 HYDGD (FRORJ\ DQG(YROXWRQ SS

6P LWK(QYLURQP HQWDO (QJLQHHULQJ 60 ,7 + 6RLOV,QYHVWJDWRQ RI WKH+ RUVH &DQ\RQ &RUW] 8 QLLIHG([SORUDWRQ 3URMFW3QQ RI 2 SHUDWRQV$ UHDIQ(XUHND&RXQW DQG/ DQGHU&RXQW 1 HYDGD S SOXVDSSHQGLFHV

6SLVJ . DQG- 0 RUHQR $ 3UDFWFDO* XLGHWK* URXQGZ DWUDQG6 ROXW7 UDQVPRUW 0 RGHOQJ -RKQ: LOH 6RQV 1 HZ < RUN S

65. &RQVXOWQJ ,QF 65. + RUVH&DQ\RQ0 ILQH6WRUP Z DWU3 ROXWRQ3 UHYHQWRQ 3QQ $ SULO(ONR 1 HYDGD

6WZ DUW- + * HRORJ\ RI 1 HYDGD DGLVFXVWRQ WK DFFRP SDQ\ WKHJ HRORJ IF P DS RI 1 HYDGD 1 HYDGD%XUHDX RI 0 ILQHVDQG* HRORJ\ 6SHFLDO3 XEOLFDWRQ

7 HWD7 HFK + RUVH&DQ RQ&RUW] 8 QLIIHG([SORUDWRQ3URWRFW: ILOOLH%DVHOLQH
5 HSRUW3UHSDUHG IRU%XUHDX RI / DQG0 DQDJ HP HQW%DVHOH0 RXQWDLQ' LVWUFW2 IIIFH
0 RXQW HZ LV) IHOG2 IIIFH -XO S

8 QLWG 6WDWHV&HQVXV%XUHDX 8 6 &HQVXV%XUHDX &HQVXVRI 3RSXODWRQ
9 RXP H &KDUDFWHULVWFVRI WKH3RSXODWRQ&KDSWHU$ 1 XP EHURI ,QKDELWDQWV3DUW
1 HYDGD3& $ 8 6 ' HSDUW HQWRI &RP P HUFH %XUHDX RI WKH&HQVXV
3RSXODWRQ' LYLVRQ 7DEOH 3RSXODWRQRI 3ODFHV WR $ FFHVVHG -XQH
$ YDLODEOHDWKWWS Z Z Z FHQVXVJ RY SURG Z Z Z GHFHQLDOKW O

BBBBB D &HQVXVRI 3RSXODWRQ DQG+ RXVLQJ 7DEOH 3RSXODWRQ DQG+ RXVLQJ
8 QLW $ FFHVVHG $ SUL $ YDLODEOHDW
KWWS Z Z Z FHQVXVJ RY SRSXODWRQ Z Z Z FHQVXVGDWDKLVFHQGDWDKW O

BBBBB E &HQVXVRI 3RSXODWRQ DQG+ RXVLQJ 3XEOF / DZ ' DWD 2 IIIFLDO
$ J HE\ 5 DFHDQG+ LVSDQLF 2 UJ LQ $ FFHVVHG -XQH $ YDLODEOHDW
KWWS FHQWDWVFHQVXVJ RY

BBBBB D &HQVXV([SORUHU &HQVXV 7 RWO3RSXODWRQ E\ 6WDWHDQG &RXQW
$ FFHVVHG $ SUL DQG0 D\ $ YDLODEOHDW
KWWS Z Z Z FHQVXVJ RY FHQVXVH[SORUHUKW O

BBBBB E 8 6 &HQVXV ' HP RJ UDSKF 3URILOHV 7DEOH' 3 3URILOHRI * HQHUDO
' HP RJ UDSKF &KDUDFWHULVWFV * HRJ UDSKF DUHD %DVHOH0 RXQWDLQ&' 3 (ONR
&LW 6SULQJ &UHHN&' 3 DQG&DOLQ&LW 1 HYDGD $ FFHVVHG $ SUL
$ YDLODEOHDWKWWS FHQWDWVFHQVXVJ RY

BBBBB &HQVXV,QWHUFWXH3RSXODWRQ6HDUFK $ FFHVVHG $ SUL DQG
0 D\ $ YDLODEOHDWKWWS Z Z Z FHQVXVJ RY FHQVXVSRSP DS ISP W[WSKS

BBBBB 1 HYDGD4 XIFN) DFWIURP WKH8 6 &HQVXV%XUHDX $ FFHVVHG -XQH
$ YDLODEOHDW KWWS TXIFNIDFWFHQVXVJ RY TIG WDWHV KW O
8 QLWG 6WDWHV(QYLURQP HQWDO3URWFWRQ$ J HQF\ 8 6(3$ 1 DWRQDO$ P EIHQW
$ ILU4 XDOW 6WDQGDUGV 1 $ $ 4 6 $ YDLODEOHDWKWWS HSDJ RY DLUFUWUDKW O

8 QLWG 6WDWHV(QYLURQP HQWDO3URWFWRQ$ J HQF\ 8 6(3$ 1 DWRQDO$ P EIHQW$ ILU
4 XDOW 6WDQGDUGV 1 $ $ 4 6 $ FFHVVHG-XQH $ YDLODEOHDW
KWWS HSDJ RY DLUFUWUDKW O

BBBBB : DWWV± + DJ DUGRXV: DWWDQG 1 RQ + DJ DUGRXV: DWW $ FFHVVHG RQ 0 D\

%DUUHFN+&&&8(3 3DQRI2SHUDWRQV0RGLIIHDWRQ$GGHQGXP DQG$PHQGPHQW($

$YDLODEOH DWKWWS ZZZ HSDJRY HSDZ DVDMKD]DLG LQGH[KWP DQG
KWWS ZZZ HSDJRY HSDZ DVDMQRQKD] LQGH[KWP

8QLWHG6WDWHV)LVKDQG:LOGOLIH86):6 $SSHQGL[*in* $ %&XHSULQWVRUWKH)XWXUHRI
0LJUDWRU\%LUGV0LJUDWRU\%LUG3URJUDP 6WDWH&RPSUHKHQVLYH3DQ 86):6
0LJUDWRU\%LUG3URJUDP S

BBBBB %LUGVRI&RQVHUYDWRQ&RQFHUQ 8QLWHG6WDWHV'HSDUWPHQWRI,QWHULRU
)LVKDQG:LOGOLIH6HUYLFH'LYLVLRQRI0LJUDWRU\%LUG0DQDJHPHQW$GDSWLYH
9LUJLQLD S

BBBBB (QGDQJHUHG DQG7KUHDWHQHG:LOGOLIHDQG3ODQWV P RQWK)LQGLQJ VIRU
3HWLWLRQVWR/LVWWKH*UHDWHU6DJH*URXVH *Centrocercus urophasianus* DV7KUHDWHQHG
RU(QGDQJHUHG 3URSRVHG5XOH)HGHUDO5HJLVWHU 0DUFK

BBBBB /HWWHUUHJDUGLQJ /LVWRI WKUHDWHQHG DQG HQGDQJHUHG VSHFLHV WKDW P D\ RFFXULQ
\RXUSURSRVHG SURMHFW&RFDWRQ DQG RUP D\ EHDIIHFWHG E\ \RXUSURSRVHG SURMHFW
%DUUHFN+&&&8(3(\$ 3URMHFW&RQVXOWDWRQ7UDFNLQJ 1XP EHU (19' 6/,
0DUFK

8QLWHG6WDWHV* HRORJLFDO6XUYH\ 86*6 1DWRQDO&: DWHU,QIRUP DWRQ6\VWHP GDW
DYDLODEOH RQWH: RUOG: LGH: HE 86*6: DWHU' DWDIRUWKH1DWRQ $FFHVVHG0D\
$YDLODEOH DWKWWS Z DWHUGDWDXVJVJRY QY QZ LVXY

86 * HRORJLFDO6XUYH\ 86*6 (QYLURQP HQWDO3URWHFWRQ$JHQF\ (3$ 1DWRQDO
+\GURJUDSK\ ' DWDWHWRU1HYDGD 9HFWRU*,6 GDWD $FFHVVHG $YDLODEOH
KWWS GDWDXDWZ D\ QLFVXVGDJRY

8QLYHUVLW RI1HYDGD±5HQR 815 0/5$ GHWHUPLQDWRQV UHFHLYHG IURP ' HYRQ6Q\GHU
815 YLD%DUUHFNHP DLO$SULO

:HOVDQG(OORW *HRFKHP LFDO5HFRQQDLVVDQFHRI WKH&RUW] %XFNKRUQ$UHD
6RXWKHQ&RUW] 0RXQWDLQV1HYDGD 86 *HRORJLFDO6XUYH\ %XOOHWLQ 3

:LOGOLH$FWRQ3ODQ7HDP :$37 1HYDGD:LOGOLH$FWRQ3ODQ 1HYDGD
' HSDUWPHQWRI :LOGOLH5HQR 1HYDGD 6XEP LWWHG6HSWHP EHU $SSURYHG
0DUFK

:HVWHUQ5HJLRQDO&OP DWH&HQWHU: 5&&& *Beowawe U of N Ranch, Nevada Period of Record Monthly Climate Summary: September 1972 to January 2013* 5HQR 1HYDGD
KWWS ZZZ ZUFF GUHGX FJLEIQFOD $,1 SC'QY

=RQHV&3 *URXQG Z DWHU3RWHQWDO0DSSLQ WKH&UHHFHQW9DOOH\ (XUHND&RXQW\ &RXQWLHV1HYDGD 86 *HRORJLFDO6XUYH\ 86*6: DWHU6XSSO\3DSHU 86
*RYHUQP HQW3ULQWLQJ2IIIFH: DVKLQJWRQ'&&SS

0DUFK

$ SSHQGL &
&8 (3
6XUDFH
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Horse Canyon/Cortez Unified Exploration Project Surface Disturbance and Reclamation Survey Protocol

Prepared by
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May 2013

Horse Canyon/Cortez Unified Exploration Project Surface Disturbance and Reclamation Survey Protocol

This protocol addresses general survey procedures for disturbance activities conducted within the HC/CUEP Plan boundary related to construction and reclamation activities performed by BGEI.

- New surface disturbance is requested by drill services and Project Geologist to drill services surveyor.
- Drill services surveyor plots surface disturbance on map and gets approval from Environmental Compliance Representative about disturbance location.
- Environmentally sensitive areas are identified in the field and avoidance zones noted on the disturbance permit, and if needed flagged in the field.
- Construction activities are monitored by drill services supervisors and or designated representative to ensure compliance to the plan.
- Monthly disturbance data are collected with Trimble GeoExplorer 6000 Series (GeoXH) handhelds or similar survey equipment by the Drill Services surveyors and sent to the GIS database manager.
- Data are surveyed in WGS 84 and then converted to the Barrick Regional Survey Grid which is a local grid reference to NAD 83.
- The perimeters of the disturbance areas are walked with GPS units; a point is collected every second and the cumulative point data are then converted into polylines in a GIS platform.
- The data are post-processed with a Trimble GPS Pathfinder Office software or similar processing software to obtain ≤10-centimeter accuracy.
- The GIS database manager compiles the active and open disturbance acreage and submits the monthly disturbance report summarizing acreage disturbance for the month, total project disturbance, and reclaimed acres to the Chief Geologist, project managers and senior drill supervision.
- Road dimensions are captured in the field as polylines with a GPS measuring from the crest of the cut to the toe of the fill. Pad/sump dimensions and total fill area are surveyed in the field.
    - The number of open holes and pads are collected each month.
    - The number of culverts is verified each month.
    - BGEI conducts an annual reconciliation of disturbance using aerial photography to ensure that all disturbances have been captured.
    - Disturbance is reported on an annual basis to the BLM and NDEP by April 15 of each year.

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%0 3VIRUHURVLRQFRQWUROXVHGDWWKHSURMHFWDUHDLQFOXGHSUHPLXDWRQRI H[LWQJ YHJHWDWRQ WR WKHH[WQVSRWLEOH UHFRQWRXULQJ UHYHJHWDWRQ UISUDS YHORFLW GLVWSDWRQGHYLFHV DQG GLWKHV 6SHFLILF HURVLRQ%0 3VIRUWKHSURMHFWDUHDLQFOXGH

- :DWWUURFNSLOHVDWWKHSURMHFWDUHDKDYHEHHQUHFRQWRXUHGDQGUHYHJHWDWG
- 5RDGVLQWKHSURMHFWDUHDDUHFDQWG WRZDUG GLWKHVZKLFKUXQWKHOHQJWK RI WKHURDG
- :DWUXVHGIRUGXWFRQWUROVVSUDYHGRYHUURDGVDQG GLWXUEHGDUHDVDWDUWWKDW P RLWWQVWKHVRLOEXWGRHVQRWFDXVHUXQRII SUHYHQWQJ ZLQGHURVLRQ
- 9HORFLW GLWSDWRQGHYLFHV EHP FXWRXW DUHXVHG WKURXJKRXWWKHURDGVDWWKHSURMHFW DUHDWR GLYHUWWRUP ZDWUJQWRQDWXUDOGUDLQDJHVDQG P LQLP LJHH[SRVXUHWR GLWXUEHG VRLO
- 6LOWHQFHV WWDZ EDOHV GLWKHV DQG VHGLP HQWEDQQV IRUDOOGRZQVORSHERXQGDUHVRI FRQWXXFWRQ DUHDVDQG VLGHVORSHVDVGHHP HGDSSURSULDWHE\ LQGLYLGXDOWLWFRQGLWRQVDUH LQWXOHG DQG ZLOOP DLIP LJHWKHDP RXQWRI VHGLP HQWWKDWVWDSSHG
- 6WRUP ZDWUJVGLYHUWG DZDY IURP P DWUJDOWRUJHDUHDV
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- 5HFOP DWRQRI WKH+RUVH&DQ\RQ&RUW] 8QLIHG([SORUDWRQ3URMHFWV SHUURP HGSXUXXDQWR3HUP IW LWXHGE\ WKH1HYDGD' LYLVRQRI (QYLURQP HQWDO3URWHFWRQ%XUHDXRI 0LQLQJ DQG5HFOP DWRQDQG WKH%XUHDXRI /DQG0DQDJHP HQW5HFOP DWRQRI WKH: HVW3LQH9DOOH\ ([SORUDWRQ3OQQLV SHUURP HGSXUXXDQWR3HUP IW

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BMP	Description and Use
6 OR SH 7 HUDFLQJ DQG 7 UDFNLQJ	7 HUDFLQJ DQG VRLOURXJ KHQLQJ RUWDFNLQJ RI VORSHV UHGXFHV HURVLRQ E\ FUHDWLQJ WHUUDFHV WKDW VORZ VDFURVV VORSHV DQG VHUDWRQVLQ WKH VRLO 8 QHYHQ EDUH VRLO VXUDFHV FDSWXUH UDLQGURSV GHFUHDVH WKH YHORFLW RI UXQ RII WUDS VHGLP HQW LQFUHDVHLQLQWDWRQ DQG DLG LQ WKH HVWEOLVKP HQWRI YHJ HWDWRQ 7 HUDFLQJ DQG VRLO URXJ KHQLQJ RUWDFNLQJ RI VORSHVP D\ EHQHFHFHVDU RQ WKH VORSHVLQ WKH VRXWHQ SRUWRQ RI WKH SURMHFWLW
: LQG (URVLRQ DQG ' XVW &RQWUROO	' XVWFRQWUROP HDVXUHVZ LOOEH SURYLGHG *as necessary* WR SUHYHQWRUDOOHYLDWH GXVW QXLVDQFHDQG FRP SOY Z LWK UHJ XODWRQV &RQWUROP D\ FRQVLVWRI DSSOYLQJ Z DWU VRLOWEIOD] HVV RUGXWSDOOLWHV 66 7 KHDSSOFDWRQ RI Z DWUYLDD Z DWU WXFNLVD WSIFDOGXWFRQWUROP HDVXUH &DXWRQ P XWEH WDNHQ WR SUHYHQWZ DWU DSSOFDWRQVLQ H[FHVVRI VRLOEVRUSWRQ UDWV 2 WKHZ LVH WKHH[FHVVZ DWUFRXOG UHVXOWLQ VHGLP HQWDGHQ UXQ RII
5 ISUDS	5 ISUDS P HDVXUHVDUHWR EHSURYLGHG DWWKH VRUP GUDLQ RXOHWRUVRLOWEIOD] DWRQ DQG WR SUHYHQWRLOHURVRQ IQ DUHDVRI FRQFHQWDWG UXQ RII
6 ILOWHQFHV VORZ DQG GHWLQ VHGLP HQWDGHQ VKHHWORZ IURP GLWXUEHG DUHDVDQG DOORZ VHWWOP HQWRI VHGLP HQWSURUWR GLVFKDJ HRII VLWH + RZ HYHU VLOWHQFHV UHTXLUHP RUHP DLQWDQFHDQG P XWEH UHP RYHG XSRQ FRP SOHWRQ RI WKH SURMHFW $ VLOWHQFHP D\ EHLQWWOHG WR SURWHFWWKH H[LWQJ EDVLQ DQG GUDLQDJ HV
6 WRFNSLOHV P XWEH ORFDWG IHHWZ D\ IURP WWHP IQOHWV DQG Z DWUFRXUHV WKDWFDQ FRQYH\ VHGLP HQW 6 HGLP HQWORJ V VKRXOG EH SOFHG DURXQG WKH SHUP HWU RI HDFK DQG HYHU WRFNSLOHWR SUHYHQWWHGLP HQWP RYHP HQWURP GHMJ QDWG DUHDV
6 ROG DQG ' HP RODWRQ : DWW	' HMJ QDWRQ VLWZ DWWFRQOHFWRQ DUHDVDZ D\ IURP WWHP IQOHWV &RYHU GXP SWWLVDWDOOWP HV &RQOHFWFRQWXXFWRQ VLWOOWWUDQG GHEUVGLO
6 SLOOB UHYHQWRQ	' IVFKDJ HVRI QRQ KD] DUGRXVDQG KD] DUGRXVP DWUDOVFDQ EH HOP IQDWG E\ SUHYHQWQJ DQG FRQWROOQ VSLOOV &RQWFFWRUVDUHUHVRQWEOHHIRUXWOD] IQJ GUS SDQVRUDEVRUEHQWP DWUDOXQGHUHTXLSP HQWZ KHQ IWVQRWQ XVH P DIQWQIQJ D WRFNSLOHRI VSLOOFOHDQ XS P DWUDOVORFDWG Z KHUHIWZ IOOEH UHDGLO DFFHVWEOH DQG IRUIP P HGLDWFOHDQ XS RI VSLOOVDQG SURSHUGLVSRVDORI VRLOVDQG P DWUDOV

BMP	Description and Use
9 HKLFOH (TXLSP HQW 0 DLQWDQDQFH) XHODQ	) XHODQ DQG P DLQWDQDQFH DUHDV VKRXOG EH ORFDWHG DWOHDVW IHHWURP DQ\ Z DWHUZ D\ SURWHFWHG IURP DQ\ DEOHDW RI FRQYH\ DQFH RI SRORXWDQW ORFDWHG RQ D OHYHO JUDGH : DVKLQJ IXHODQ DQG DQ\ P DWHUP DLQWDQDQFH VKRXOG EH FRQGXFWHG RII VLWH Z KHQHYHU SRVVLEOH
0 DWULDO ' HOLYHU\ DQG 6 WRUDJH	: DWHULDO WKH FRQWXFWRQ WDOLQJ DUHD WKH FRQWUFWRUZ LOO GHMJ QDWHD VWRUDJH DUHD DZ D\ IURP DVWRUP Z DWHUFRQYH\ DQFH IRUWKH GHOLYHU\ KDQGOLQJ DQG VWRUDJH RI P DWHULDOV 0 DWHULDOV VXEMHFWWR Z LQG HURVLRQ DQG Z HDWKHUZ LOOEH VWRUHG Z LWKLQ D FRYHUHG FRQWDLQHU
3 DLQWDQG / LTXLG 0 DWHULDOV	$ VSHFLLIF VWRUDJH DQG FOHDQLQJ DUHD VKRXOG EH GHMJ QDWHG WR P LQLP L] HRU HDP LQDWWKH WDQVSRUWRI SDLQWDGKHMLYHV VROYHQW DQG FOHDQLQJ SURGXFWVWR VWRUP GUDLQVRUZ DWHUFRXUHV
6 DQLWDU\ 6HSWF : DWH 0 DQDJHP HQW	$ COVDQLWDU\ VHSWF Z DWHUDFLOWHV SRUWEOHUHWRRRP V P XWEHSOLFHG DWOHDVW IHHWURP VXUFHZ DWHU 7 KHIDFLOW P XWEHORFDWHG LQ DQ DUHD Z KHUHII WSSSHG RYHU LWZ LOOQRWOORZ FRQYH\ DQFHRI VHSWF LOXLGVDQG Z DWHULQWR WKH VXUFHZ DWHUV\ WWP 7 KHIDFLOW VKRXOG EHDQFKRUHG GRZ Q WR SUHYHQWWKHP IURP RYHUWXUQLQJ GXULQJ SHUGVRI KLJ K Z LQG) IEHURRQV VKRXOG EHSOLFHG DURXQG WKH IDFLOW 7 KHIDFLOW VKRXOG EHGLVFKDUJ HG LQWR DVDQLWDU\ VHZ HU QRWWKH WRUP GUDLQ V\ WWP 7 KHIDFLOW VKRXOG EHP RQLWRUHG IRUOHDNVDQG JRRG Z RUNLQJ RUGHU DWOHDWRQFHDZ HHN
/ DQGVFDSH 0 DQDJHP HQW	$ VSHFLLIF VWRUDJHDUHDIRUSODQWWRUDJH ODQGVFDSLQJ WRSVRLO DQG FKHP IFDOV VKRXOG EHGHMJ QDWHG WR OP LWWKHGLVFKDUJ HRI VRLOV IHUWLOLHUV DQG FKHP IFDOVLQWR WRUP GUDLQVDQG J XWHUV GUDLQDJ HV DQG Z DWHUFRXUHV
1 R[IRXV: HHG &RQWURO	0 DQ\ LQYDVLYHSODQWDUHOWHG DVQR[IRXVZ HHGVLQ WKH1 HYDGD5 HYLVHG6 WDWXWV &RQVHTXHQW WKHUFRQWROORUP DQDJHP HQWLVP DQGDWHE\ ODZ &RQWXFWRQ SUDFWFHVDUHDNQRZ Q FDXVHRI WKHVSUHDG RI LQYDVLYHZ HHGV 6KRXOG WKH VLWHKDYH LQYDVLYHZ HHGV DSSOFDWRQ RI KHUEIFLGHRUP DQXDOO XSURRWQJ WKHLQHWWRQ LV UHFRP P HQGHG * UHDWFDUH VKRXOG EH WDNHQ WR WW RXWRI LQHWWG DUHDVZ LWK YHKIFOHVDQG P DNHVXUH YHKIFOHVDUHI UHRI GLWDQG GHEULVZ KHQ HQWULQJ DQG H[LWQJ WKH VLWH WR QRWFDUU VHHGVDQG SODQWSIHFHVWR RUI URP WKHFRQWXFWRQ VLWH
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Table B-1. All 2013 Seep/Spring Monitoring and Sampling Sites

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
	26-48-23-211A	539894	4440606	No water present; no sample collected
	26-48-23-211B	539988	4440565	No water present; no sample collected
	26-48-23-242	540498	4440151	No water present; no sample collected
	26-48-23-313A	539016	4439706	No water present; no sample collected
	26-48-23-313B	539046	4439673	No water present; no sample collected
	26-48-24-133	540675	4440070	No water present; no sample collected
	26-48-24-134	540818	4439991	No water present; no sample collected
	26-48-26-123A	539518	4438802	No water present; no sample collected
	26-48-26-123B	539478	4438843	No water present; no sample collected
	27-48-22-222A	538848	4450203	Physical parameters measured did not exceed NDEP reference values and were consistent with the physical parameters of other monitoring locations in this area. All concentrations of anions and cations at this location were detected within NDEP reference values. The following dissolved metals exceeded their respective reference limit: dissolved arsenic 0.073 mg/L; dissolved iron 1.10 mg/L; Total recoverable iron 2.66 mg/L; all other total recoverable metals were reported within reference values.
	27-48-23-234	540081	4449548	No water present; no sample collected
	27-48-35-112	538979	4446871	Water flow was too low to be measured. All concentrations of anions, cations, and dissolved metals were reported within NDEP Profile II reference values. The following constituents of total recoverable metals exceeded reference values: total recoverable aluminum 0.82 mg/L; total recoverable iron 1.46 mg/L; and total recoverable manganese 0.10 mg/L.
	27-48-14-343	539549	4450385	Not added to monitoring program (not a wetland)

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
	27-48-23-133	539073	4449556	Not added to monitoring program (not a wetland)
	27-48-23-143	539463	4449546	Not added to monitoring program (not a wetland)
	27-48-23-144	539615	4449580	Not added to monitoring program (not a wetland)
	27-48-23-144A	539553	4449574	Not added to monitoring program (not a wetland)
	27-48-23-424	540372	4449119	Not added to monitoring program (not a wetland)
	27-48-23-441	540286	4448984	Not added to monitoring program (not a wetland)
	27-48-26-143	539482	4448017	Not added to monitoring program (not a wetland)
	27-48-26-312	539238	4447858	Not added to monitoring program (not a wetland)
	27-48-26-312A	539210	4447810	Not added to monitoring program (not a wetland)
	27-48-26-314	539223	4447620	Not added to monitoring program (not a wetland)
	27-48-26-324	539612	4447506	Not added to monitoring program (not a wetland)
	27-48-26-324A	539624	4447514	Not added to monitoring program (not a wetland)
	27-48-26-324B	539634	4447553	Not added to monitoring program (not a wetland)
	27-48-26-324C	539636	4447558	Not added to monitoring program (not a wetland)
	27-48-26-324D	539631	4447564	Not added to monitoring program (not a wetland)
	27-48-26-342	539653	4447442	Not added to monitoring program (not a wetland)
	27-48-26-411	539759	4447740	Not added to monitoring program (not a wetland)
	27-48-27-423	538741	4447660	Not added to monitoring program (not a wetland)
	27-48-27-423A	538719	4447629	Not added to monitoring program (not a wetland)
	27-48-27-424	538835	4447673	Not added to monitoring program (not a wetland)
	27-48-27-424A	538840	4447651	Not added to monitoring program (not a wetland)
Horse Creek (35 seep/spring sites)				
	26-48-02-322	539752	4444692	No water present; no sample collected

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
	26-48-02-423A	540270	4444287	All physical parameters were detected within NDEP reference values. Water flow was measured at 1.79 gallons per minute (gpm). All concentrations of anions, cations, dissolved metals, and total recoverable metals were reported within NDEP reference values.
	26-48-02-423B	540306	4444308	All physical parameters were detected within NDEP reference values. Water flow was measured at 0.45 gpm. All concentrations of anions, cations, dissolved metals, and total recoverable metals were reported within NDEP reference values and were comparable to the concentrations of other constituents in the area.
	26-48-03-114	537749	4445131	Not sampled due to access limitations
	26-48-03-134	537836	4444877	No water present; no sample collected
	26-48-03-143	537927	4444726	No water present; no sample collected
	26-48-03-213	538428	4445155	No water present; no sample collected
	26-48-03-221	538728	4445377	No water present; no sample collected
	26-48-03-321	538021	4444516	Water flow was measured at 8.96 gpm. All physical parameters were detected within NDEP reference values. All concentrations of anions and cations were reported within NDEP reference values. Dissolved arsenic was reported at 0.011 mg/L, above the reference limit. Concentrations of all other dissolved metals and total recoverable metals were detected within NDEP reference values.
	26-48-03-413A	538239	4444487	No water present; no sample collected
	26-48-03-413B	538254	4444461	No water present; no sample collected
	26-48-03-443	538718	4443956	No water present; no sample collected
	26-48-03-444	538959	4443948	No water present; no sample collected
	26-48-10-142	538066	4443427	The level of TDS detected was 780 mg/L, exceeding the NDEP reference limit. All other physical parameters were within reference values. All concentrations of anions, cations, dissolved metals, and total recoverable metals were reported within NDEP reference values.
	26-48-10-232	538326	4443382	No water present; no sample collected
	26-48-10-344	538113	4442357	No sample collected (spring discharge feature not found, removing and replacing with 26-48-10-433)

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
	26-48-10-433	538163	4442349	There was no significant water flow at the time of monitoring, standing surface water present to collect field parameters and water samples. All physical parameters were detected within NDEP reference values. All concentrations of dissolved metals, total recoverable metals, cations, and anions were reported within NDEP reference values.
	26-48-10-441	538806	4442595	No water present; no sample collected
	26-48-10-442	538878	4442546	No water present; no sample collected
	26-48-10-444	538964	4442428	No water present; no sample collected
	26-48-11-142	539843	4443518	No water present; no sample collected
	26-48-11-144A	540497	4443317	TDS were detected at 510 mg/L, exceeding the NDEP reference limit. No other physical parameters exceeded reference values. All concentrations of anions, cations, and dissolved metals were detected within NDEP Profile II reference values. Dissolved manganese exceeded reference values at 0.28 mg/L. The following constituents of total recoverable metals exceeded reference values: total recoverable aluminum 0.28 mg/L; total recoverable iron 0.35 mg/L; total recoverable manganese 0.25 mg/L.
	26-48-11-144B	540456	4443295	Water flow was too low to be measured; no physical parameters were measured above NDEP reference values. All concentrations of anions, cations, dissolved metals, and total recoverable metals were reported within NDEP Profile II reference values.
	26-48-11-312	539176	4443169	No water present; no sample collected
	26-48-11-422	540521	4442562	No water present; no sample collected
	26-48-12-324	541358	4442817	Water flow was measured at 0.45 gpm, and all physical parameters were detected within NDEP reference values. All concentrations of anions and cations were reported within NDEP reference values. The following dissolved metals exceeded reference values: dissolved aluminum 0.64 mg/L; dissolved iron 2.00 mg/L; dissolved manganese 1.84 mg/L. The following total recoverable metals exceeded reference values: total recoverable aluminum 2.98 mg/L; total recoverable iron 3.95 mg/L; total recoverable manganese

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
				1.98 mg/L.
	26-48-12-341	541303	4442787	Water flow was too low to be measured at this location; all physical parameters were detected within NDEP reference values. All concentrations of anions and cations were reported within NDEP reference values. Dissolved arsenic exceeded the NDEP reference limit at 0.014 mg/L. All other concentrations of dissolved metals were detected within NDEP reference values. All concentrations of total recoverable metals were detected within NDEP reference values.
	26-48-12-414	541816	4442778	Water flow was measured at 0.45 gpm. TDS was detected at 760 mg/L, exceeding NDEP reference values. All concentrations of anions and cations were reported within NDEP Profile II reference values. Dissolved manganese exceeded reference values at 0.58 mg/L. The following total recoverable metals exceeded NDEP Profile II reference values: total recoverable aluminum 0.88 mg/L; total recoverable iron 1.73 mg/L; total recoverable manganese 0.70 mg/L.
	26-48-12-432	541648	4442708	No water present; no sample collected
	26-48-13-323	541243	4441171	No water present; no sample collected
	26-48-13-324	541337	4441184	Water flow was measured at 0.45 gpm. All physical parameters were within NDEP reference values. All concentrations of anions and cations were reported within NDEP reference values. The level of dissolved arsenic reported was 0.031 mg/L and exceeded reference values. All concentrations of total recoverable metals that were reported were within reference values.
	26-48-13-342	541411	4440946	Water flow was measured at 0.04 gpm. TDS exceeded NDEP reference values, measuring 512 mg/L. All other physical parameters were within the reference values. All concentrations of anions, cations, and total recoverable metals were reported within NDEP reference values for these constituents. Dissolved arsenic was reported at 0.026 mg/L, which exceeded the NDEP reference limit.
	26-48-13-431	541500	4441030	Water flow was too low to be measured. TDS was measured at 1,050 mg/L, exceeding the NDEP reference limit. All other physical parameters were within reference values. All concentrations of anions, cations, and total recoverable

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
				metals were reported within NDEP reference values. The concentration of dissolved arsenic was detected at 0.078 mg/L, exceeding the NDEP reference values. All other constituents of dissolved metals were within reference values.
	26-48-13-432	541858	4441074	No water present; no sample collected
	26-48-24-221	541953	4440698	No water present; no sample collected
	27-48-27-134	537769	4447920	Water flow was too low to be measured; all other field parameters were detected within NDEP reference values. All concentrations of anions and cations were detected within NDEP Profile II reference values. The concentration of dissolved arsenic exceeded the reference limit at 0.064 mg/L. All other concentrations of dissolved metals were reported within reference values. The following total recoverable metals exceeded reference values: total recoverable aluminum 0.77 mg/L; total recoverable iron 0.82 mg/L.
	27-48-27-134A	537735	4447980	Water flow was too low to be measured. All concentrations of anions and cations were detected within NDEP Profile II reference values. The concentration of dissolved arsenic exceeded the reference limit and was reported at 0.066 mg/L. All other concentrations of dissolved metals were reported within reference values. The following total recoverable metals exceeded reference values: total recoverable aluminum 4.66 mg/L; total recoverable iron 5.23 mg/L; total recoverable manganese 0.11 mg/L.
	27-48-27-131	537538	4448151	Not added to monitoring program (not a wetland)
	27-48-27-131A	537568	4448105	Not added to monitoring program (not a wetland)
	26-47-11-121	529709	4443797	No sample collected (site confirmed to not be a water feature)
	26-48-01-131	540859	4445063	No water present; no sample collected
	26-48-01-141	541179	4444967	No water present; no sample collected
	26-48-01-212	541713	4445369	No water present; no sample collected

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
	26-48-01-212B	541782	4445320	No water present; no sample collected
	26-48-01-223	541985	4445163	No water present; no sample collected
	26-48-01-234	541796	4444829	No water present; no sample collected
	26-48-02-224	540558	4445180	No water present; no sample collected
	27-48-34-322A	538263	4446041	TDS exceeded reference values and was detected at 2,250 mg/L, and all other physical parameters were detected within NDEP reference values. Magnesium and sulfate levels were detected above NDEP Profile II reference values, measuring 189 mg/L and 1,370 mg/L, respectively. All other concentrations of anions and cations were detected within reference values. All constituents of dissolved metals were reported within reference values. The following constituents of total recoverable metals were detected above reference values: total recoverable aluminum 0.36 mg/L; total recoverable iron 1.12 mg/L; total recoverable manganese 0.11 mg/L.
	27-48-34-322B	538366	4446058	No water present; no sample collected
	27-48-34-412	538532	4446043	No water present; no sample collected
	27-48-34-421	538664	4446079	No water present; no sample collected
	27-48-35-234	539960	4446330	Water flow was too low to be measured. TDS exceeded reference values at 1,140 mg/L; all other physical parameters were detected within NDEP reference values. The concentration of sulfate detected at this location exceeded NDEP Profile II reference values at 657 mg/L. All other anion and cation concentrations were detected within reference values. All constituents of dissolved metals and total recoverable metals were detected within reference values.
	27-48-35-311	539078	4446149	Water flow was recorded at 0.45 gpm. TDS exceeded the reference limit and was detected at 1,950 mg/L, and all other physical parameters were detected within NDEP reference values. The concentration of sulfate detected at this location exceeded NDEP Profile II reference values at 1,240 mg/L. All other anion and cation concentrations were detected within reference values. All constituents of dissolved metals and total recoverable metals were detected within reference values.

Site ID	Site ID	UTM Easting	UTM Northing	Sample collected in 2013/ 2013 Physical and Analytical Sample results (HDR 2014)
Willow Springs (2 sampling sites)				
	26-48-01-313B	540883	4444464	No water present; no sample collected
	26-48-01-323	541090	4444442	No water present; no sample collected

Table B-2. HC/CUEP Wetland Areas[1]

Group	Wetland Site ID	Acres
Dry Hills (8 wetland areas confirmed in 2013)	26-48-23-211A	0.015
	26-48-23-211B	0.01
	26-48-23-242	0.018
	26-48-23-313A	0.009
	26-48-23-313B	0.021
	26-48-24-133	0.006
	26-48-24-134	0.007
	26-48-26-123A / 26-48-26-123B	0.02
Fourmile Canyon (3 wetland areas confirmed in 2013)	27-48-22-222A	0.063
	27-48-23-234	0.078
	27-48-35-112	0.021
Horse Creek (29 total wetland areas confirmed in 2013)	26-48-02-322	0.014
	26-48-02-423A	0.61
	26-48-02-423B	0.314
	26-48-03-114[#]	ND
	26-48-03-134	0.009
	26-48-03-143[#]	ND
	26-48-03-213	2.173
	26-48-03-221	0.039
	26-48-03-321	0.023

Group	Wetland Site ID	Acres
	26-48-03-413A	0.068
	26-48-03-413B	0.066
	26-48-03-443	0.272
	26-48-03-444	0.519
	26-48-10-142	0.124
	26-48-10-232	0.033
	26-48-10-344 / 26-48-10-433	0.535
	26-48-10-441	0.019
	26-48-10-442	0.028
	26-48-10-444	0.016
	26-48-11-142	0.019
	26-48-11-144A/ 26-48-11-144B	0.385
	26-48-11-312	0.142
	26-48-11-422	0.215
	26-48-12-324	0.168
	26-48-12-341	0.047
	26-48-12-414	0.726
	26-48-12-432	0.027
	26-48-13-323/ 26-48-13-324/ 26-48-13-342/ 26-48-13-431/ 26-48-24-221	20.896

Group	Wetland Site ID	Acres
	26-48-13-432	0.426
Mill Canyon (2 wetlands confirmed present in 2013)	27-48-27-134	0.03
	27-48-27-134A	0.012
North Toiyabe Range West (confirmed no wetlands present in 2013)		NA
Willow Creek (13 wetlands confirmed present in 2013)	26-48-01-131	0.75
	26-48-01-141	0.016
	26-48-01-212#	ND
	26-48-01-212B	0.014
	26-48-01-223	0.015
	26-48-01-234	0.01
	26-48-02-224	0.005
	27-48-34-322A#	ND
	27-48-34-322B#	ND
	27-48-34-412#	ND
	27-48-34-421#	ND
	27-48-35-234#	ND
	27-48-35-311#	ND
Willow Springs	26-48-01-313B	0.292

Group	Wetland Site ID	Acres
(2 wetlands confirmed present in 2013)	26-48-01-323	0.152

[1] A wetland area may contain more than one seep/spring sampling/monitoring site. Table shows results from 2013 comprehensive HC/CUEP area wetland delineation effort.

[#] GIS polygons of wetland boundaries not available; site too small to delineate.

Table B-3. Groundwater Monitoring Wells and Piezometers

Well/Piezometer ID	Transducer Name	Coordinates		Formation*
		X	Y	
Carbonate Hydrogeologic Unit				
GRC-0050D	P1	540394	4441643	Dw
GRC-0050D	P2	540389	4441643	Dw
GRC-0050D	P3	540383	4441643	Dw
GRC-0058G	P1	539400	4442394	Dw
GRC-0058G	P2	539388	4442390	Dw
GRC-0141G	P1	539925	4443944	Dw
GRGT-006	P1	540081	4443769	Dw
GRGT-006	P2	540109	4443777	Dhc
GRGT-008	P1	539941	4442277	Dw
GRGT-008	P2	539966	4442291	Dw
GRMW-06	STEEL	539053	4442219	Dw
GRMW-10	STEEL	538792	4440145	Dhc
GRPZ-01	STEEL	537288	4446023	Srm
GRPZ-02	STEEL	537631	4444419	Srm
GRPZ-04	STEEL	538828	4444610	Dw
GRPZ-06	STEEL	538918	4443719	Dw
GRPZ-06	P2	538910	4443764	Dw
GRPZ-06	P3	538908	4443786	Dhc
GRPZ-08	STEEL	539984	4444260	Dw
GRPZ-11	STEEL	540451	4443228	Dw
GRPZ-12	PVC	539569	4442136	Dw

GRPZ-12	P1	539573	4442137	Dw
GRPZ-12	P2	539582	4442141	Dw
GRPZ-13	STEEL	540260	4442382	Dw
GRPZ-16	STEEL	540475	4441870	Dw
GRPZ-21	STEEL	541134	4440812	Dw
GRPZ-23	STEEL	541902	4440113	Dw
GRW-03	STEEL	540109	4442847	Dw
HCPZ-01	PVC	538301	4443749	
HCPZ-01	P1	538301	4443749	
HCPZ-03	PVC	540961	4441307	Dw
HCPZ-03	P1	540951	4441294	Dw
RHD12-142	P1	539648	4444192	Dw
RHD12-142	P2	539648	4444207	Dw
RHD12-142	P3	539647	4444244	Dw
RHMW-02	PVC	538890	4443009	Dw
RHMW-02	P2	538942	4443069	Dw
RHMW-04	PVC	540113	4442844	Dw
RHPZ-06	PVC	539800	4442920	Dw
RHPZ-06	P1	539811	4442917	Dw
RHPZ-07	PVC	539181	4443274	Dw
RHPZ-08	PVC	540316	4442840	Dw
RHPZ-09	PVC	540094	4443241	
RHPZ-10	PVC	539251	4443604	Srm
RHPZ-10	P3	539166	4443691	Dw
SS-01	STEEL	537556	4443594	

SS-02	STEEL	537758	4443334	
Basin Fill Hydrogeologic Unit				
RHPZ-08	P2	540297	4442838	Tc
GRMW-08	STEEL	539353	4441110	Tvc & Tg
GRMW-11	STEEL	541546	4440680	Tqa
GRPZ-12	P3	539597	4442144	Tg
GRPZ-13	P3	540257	4442380	Tg
GRPZ-16	P2	540461	4441875	Tg
GRPZ-21	P1	541133	4440776	Tvc
HCPZ-03	P3	540941	4441266	Tvc
HCPZ-03	P4	540945	4441254	Tvc
RHMW-04	P1	540110	4442844	Tqa
RHPZ-06	P2	539839	4442903	Tqa
Siliceous Hydrogeologic Unit				
GRGT-006	P3	540147	4443786	Ovi
GRPZ-36	P1	539474	4443868	Ovi
HCPZ-03	P2	540946	4441281	Ovi
RHPZ-08	P1	540309	4442842	Ovi

* Dw = Devonian Wenban Limestone; Dhc = Devonian Horse Canyon Member; Srm = Silurian Roberts Mountains Formation;; Tg = clay-altered volcanics; Tqa = Tertiary - Quaternary alluviums; Ovi =Ordovician Vinini Formation

$ SSHQGL['
* UHDWU6DJH
JURXVH+ DEITW
) LHOG
, QYHVWDWRQ
5 HSRUW(6&2
E

Greater Sage Grouse Habitat Suitability Ratings for HC/CUEP

Horse Canyon/Cortez Unified Exploration Project Plan of Operations (NVN-066621) and Reclamation Permit No. 0159

Prepared for:

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Prepared by:

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November 2014

Executive Summary

Based on quantitative vegetation data collected in the Horse Canyon/Cortez Unified Exploration Project (HC/CUEP) area between 2009 and 2014, and in consideration of guidance received from NDOW and BLM during a 5/27/14 field tour of the site, as well as literature available on the subject, a map of the HC/CUEP area showing categories of habitat suitability for Greater Sage Grouse (GSG) has been produced. In summary, Preliminary Priority Habitat (PPH) totals 3,263 acres (no acres of Essential / Irreplaceable Habitat and 3263 acres of Important Habitat), Preliminary General Habitat (PGH) totals 5,110 acres, Low Value / Transitional Range 5,313 acres, Unsuitable Habitat totals 8,338 acres and Non-habitat totals 282 acres.

Greater Sage Grouse Habitat Suitability Ratings for HC/CUEP

Five Nevada Department of Wildlife (NDOW) rating categories (NDOW 2013) are used to characterize the habitats within the HC/CUEP area in Eureka County, NV with regard to suitability for GSG. Extensive quantitative data collection and field familiarity in the HC/CUEP study area have provided the basis for these ratings. A field review with NDOW and BLM on 5/27/14 provided insights into criteria for habitat quality beyond those in the literature (e.g. Stiver et al. 2010) and especially how they were viewed in the particular context of the Horse Canyon area.

For purposes of general planning (but not project –specific evaluation), BLM (2012) redefined the five NDOW categories across Nevada. In this BLM three-category system, NDOW Categories 1 and 2 are combined to form Preliminary Priority Habitat (PPH) and Category 3 is recognized as Preliminary General Habitat (PGH). The results of application of both systems of categorization to the HC/CUEP area based on site-specific quantitative data collected by ESCO are graphically displayed in Appendix A.

Vegetation information referenced here was collected over the period of 2009 through May 2014 and was documented using quantitative methods described in Appendix B.

Data from this sampling (summarized for the HC/CUEP study area in Appendix C) include percent cover by species as well as accounting of species richness and density. Note that the data in Appendix C are summarized by vegetation mapping unit; the number of individual samples involved in the average cover values shown for a given mapping unit are shown at the bottom of the table. Locations at which the sampling that produced these data occurred are shown in Appendix D.

A portion of a state-wide map previously completed by Nevada Division of Wildlife showing ratings of habitat suitability within HC/CUEP using the 5-category system is attached as Appendix E. Another map (based on NDOW data) was produced by the U.S. Bureau of Land Management for most of Nevada including the present study area using the three-category system for rating GSG habitat suitability. A generalized map reflecting that information for HC/CUEP (Titled Figure 3.1) is present in Appendix F.

1. **NDOW Essential / Irreplaceable Habitat** (BLM PPH category)

There are no areas within HC/CUEP that are regarded as Essential / Irreplaceable habitat. Some areas have sagebrush cover (see Important Habitat below) that is close to the suitable range, and are located within exposed open areas, but the presence of suitable forbs is limited. There is very limited evidence of the use of these areas by GSG.

2. NDOW Important Habitat. (BLM PPH category)

These are lands in which structural and biological needs of GSG may be met, though there is limited evidence that they are occupied to any significant degree, possibly because large areas of lands less suitable surround them. Structural needs of GSG include open terrain, especially ridges as well as areas in general without tall woody plants (Photos 1, 2, 3, and 4). The HC/CUEP Important Habitat areas are high and exposed and (virtually) devoid of the tall woody plant species [Utah juniper (*Juniperus osteosperma*), singleleaf pinyon pine (*Pinus monophylla*), and curlleaf mountain mahogany (*Cercocarpus ledifolius*)] that would so strongly diminish habitat suitability were they present in substantial numbers.

The presence of sagebrush of course is both a biological and a structural requirement. The bulk of sagebrush present is mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with some Wyoming big sagebrush (*A. t*. ssp. *wyomingensis*). Much of the sagebrush community occurrence in HC/CUEP Important Habitat is on soils with clay-rich subsoils, sometimes smectitic (swelling clay) soils at higher elevation on convex sites (Appendix C, Column 1, Table 1). On wind-exposed ridges, in the Mountain Ridge sagebrush community, black sagebrush (*A. nova*) is typically predominant (Appendix C, Column 2, Table 1). Both mountain and Wyoming sagebrush may also be present but tend to be dwarfed by wind exposure. High winds during winter cause snow to accumulate in lee areas to form snow meadows (Photo 2; Appendix C, Column 3, Table 1). These areas are usually heavily covered by forbs (see below) and have sagebrush around the edge. Along the east-central boundary of HC/CUEP lies a small area of sagebrush occurring on basalt flows. These areas are rated as Important Habitat because sagebrush cover (19%) is high (Appendix C, Column 15, Table 1) and grass cover is moderate (6.0 %). Forb cover is however, low (average 1%). But taken together, the prevalence of sagebrush and even modest grass cover in conjunction with the high, open nature of these basalt sagebrush landscapes are regarded as favorable for GSG habitat. These areas are also known to connect to GSG-occupied areas to the north and west, according to information provided by NDOW during the 5/27/14 field tour.

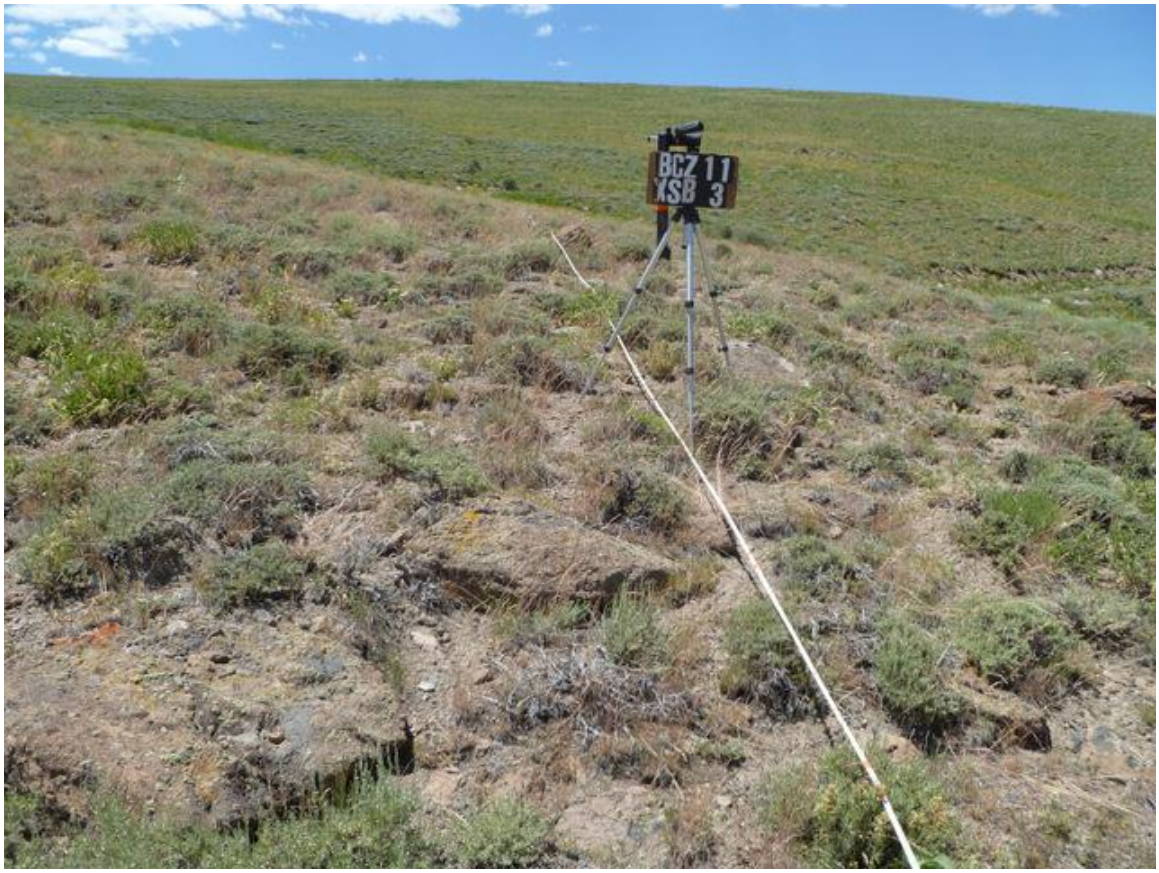

Photo 1.

Photo 2.

Photo 3.

Photo 4

Some areas of HC/CUEP that are rated as Important Habitat are on average somewhat low in sagebrush cover (between 3% and about 5% in the Swelling Clay and Snow Meadow Sagebrush (while the lower limit according to Stiver et al (2010) is 15%). Note however that sagebrush cover averages15% in the Mountain Ridge Sagebrush unit which is included in Important Habitat here. Certain of the HC/CUEP Important Habitat areas have a strong presence of forbs (averaging 30 to 50% cover in the Swelling Clay and Snow Meadow areas). Despite the fact that about 3/4 of that forb cover in these latter vegetation types is provided by mules ear (*Wyethia amplexicaulis*) and arrowleaf balsamroot (*Balsamorhiza sagittata*) both of which are of low to negligible value to GSG (Knick and Connelly 2011), the remaining ¼ of forb cover (over 10% absolute cover and well above the minimum cited by Stiver et al. (2010) of 5%) is comprised of species that are useful forage to GSG. Thus, in consideration of the high open topographic position and, taken altogether, at least somewhat favorable vegetation conditions, these are the areas within HC/CUEP that, at least on a relative scale, comprise Important Habitat. It

should be noted that these high and open areas were remarked upon by NDOW and BLM as characterizing very suitable habitat during the 5/27/14 field tour.

The sub-irrigated bottomland along Horse Creek (Appendix C, Column 4, Table 1) is also included as Important Habitat (Photo 5). Although it is devoid of sagebrush, tussocks of basin wildrye (*Leymus cinereus*) offer similar structure and the abundance of herbaceous ground layer growth on a fairly open expanse is thought to provide potential brood rearing forage resources.

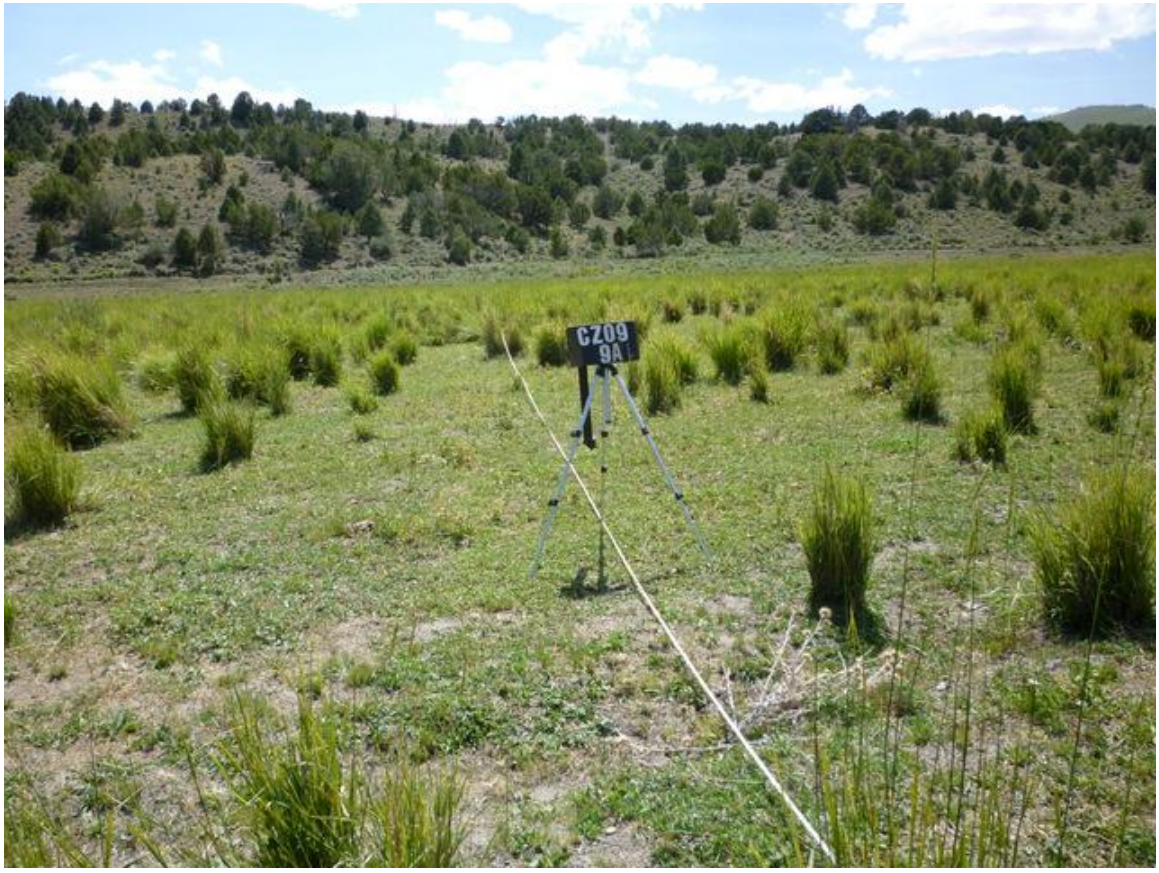

Photo 5

3. **NDOW Habitat of Moderate Importance** (BLM PGH category)

These are lands within HC/CUEP which are partly (like the Important Habitat-) located on clay-rich soils but by contrast are in generally concave (Horse Canyon valley) positions. In addition they were burned in the 1999 fire and so sagebrush cover is much lower (<2% cover). Perhaps also related to the fire is greater abundance of the non-palatable forb species especially mules ears and arrowleaf balsamroot (Photo 6).

Although trees and tall shrubs were killed by the fire, their hulks (standing dead boles) remain in varying amounts (Photo 7). These areas are at high enough elevation with slightly greater precipitation so that perennial herbaceous cover (especially mules ear and balsamroot) developing after the fire has prevailed over cheatgrass, the latter averaging only about 1% cover. Perennial grass cover averages about 7% (Appendix C, Column 5, Table 1).

Photo 6

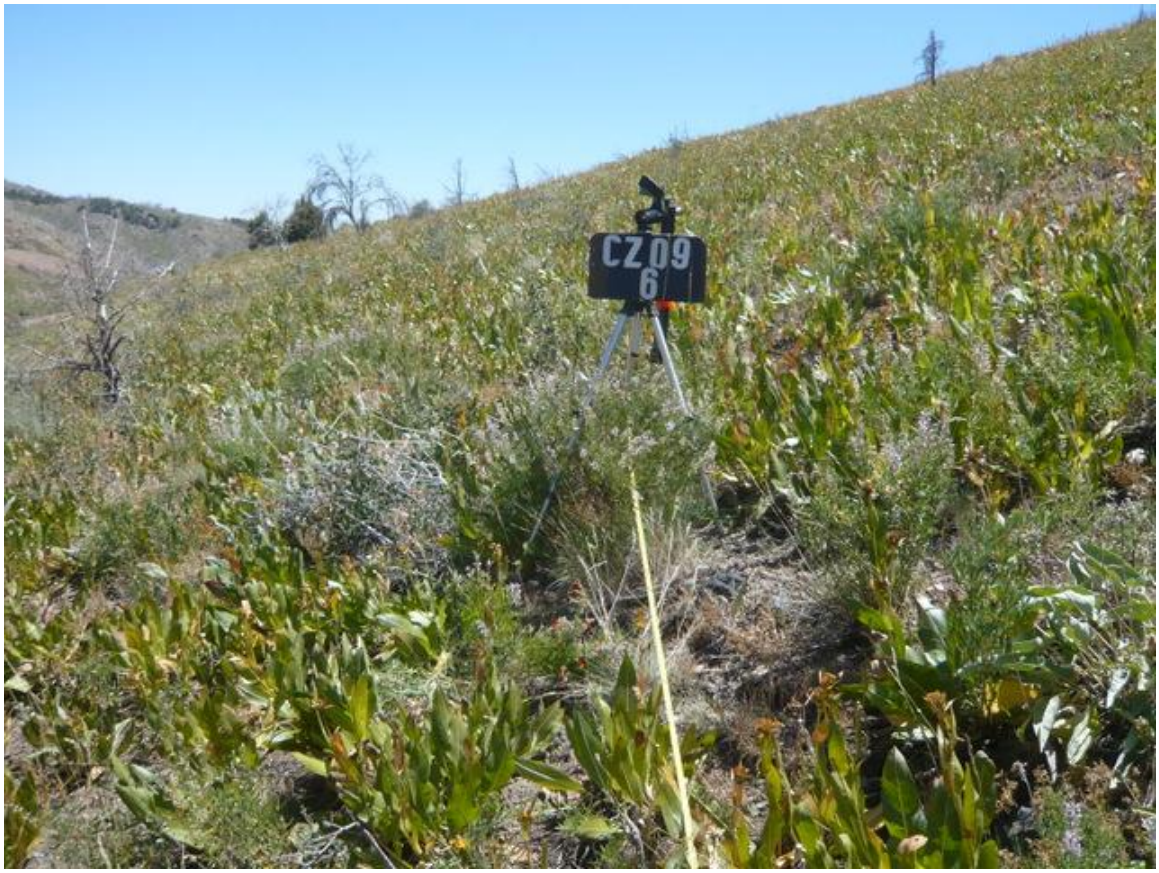

Photo 7

In addition to the swelling clay areas described above, the Habitat of Moderate Importance category within HC/CUEP includes sagebrush occurring on low-slope alluvium in the southeast corner of the study area and some sagebrush on low elevation dissected terrain on the north end. In the former areas (Photo 8; Appendix C, Column 6, Table 1) sagebrush cover is in the range of 10 to 15% (average 12%) and perennial grass cover averages 5%, while forb cover averages 1.3%. Prevalence of cheatgrass is limited (1.3%).

Sagebrush of dissected terrain at the north end (Photo 9) is well-covered by sagebrush, (mostly Wyoming big sagebrush but with occasional basin big sagebrush). Total sagebrush cover averaged 26% (Appendix C, Column 7, Table 1). Cover by cheatgrass is high (29%). Perennial grass cover is very limited, averaging 3%, while perennial forb cover is moderate (average 6%), largely tailcup lupine (*Lupinus caudatus*). It should be noted that in this dissected terrain, much of the area is located in concave settings

(valleys), comparatively poorly suited to GSG use. Those parts near the ridge tops may offer better suitability to GSG

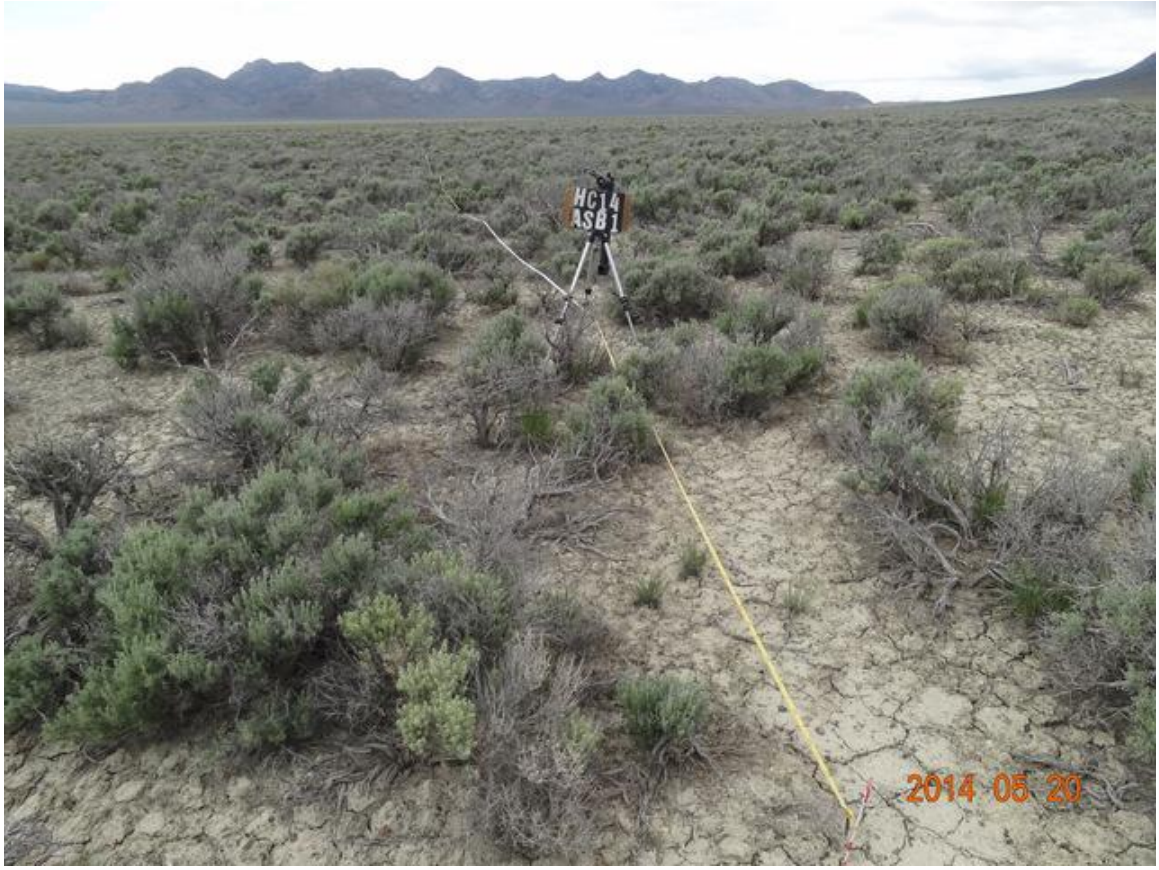

Photo 9

4. NDOW Low Value / Transitional Range

These lands within HC/CUEP are mostly at lower elevations and to a large degree include lands that were burned in 1999. Before the fire, some of the area was occupied by sagebrush stands and some areas had stands of pygmy conifers, either Utah juniper (*Juniperus osteosperma*) or that species plus singleleaf pinyon pine (*Pinus monophylla*). Standing dead boles of these trees continue to be present in areas that were formerly wooded (Photo 10). In the burned juniper woodlands (Appendix C, Column 8, Table 1) shrub cover is very low (0.5% average); sagebrush cover is essentially non-existent. Perennial grass and perennial forb cover each are less than 5%. Cheatgrass cover averages over 41%.

In burned pinyon-juniper woodland, total cover by shrubs average somewhat greater at 6.4% (Appendix C, Column 9, Table 1), but of this total only 0.4% is sagebrush cover and the remainder is rubber rabbitbrush (*Chrysothamnus nauseosus*). Cover by perennial grass averaged 5.2% and native perennial forbs cover was 19.4%. Cover by cheatgrass averaged 8.8%.

In areas where sagebrush occurred prior to the fires, remaining or regenerating sagebrush cover (<0.2%) is very sparse (Appendix C, Columns 10 and 11, Table 1). In their current (post-fire) condition these lands are heavily covered by cheatgrass (*Bromus tectorum)*; 29.7% on south, west and east-facing slopes (Appendix C, Column 10, Table 1) and 12.0% on north aspects (Appendix C, Column 11, Table 1). Cheatgrass comprises over half of total vegetation cover on south, west and east-facing slopes (Photo 11) in these areas, and is about 1/5 of total vegetation cover on north-facing slopes (Photo 12) where competition from recovering cool season perennial grass cover is much greater.

Photo 10

Photo 11

Photo 12

5. NDOW Unsuitable Habitat.

Lands designated as Unsuitable Habitat within HC/CUEP are heavily wooded lands; some are dominated by Utah juniper (Appendix C, Column 13, Table 1; Photo 13), some are combinations of juniper and singleleaf pinyon (Appendix C, Column 13, Table 1; Photo 14) and some combine curlleaf mountain mahogany with juniper and singleleaf pinyon (Appendix C, Column 14, Table 1; Photo 15). Within the HC/CUEP study area, stands of trees and tall shrubs are largely found on sites that are likely to be “natural” sites for woodland occurrence as opposed to those in which expansion of the large woody plants has occurred in historic time onto deeper soils that were likely historically grass or sagebrush - covered. Heavily wooded sites in HC/CUEP are steep and rocky with shallow and poorly developed soils (mostly Entisols and some Aridosols) that are likely to have supported trees and tall shrubs for long periods. The understory in these sites is sparse with both limited sagebrush presence (< 5% cover in juniper woodland

(Column 12, Table 1) and < 2% in pinyon –juniper woodland (Appendix C, Column 13, Table 1)) and very limited cover by herbaceous species (less than 2.5% cover by forbs or by perennial grasses). Tree cover averages slightly greater than 10% in juniper woodland, about 25% in pinyon –juniper woodland and about 20% for mountain mahogany (including this very tall shrub/tree). Taken altogether, the prevalence of tall woody cover and the sparse herbaceous cover render these sites unsuitable as GSG habitat.

Photo 13

Photo 14

Photo 15

Non-Habitat

Areas mapped as “Non-habitat” are areas disturbed by previous mineral extraction. These are mostly open pits of exposed raw rock faces, devoid of soil and vegetation cover.

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HC/CUEP PoO

Sage Grouse Habitat Categories (ESCO)

Preliminary Priority Habitat (PPH) (1 & 2)
- 1 - Essential / Irreplaceable Habitat (0 ac)
- 2 - Important Habitat (3,263 ac)

Preliminary General Habitat (PGH) (3)
- 3 - Habitat of Moderate Importance (5,110 ac)

4 - Low Value Habitat / Transitional Range (5,313 ac)

5 - Unsuitable Habitat (8,338 ac)

N/A – Non-Habitat (283 ac)

1 in = 1 mile

0 0.5 1 Mile

Imagery Sources:
2013 Barrick Aerial Imagery
2013 NAIP Imagery (1 meter resolution)

Barrick Gold Exploration Inc.
293 Spruce Road
Elko, Nevada 89801

Barrick HC/CUEP PoO Project

Proposed Sage Grouse Habitat Categories (ESCO) HC/CUEP PoO

ESCO Associates Inc.

APPENDIX **A**

11/11/2014 CD

Appendix B. Methods Used in HC/CUEP Vegetation Studies

Methods

The HC/CUEP area was examined during the growing seasons of 2009, 2011, 2012, 2013 and May 2014. A combination of field exploration and aerial image interpretation allowed progressive development of vegetation maps of the study area. Throughout the field work, areas newly visited were documented with quantitative samples as detailed below.

At each such sample site, cover data were collected using a point-intercept method in which data were tabulated as interceptions of a projected point with either plant species, bare ground, litter, standing dead, or rock. The cover sampling points were optically projected using a Cover-Point Optical Point Projection Device. Sampling occurred along randomly located and randomly oriented 50m transects. At each meter from one to fifty along the transect, a point was vertically projected from a location 50 cm to the left of the transect and a point was vertically projected from a location 50 cm to the right of the transect (avoiding trampled vegetation along the tape itself). Thus, data from a total of 2 x 50, or 100 points were recorded. Plant interceptions were tallied by species upon interception of the projected point with any attached plant part produced during the current growing season. Litter was considered to be any organic material that had fallen, or had begun to fall to the soil surface. Standing dead was any dead plant material that was produced in previous years but which was still standing and had not lodged or broken off to become litter. Rock was considered to be any inorganic fragment with a diameter greater than or equal to 1 cm. Bare soil was considered to be inorganic fragments with a diameter less than 1 cm or organic debris too small to be of readily identifiable origin.

In addition to "first hit" data (the first interception of any of the above materials as a point projected from above), "additional hit" data (any additional live species intercepted between the first hit and the ground) were collected. First hit interceptions were used to calculate absolute top layer (first hit) foliar cover by dividing the number of interceptions for a particular species or material by the total number of points taken (100). First hit

relative vegetation cover was calculated by dividing first hit absolute cover for each species by the total first hit vegetation cover. All-layer absolute cover was calculated by dividing all hits for particular species by the total number of points taken (100). In addition, all-layer relative cover was calculated using all hits for particular species divided by the total vegetation hits accumulated during sampling of the transect.

A full accounting of all plant species encountered along each transect sampled for cover was compiled. Species presence was noted within the area to one meter on either side of the transect (50 m x 2 m = 100 m^2). These presence data along with point-intercept data were used to produce values for species density expressed on a per-100 sq.m. basis.

Plants encountered that are reported here follow nomenclature of the Flora of North America (NAFEC 1993 to 2010) for plant species in families covered as of 2012, and follow the Intermountain Flora (NYBG 1972 to 2005) for others. Geologic information was gathered with reference to USGS (1964 and 1965) and Nevada Bureau of Mines (1967, 1971, and 1976). Soils information from the Natural Resource Conservation Service (NRCS) were reviewed for use in the discussions attached here (NRCS website 2011).

Table 1. Vegetation of All Areas by Percent Absolute Cover, HC/CUEP, Eureka and Lander Counties, NV - Barrick Gold Exploration, Inc.

COLUMN #	1	2	3	4	5	6	7	8
	High Elevation Swelling Clay	**Mountain Ridge Sagebrush**	**Snow Meadow**	**Valley Bottom Meadow**	**Valley Swelling Clay**	**Alluvial Sagebrush**	**Sagebrush of Dissected Slopes**	**Burned Juniper Woodland**
PLANT SPECIES	---------- AVERAGE ABSOLUTE COVER (%) ----------							
NATIVE ANNUAL & BIENNIAL FORBS								
Aliciella sp								
Amsinckia tessellata								
Boechera holboellii								
Ceratocephala testiculata								
Chaenactis stevioides								
Chenopodium fremontii								
Cirsium scariosum								
Collinsia parviflora		P	P			P		
Collomia grandiflora			0.25					
Collomia linearis								
Collomia tinctoria			1.00					
Cordylanthus ramosus	1.00	P	P					
Cryptantha barbigera								
Cryptantha torreyana			0.25					P
Descurainia pinnata						P		
Descurainia richardsonii		P		P				
Epilobium brachycarpum			P	P	P		P	
Eriogonum cernuum								
Galium aparine								
Gayophytum diffusum								P
Gayophytum ramosissimum								
Ipomopsis aggregata			P		P			
Ipomopsis congesta								
Ipomopsis pumila								
Lappula occidentalis var. cupulata					0.2			
Lepidium densiflorum								
Leptosiphon septentrionalis								
Lupinus pusillus		P	P					P
Lupinus uncialis						P		
Madia glomerata								
Mentzelia dispersa								
Microsteris gracilis						P	1.00	
Montia perfoliata								
Polygonum douglasii			P					
Polygonum ramosissimum				P				
Ranunculus testiculatus					P			
Silene sp.			P					
Streptanthella longirostris								
TOTAL NATIVE ANN. & BIEN. FORBS	1.0	0.0	1.5	0.0	0	0.0	1.00	0.0

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Table 1. Vegetation of All Areas by Percent Absolute Cover, HC/CUEP, Eureka and Lander Counties, NV - Barrick Gold Exploration, Inc.

COLUMN #	1	2	3	4	5	6	7	8
	High Elevation Swelling Clay	**Mountain Ridge Sagebrush**	**Snow Meadow**	**Valley Bottom Meadow**	**Valley Swelling Clay**	**Alluvial Sagebrush**	**Sagebrush of Dissected Slopes**	**Burned Juniper Woodland**
INTRODUCED ANNUAL & BIENNIAL FORBS								
Alyssum alyssoides						P		
Alyssum desertorum				P				2.00
Alyssum simplex						P		
Carduus nutans				5.67				
Ceratocephala testiculata						1.33		
Chorispora tenella				2.33				
Erodium cicutarium								0.50
Lactuca serriola		P			P			P
Polygonum aviculare				0.67				
Salsola tragus								
Sisymbrium altissimum			P					
Thlaspi arvense				P				
Tragopogon dubius								P
TOTAL INTRO. ANN. & BIEN. FORBS		0.0	0.0	8.7	0.2	1.3		2.5
NATIVE ANNUAL GRASSES								
Deschampsia danthonioides			1.75					
TOTAL NATIVE ANN. GRASSES			1.8					
INTRODUCED ANNUAL GRASSES								
Bromus japonicus								
Bromus tectorum		P	0.25	1.00	1.20	1.33	29.00	41.50
TOTAL INTRO. ANN. GRASSES		0.0	0.3	1.0	1.2	1.3	29.00	41.5
NATIVE PERENNIAL FORBS								
Achillea millefolium				0.33				
Agastache urticifolia			0.25					
Agoseris glauca			P					
Allium anceps						P		
Allium atrorubens								
Allium nevadense								
Antennaria sp.								
Artemisia ludoviciana				P				
Asclepias spp.								
Aster falcatus				P				
Astragalus calycosus								P
Astragalus curvicarpus					P			0.50
Astragalus eremiticus					P			

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NATIVE PERENNIAL FORBS								
Astragalus flexuosus								
Astragalus iodanthus		P						0.50
Astragalus kentrophyta								
Astragalus lentiginosus			1.25		P			
Astragalus newberryi								
Astragalus purshii		0.40			P			
Astragalus sp.		P				P		
Astragalus tenellus			P					
Astragalus whitneyi var whitneyi					P			
Balsamorhiza hookeri								
Balsamorhiza sagittata	13.00	P	11.75		9.80			1.00
Calochortus nuttallii		P			P			
Castilleja angustifolia			P					
Castilleja angustifolia var. flavescens		P						
Castilleja linariifolia			P					
Castilleja pallescens var. inverta		0.20						
Caulanthus crassicaulis		P			P			
Cirsium subniveum								
Crepis acuminata	P	0.40	1.75					
Crepis intermedia								
Crepis occidentalis		0.20			P	P	1.00	P
Cymopterus longipes		P						
Delphinium nuttallianum					P			
Eremogone capillaris		1.80	P					
Eremogone kingii								
Erigeron bloomeri		P				0.67		
Erigeron jonesii					0.40			
Eriogonum lonchophyllum			P		0.20			
Eriogonum ovalifilium						P		
Eriogonum ovalifolium var. depressum		0.60						P
Eriogonum ovalifolium var. nivale		P	P					
Erigeron pumilus var. intermedius								
Eriogonum ovalifolium var. nivale								
Eriogonum umbellatum	1.00		0.25		P			
Eriogonum umbellatum ssp majus					P			
Eriophyllum lanatum								
Fritillaria atropurpurea								
Galium multiflorum			P					
Hackelia patens								

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NATIVE PERENNIAL FORBS								
Helianthella uniflora	1.00		1.00		1.40			
Hymenoxys cooperi var. canescens		P						
Iliamna rivularis				P				
Ionactis alpina								
Iva axillaris				3.33	P			
Leptodactylon pungens	P	0.80				P		
Lewisia rediviva		P						
Linum lewisii					P			
Lithospermum multiflorum								
Lithospermum ruderale	P		P		0.20			
Lomatium dissectum	P	P	1.25		3.00			
Lomatium foeniculaceum						P		
Lupinus arbustus		P	1.00					
Lupinus argenteus	2.00		5.25		1.60			2.00
Lupinus caudatus							5.50	
Lygodesmia juncea							0.00	
Machaeranthera canescens			P					
Machaeranthera grindelioides								
Mertensia lanceolata		0.60			0.20			
Microseris nutans						P		
Nothocalais cuspidata					P			
Oreocarya flavoculata		P	P					
Oreocarya sp.								
Oreostemma alpigenum var. haydenii	P	0.80	1.25					
Paeonia brownii			P					
Penstemon deustus						P		
Penstemon humilis	P							P
Penstemon sp.								
Penstemon speciosus			0.25		0.20			
Perideridia bolanderi								
Phacelia hastata								
Phlox hoodii		1.00						
Phlox longifolia			0.25		1.00	0.33	0.00	
Phlox multiflora		P				P		0.50
Phlox pulvinata		P						
Pleiacanthus spinosus		P						
Ranunculus sp.				P				
Scutellaria angustifolia								
Senecio integerrimus	P	P	P		0.20	0.33		

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NATIVE PERENNIAL FORBS								
Senecio multilobtus					P			
Sphaeralcea ambigua								P
Sphaeralcea coccinea						P		
Sphaeralcea grossulariifolia					P			
Stenotus armerioides		0.20						
Symphyotrichum sp.					0.20			
Viola vallicola			0.25					
Wyethia amplexicaulis			26.50		15.20			
Zigadenus venenosus								
TOTAL NATIVE PERENNIAL FORBS	17.0	7.0	52.3	3.7	33.6	1.3	6.00	4.5
INTRODUCED PERENNIAL FORBS								
Cardaria draba				8.33				
Taraxacum officinale								
TOTAL INTRO. PERENNIAL FORBS				8.3				
NATIVE PERENNIAL GRASSES (cool)								
Achnatherum hymenoides	P	P	P			P		0.50
Achnatherum lettermanii					0.80	0.67		
Achnatherum nelsonii			0.50		P			
Achnatherum thurberianum		0.20	1.00					0.50
Achnatherum webberi								
Agropyron scribneri								
Bromelica bulbosa			P		P			
Bromelica specatilis					0.20			
Bromus marginatus			P					
Ceratochloa marginata					P			
Elymus elymoides	P	1.00	0.75		1.20	0.67		0.50
Elymus lanceolatus var. albicans					P			
Elymus lanceolatus var griffithsii								
Elymus lanceolatus var lanceolatus		P		0.67				
Elymus lanceolatus ssp. riparius								0.50
Elymus longifolius					0.60			
Elymus smithii								
Elymus trachycaulus			P					
Festuca idahoensis		P	0.25					
Festuca saximontana	16.00	0.40						
Festuca sororia					3.00		3.00	
Hesperostipa comata		P						

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NATIVE PERENNIAL GRASSES (cool)								
Leymus cinereus				7.67	P			
Leymus triticoides	1.00		1.00					
Oryzopsis hymenoides				1.00				
Poa agassizensis				1.33				
Poa fendleriana								
Poa secunda var. juncifolia			P			P		
Poa secunda ssp secunda		7.00	1.25		1.20	3.33		0.50
Pseudoroegneria spicata		0.20	P		0.40			1.50
Pseudoroegneria spicatus ssp spicatus								
TOTAL NATIVE PERENNIAL GRASSES (c)	17.0	8.8	4.8	10.7	7.4	4.7	3.00	4.0
INTRODUCED PERENNIAL GRASSES (cool)								
Agropyron cristatum								
Bromus inermis				7.67				
Elymus junceus				8.33				
Poa pratensis			0.25					
Thinopyrum intermedium					P			
TOTAL INTRO. PERENNIAL GRASSES (c)			0.3	16.0	0.0			
NATIVE SUBSHRUBS								
Eriogonum brevicaule			P					
Eriogonum microthecum		P					0.00	
Gutierrezia sarothrae						0.33		
Leptodactylon caespitosum								4.00
Penstemon deustus var pedicellatus								
TOTAL NATIVE SUBSHRUBS		0.0	0.0			0.3	0.0	4.0
NATIVE SHRUBS								
Amelanchier alnifolia					P			
Amelanchier utahensis	1.00		P		0.40			
Artemisia nova	2.00	15.40	0.25					
Artemisia tridentata ssp. undetermined	12.00	P	2.75		2.60		26.00	
Artemisia tridentata ssp. wyomingensis						11.00		
Artemisia tridentata ssp. vaseyana						1.00		
Atriplex canescens						P		
Cercocarpus ledifolius								
Chrysothamnus depressus		0.60	P					
Chrysothamnus greenei								
Chrysothamnus nauseosus					P			

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NATIVE SHRUBS								
Chrysothamnus viscidiflorus	1.00	P	0.50		0.80	0.33	0.00	0.50
Ephedra viridis								
Kochia prostrata								
Lycium sp.		0.20			0.20			
Prunus andersonii							0.00	
Ribes inerme								
Ribes velutinum		0.20	P					
Symphoricarpos longiflorus	P		2.00					
Tetradymia canescens					P			
TOTAL NATIVE SHRUBS	16.0	16.4	5.5		4.0	12.3	26.00	0.5
NATIVE TREES								
Juniperus osteosperma								
Pinus monophylla					0.80			
TOTAL NATIVE TREES					0.8			
SUCCULENTS								
Opuntia phaeacantha								
TOTAL SUCCULENTS								
PARASITE								
Orobanche fasciculata					P			
TOTAL PARASITE					0.0			

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MUSHROOMS								
Fungus								
TOTAL MUSHROOMS								
Standing dead	5.00	2.60	0.75	0.67	0.80	6.67	1.00	1.00
Litter	11.00	13.00	14.00	33.00	18.00	15.00	26.50	20.50
Bare ground	31.00	36.60	14.75	17.00	23.80	48.67	2.50	19.00
Rock	2.00	15.60	4.25	1.00	10.20	8.33	5.00	2.50
TOTALS	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL VEGETATION COVER	51	32	66	48	47	21	65.00	57
GROUND COVER (Litter+Rock+Veg+St.Dead)	69.0	63.4	85.3	83.0	76.2	51.3	97.5	81.0
SPECIES DENSITY (# of species/100 sq.m.)	21.0	17.8	24.8	10.3	22.4	14.7	9.0	21.0
Standard Deviation	0.0	3.9	8.4	0.6	5.0	6.0		1.4
Number of Samples	1	5	4	3	5	3	2	2

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COLUMN #	9	10	11	12	13	14	15
	Burned Pinyon-Juniper Woodland	Burned Sagebrush of Dissected Slopes (E, W, S Aspects)	Burned Sagebrush of Dissected Slopes (N Aspects)	Juniper Woodland	Pinyon-Juniper Woodland	Mountain Mahogany Woodland	Basalt Sagebrush
PLANT SPECIES	---------- AVERAGE ABSOLUTE COVER (%) ----------						
NATIVE ANNUAL & BIENNIAL FORBS							
Aliciella sp		P					
Amsinckia tessellata			P				
Boechera holboellii			P	P		P	
Ceratocephala testiculata							
Chaenactis stevioides					P	P	
Chenopodium fremontii						P	
Cirsium scariosum	P						
Collinsia parviflora		P	0.17			0.50	
Collomia grandiflora	P		P			0.67	
Collomia linearis			P				P
Collomia tinctoria					P	0.17	
Cordylanthus ramosus						P	
Cryptantha barbigera				P	P		
Cryptantha torreyana			0.17			0.17	
Descurainia pinnata	P			P	P	P	
Descurainia richardsonii							
Epilobium brachycarpum	0.60	0.14	P	P	P	P	
Eriogonum cernuum						P	
Galium aparine					P	0.17	
Gayophytum diffusum							
Gayophytum ramosissimum		0.43	P	P			
Ipomopsis aggregata							
Ipomopsis congesta	0.40				P	P	
Ipomopsis pumila				P	P	P	
Lappula occidentalis var. cupulata	0.20		P				
Lepidium densiflorum			0.17				
Leptosiphon septentrionalis				P	P		
Lupinus pusillus	P			P	0.13		
Lupinus uncialis		P		P			P
Madia glomerata		P					
Mentzelia dispersa			P				
Microsteris gracilis		P	0.17		P		
Montia perfoliata						P	
Polygonum douglasii						P	
Polygonum ramosissimum							
Ranunculus testiculatus							
Silene sp.							
Streptanthella longirostris					P		
TOTAL NATIVE ANN. & BIEN. FORBS	1.2	0.6	0.7	0.0	0.1	1.7	0.0

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INTRODUCED ANNUAL & BIENNIAL FORBS							
Alyssum alyssoides	0.40		P		P		
Alyssum desertorum		3.00		0.50	0.25		P
Alyssum simplex							
Carduus nutans							
Ceratocephala testiculata							
Chorispora tenella							
Erodium cicutarium		0.57					
Lactuca serriola	0.40		P		P		
Polygonum aviculare							
Salsola tragus	P						
Sisymbrium altissimum	P	P					
Thlaspi arvense							
Tragopogon dubius	0.20	P	P		P		
TOTAL INTRO. ANN. & BIEN. FORBS	1.0	3.6	0.0	0.5	0.3		0.0
NATIVE ANNUAL GRASSES							
Deschampsia danthonioides							
TOTAL NATIVE ANN. GRASSES							
INTRODUCED ANNUAL GRASSES							
Bromus japonicus	0.20						
Bromus tectorum	8.60	29.71	12.00	0.25	0.13	0.33	P
TOTAL INTRO. ANN. GRASSES	8.8	29.7	12.0	0.3	0.1	0.3	0.0
NATIVE PERENNIAL FORBS							
Achillea millefolium							
Agastache urticifolia							
Agoseris glauca			P				P
Allium anceps							
Allium atrorubens					P		
Allium nevadense		P				P	
Antennaria sp.							P
Artemisia ludoviciana							
Asclepias spp.	P						
Aster falcatus							
Astragalus calycosus							
Astragalus curvicarpus	0.20	P	P				
Astragalus eremiticus	P	P		P	P		

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NATIVE PERENNIAL FORBS							
Astragalus flexuosus				0.25	0.13		P
Astragalus iodanthus		0.43	P	P	P	P	
Astragalus kentrophyta	1.00						
Astragalus lentiginosus	P						
Astragalus newberryi				P	P		
Astragalus purshii	P	P	P	P	P		
Astragalus sp.					P		
Astragalus tenellus							
Astragalus whitneyi var whitneyi							
Balsamorhiza hookeri		P					P
Balsamorhiza sagittata	4.40	P	1.83		0.25	14.00	
Calochortus nuttallii			P	P	P	P	
Castilleja angustifolia							P
Castilleja angustifolia var. flavescens							
Castilleja linariifolia						P	
Castilleja pallescens var. inverta							
Caulanthus crassicaulis						P	
Cirsium subniveum				P			
Crepis acuminata			0.17			0.17	
Crepis intermedia		0.29					1.00
Crepis occidentalis	0.40	0.29	0.33	P	P	0.17	P
Cymopterus longipes		P	P	P		0.17	
Delphinium nuttallianum					P	P	
Eremogone capillaris			0.33				
Eremogone kingii					P		
Erigeron bloomeri		P					
Erigeron jonesii					P		
Eriogonum lonchophyllum	0.20						
Eriogonum ovalifilium					P		
Eriogonum ovalifolium var. depressum				P			
Eriogonum ovalifolium var. nivale		P		0.75	P		
Erigeron pumilus var. intermedius			P				
Eriogonum ovalifolium var. nivale			0.17				
Eriogonum umbellatum				P		0.33	
Eriogonum umbellatum ssp majus					P		
Eriophyllum lanatum						0.17	
Fritillaria atropurpurea			P			P	
Galium multiflorum					P	P	
Hackelia patens						P	

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NATIVE PERENNIAL FORBS							
Helianthella uniflora					P	1.33	
Hymenoxys cooperi var. canescens					P		
Iliamna rivularis							
Ionactis alpina				0.25			
Iva axillaris	5.00	P					
Leptodactylon pungens				P	P	0.17	
Lewisia rediviva							
Linum lewisii							
Lithospermum multiflorum	P						
Lithospermum ruderale	P	0.43	0.17		P	0.17	
Lomatium dissectum	P	0.14	P	0.50	P	1.17	P
Lomatium foeniculaceum	P						
Lupinus arbustus	0.20					0.33	
Lupinus argenteus	5.80	1.86	8.83		P		
Lupinus caudatus					P		
Lygodesmia juncea	0.20						
Machaeranthera canescens					P	P	
Machaeranthera grindelioides						P	
Mertensia lanceolata					P		
Microseris nutans	P	0.14	0.33				P
Nothocalais cuspidata							
Oreocarya flavoculata	P			P	P	0.50	
Oreocarya sp.		P					
Oreostemma alpigenum var. haydenii			0.50	P			
Paeonia brownii							
Penstemon deustus							
Penstemon humilis							P
Penstemon sp.					P		
Penstemon speciosus	P			P	P	P	
Perideridia bolanderi			P			P	
Phacelia hastata						P	
Phlox hoodii	0.40				P		
Phlox longifolia	1.60	P	0.17			P	P
Phlox multiflora		1.14	2.50	P	P	0.17	P
Phlox pulvinata		0.43				P	
Pleiacanthus spinosus		P	0.50				
Ranunculus sp.							
Scutellaria angustifolia		P					
Senecio integerrimus	P				P	0.33	

*P= Present within 1m of either side of the cover transect, but not quantitatively encountered.

Table 1. Vegetation of All Areas by Percent Absolute Cover, HC/CUEP, Eureka and Lander Counties, NV - Barrick Gold Exploration, Inc.

COLUMN #	9	10	11	12	13	14	15
	Burned Pinyon-Juniper Woodland	Burned Sagebrush of Dissected Slopes (E, W, S Aspects)	Burned Sagebrush of Dissected Slopes (N Aspects)	Juniper Woodland	Pinyon-Juniper Woodland	Mountain Mahogany Woodland	Basalt Sagebrush
NATIVE PERENNIAL FORBS							
Senecio multilobtus	P				P	P	
Sphaeralcea ambigua	P	P	P	P			
Sphaeralcea coccinea							
Sphaeralcea grossulariifolia	P						
Stenotus armerioides				P	P		
Symphyotrichum sp.							
Viola vallicola	P					P	
Wyethia amplexicaulis	P				0.13	0.17	
Zigadenus venenosus		P					
TOTAL NATIVE PERENNIAL FORBS	19.4	5.1	15.8	1.8	0.5	19.3	1.0
INTRODUCED PERENNIAL FORBS							
Cardaria draba							
Taraxacum officinale		P					
TOTAL INTRO. PERENNIAL FORBS		0.0					
NATIVE PERENNIAL GRASSES (cool)							
Achnatherum hymenoides	1.20	P		0.25	P	0.17	
Achnatherum lettermanii	0.20						
Achnatherum nelsonii						P	
Achnatherum thurberianum		0.86	2.17	0.25			3.00
Achnatherum webberi		0.14					
Agropyron scribneri		0.29	P				
Bromelica bulbosa							
Bromelica specatilis							
Bromus marginatus						P	
Ceratochloa marginata							
Elymus elymoides	0.20	1.57	1.83	P	0.38	0.17	3.00
Elymus lanceolatus var. albicans	0.40	P	P				
Elymus lanceolatus var griffithsii	0.20						
Elymus lanceolatus var lanceolatus	0.60				P		
Elymus lanceolatus ssp. riparius							
Elymus longifolius	0.20						
Elymus smithii	P						
Elymus trachycaulus							
Festuca idahoensis							
Festuca saximontana			3.33				
Festuca sororia	0.20				0.13		
Hesperostipa comata							

*P= Present within 1m of either side of the cover transect, but not quantitatively encountered.

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	Burned Pinyon-Juniper Woodland	Burned Sagebrush of Dissected Slopes (E, W, S Aspects)	Burned Sagebrush of Dissected Slopes (N Aspects)	Juniper Woodland	Pinyon-Juniper Woodland	Mountain Mahogany Woodland	Basalt Sagebrush
NATIVE PERENNIAL GRASSES (cool)							
Leymus cinereus	0.60						
Leymus triticoides	0.20	0.86	2.17	P	0.13	1.00	
Oryzopsis hymenoides							
Poa agassizensis							P
Poa fendleriana					P		
Poa secunda var. juncifolia					0.25	0.17	
Poa secunda ssp secunda	0.60	1.86	9.00	0.75	1.25	P	P
Pseudoroegneria spicata	0.20	2.43	0.50		P	0.33	
Pseudoroegneria spicatus ssp spicatus	0.40						
TOTAL NATIVE PERENNIAL GRASSES (c)	5.2	8.0	19.0	1.3	2.1	1.8	6.0
INTRODUCED PERENNIAL GRASSES (cool)							
Agropyron cristatum	0.20						
Bromus inermis							
Elymus junceus							
Poa pratensis							
Thinopyrum intermedium							
TOTAL INTRO. PERENNIAL GRASSES (c)	0.2						
NATIVE SUBSHRUBS							
Eriogonum brevicaule			P				
Eriogonum microthecum				P	P	P	
Gutierrezia sarothrae							
Leptodactylon caespitosum		0.29	0.33	0.75	P		
Penstemon deustus var pedicellatus						P	
TOTAL NATIVE SUBSHRUBS		0.3	0.3	0.8	0.0	0.0	
NATIVE SHRUBS							
Amelanchier alnifolia							
Amelanchier utahensis					P	0.50	
Artemisia nova				1.25	P		
Artemisia tridentata ssp. undetermined		0.14	0.17	2.50	1.50	1.83	19.00
Artemisia tridentata ssp. wyomingensis					P		
Artemisia tridentata ssp. vaseyana							
Atriplex canescens							
Cercocarpus ledifolius					0.25	16.00	
Chrysothamnus depressus				P	P		
Chrysothamnus greenei				P			
Chrysothamnus nauseosus		0.57					

*P= Present within 1m of either side of the cover transect, but not quantitatively encountered.

Table 1. Vegetation of All Areas by Percent Absolute Cover, HC/CUEP, Eureka and Lander Counties, NV - Barrick Gold Exploration, Inc.

COLUMN #	9	10	11	12	13	14	15
	Burned Pinyon-Juniper Woodland	**Burned Sagebrush of Dissected Slopes (E, W, S Aspects)**	**Burned Sagebrush of Dissected Slopes (N Aspects)**	**Juniper Woodland**	**Pinyon-Juniper Woodland**	**Mountain Mahogany Woodland**	**Basalt Sagebrush**
NATIVE SHRUBS							
Chrysothamnus viscidiflorus	5.20	2.57	10.50		P	P	1.00
Ephedra viridis				0.25	P		
Kochia prostrata		2.43					
Lycium sp.							
Prunus andersonii	P						
Ribes inerme					P		
Ribes velutinum			P			0.50	
Symphoricarpos longiflorus					P	2.67	
Tetradymia canescens							
TOTAL NATIVE SHRUBS	5.2	5.7	10.7	4.0	1.8	21.5	20.0
NATIVE TREES							
Juniperus osteosperma				10.50	9.63	0.50	
Pinus monophylla				P	11.75	2.83	
TOTAL NATIVE TREES				10.5	21.4	3.3	
SUCCULENTS							
Opuntia phaeacantha					P		
TOTAL SUCCULENTS					0.0		
PARASITE							
Orobanche fasciculata							
TOTAL PARASITE							

*P= Present within 1m of either side of the cover transect, but not quantitatively encountered.

Table 1. Vegetation of All Areas by Percent Absolute Cover, HC/CUEP, Eureka and Lander Counties, NV - Barrick Gold Exploration, Inc.

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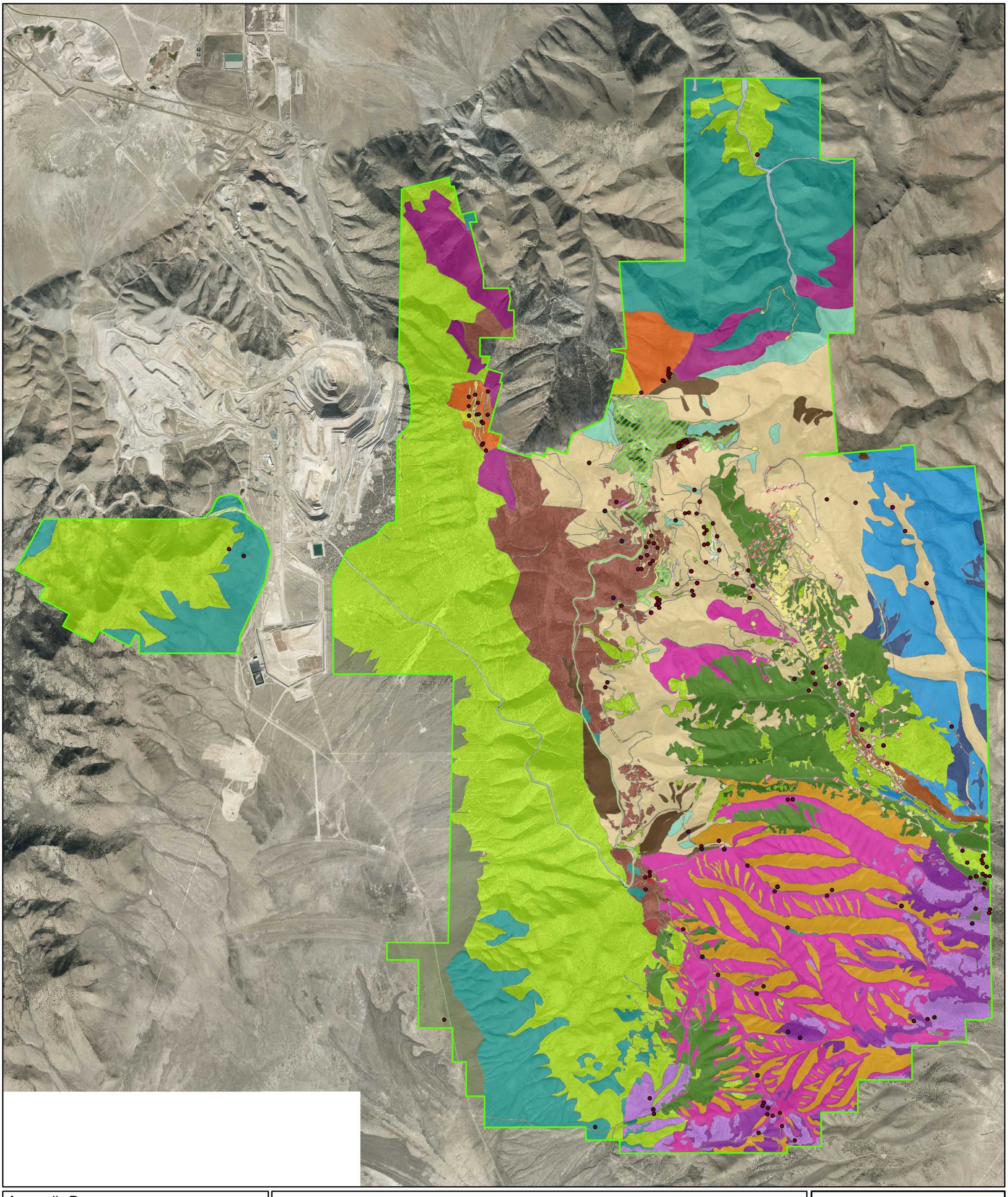
MUSHROOMS							
Fungus				P			
TOTAL MUSHROOMS				0.0			
Standing dead	1.60	0.86	2.17	4.75	1.50	2.50	5.00
Litter	32.60	18.71	20.17	14.75	23.50	18.83	4P
Bare ground	20.40	21.29	18.00	34.25	23.50	13.67	22.00
Rock	4.40	6.14	1.17	27.25	25.25	17.00	6.00
TOTALS	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL VEGETATION COVER	41	53	59	19	26	48	27
GROUND COVER (Litter+Rock+Veg+St.Dead)	79.6	78.7	82.0	65.8	76.5	86.3	78.0
SPECIES DENSITY (# of species/100 sq.m.)	20.0	16.4	21.2	23.3	19.3	29.5	
Standard Deviation	3.5	2.9	3.1	3.9	4.1	4.8	22
Number of Samples	5	7	6	4	8	6	1

*P= Present within 1m of either side of the cover transect, but not quantitatively encountered.



Appendix D
Vegetation Types and
Sample Locations 2009-2014
HC/CUEP Plan of Operations (PoO)

Barrick HC/CUEP
Eureka and Lander Counties, NV
Map Date: 11/6/2014

0.7 1.4 Kilometers

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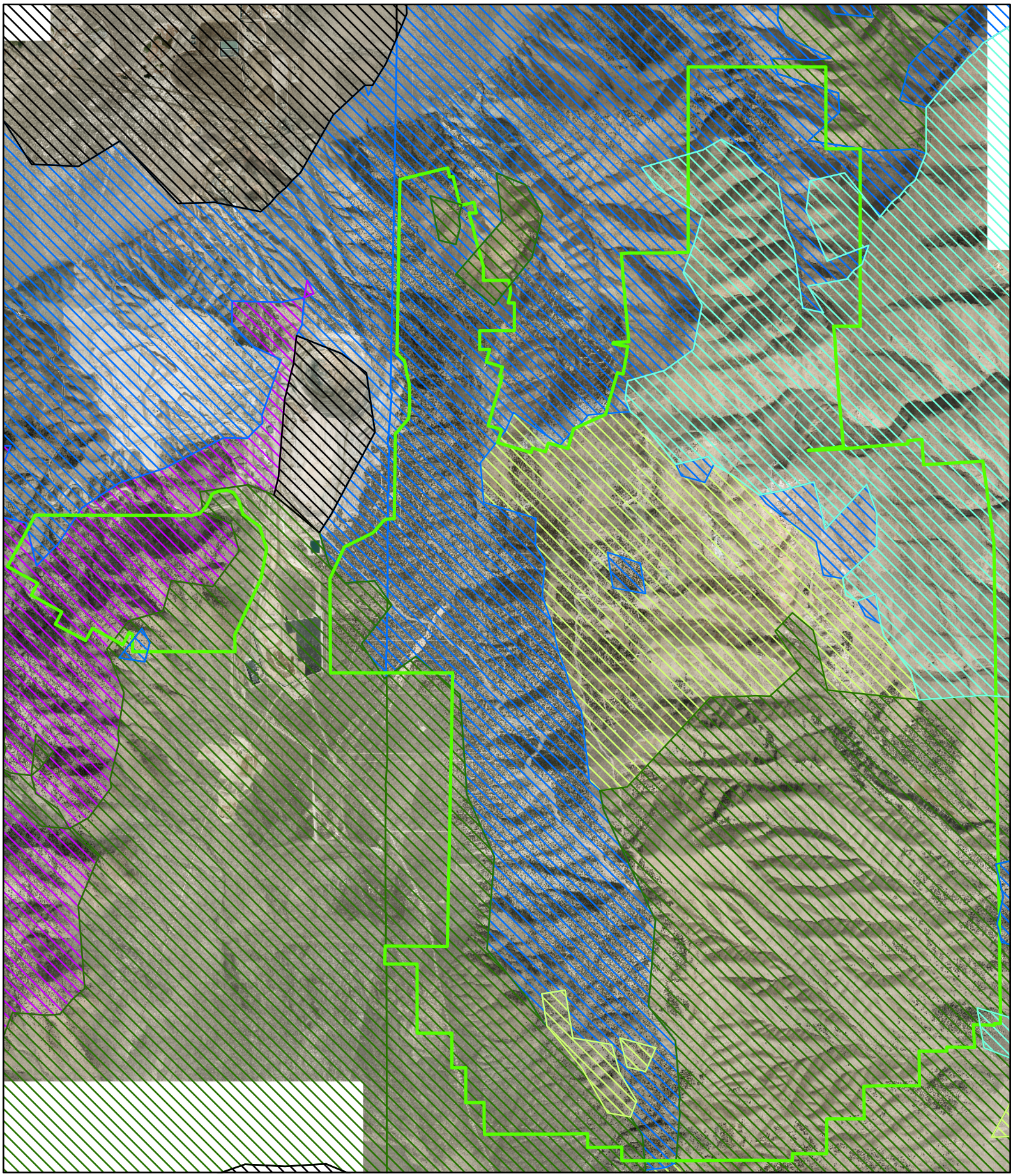
ESCO Associates Inc.



Appendix E.
Sage Grouse Habitat Categories
(NV Department of Wildlife)
HC/CUEP PoO

Barrick HC/CUEP
Eureka and Lander Counties, NV

Project Boundaries
- HCCUEP PoO

Habitat Categories
- Essential/Irreplaceable Habitat, 1
- Important Habitat, 2
- Habitat of Moderate Importance, 3
- Low Value Habitat/Transitional Range, 4
- Unsuitable Habitat, 5
- Non-Habitat, N/A

2013 Aerial Imagery Provided by Barrick

0 2,000 Meters

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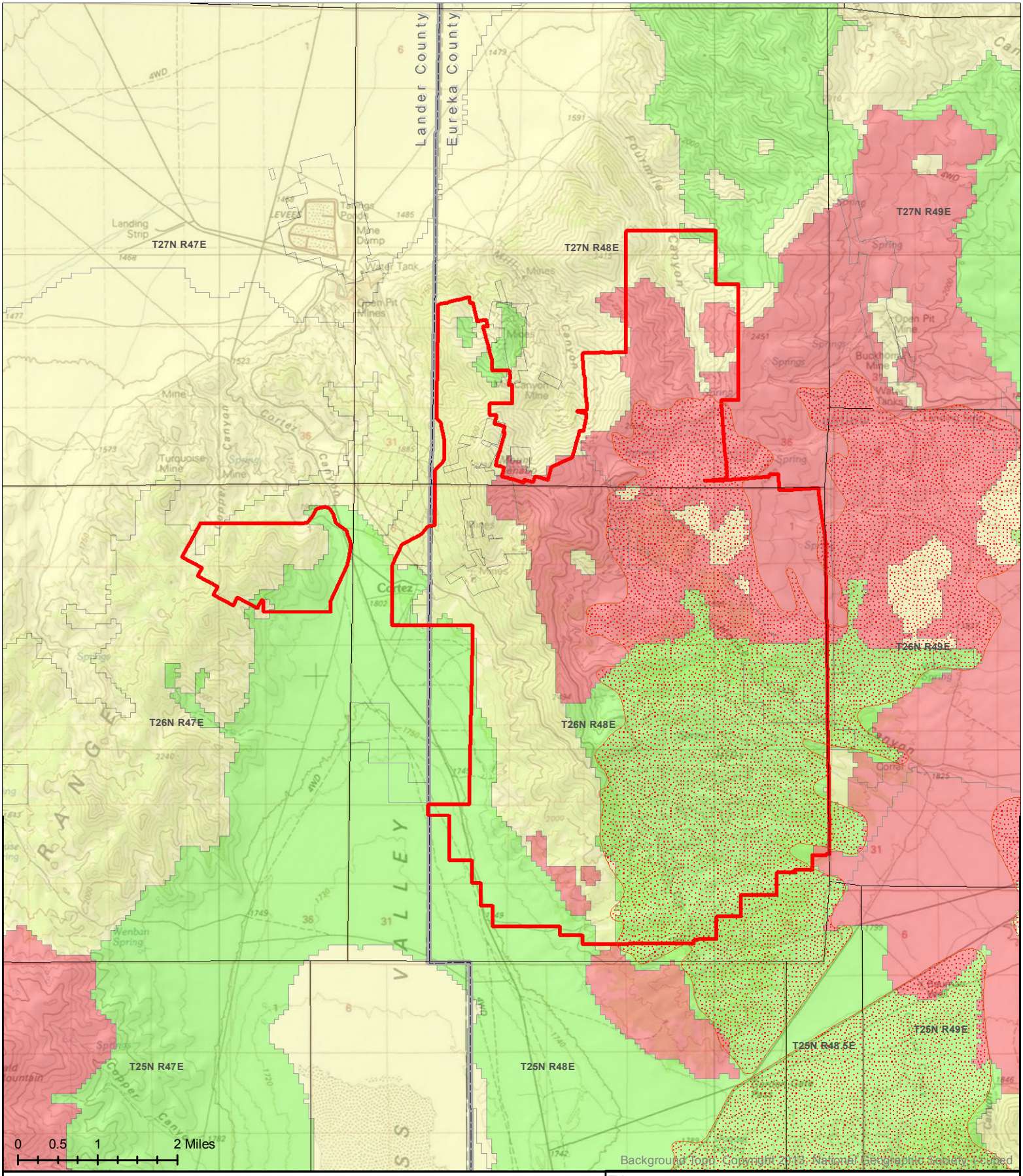
ESCO Associates Inc.



Legend

- HC/CUEP Boundary
- Township Range
- County Boundaries
- 1999 Fire

Greater Sage-grouse Habitat Category*

- Low Value
- Preliminary General Habitat (PGH)
- Preliminary Priority Habitat (PPH)

*Source: BLM reclassification of NDOW Habitat Categorization (March 2012)

1:100,000

N

Title: **Figure 3.1**
Greater Sage-grouse Habitat

Project: Barrick Gold Exploration, Inc.
Horse Canyon/Cortez Unified Exploration Project

Location:	*Map By:*	*Date:*
T26N, R48E; T27N, R48E; T26N, R47E Eureka/Lander Counties, NV	WR	4/21/2014

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MEMORANDUM OF UNDERSTANDING

United States Department of Interior
Bureau of Land Management-Nevada State Office

United States Department of Agriculture, United States Forest Service, Humboldt-Toiyabe National Forest,

Nevada Department of Conservation and Natural Resources,

and

Barrick Gold of North America, Newmont Mining Corporation, and Other Companies

MEMORANDUM OF UNDERSTANDING

Among

THE U. S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, NEVADA STATE OFFICE

THE UNITED STATES DEPARTMENT OF AGRICULTURE, UNITED STATES FOREST SERVICE, HUMBOLDT-TOIYABE NATIONAL FOREST,

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

And

BARRICK GOLD OF NORTH AMERICA, NEWMONT MINING CORPORATION, and OTHER COMPANIES

Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat

I. PURPOSE

This Memorandum of Understanding ("MOU") establishes a formal partnership among BLM Nevada ("BLM"), Humboldt-Toiyabe National Forest ("HTNF"), the Nevada Department of Conservation and Natural Resources ("DCNR") (together the "Agencies") and Barrick Gold of North America (including its US affiliates and subsidiaries), Newmont Mining Corporation (including its US affiliates and subsidiaries), and other members of the Nevada Mining Association as may choose to execute this Agreement (together the "Companies"). Collectively, the Agencies and Companies shall be referred to as the "Parties."

This MOU provides a consultation process for proposed mining projects occurring in sage-grouse preliminary priority habitat ("PPH") and preliminary general habitat ("PGH") located on federal lands. This process will guide the design and implementation of appropriate and consistent action to avoid, minimize, or mitigate adverse impacts to Greater Sage-grouse and Greater Sage-grouse habitat associated with mining exploration and development.

This MOU is consistent with BLM Washington Office Instructional Memorandum No. 2012-043, entitled Greater Sage-Grouse Interim Management Policies and Procedures, and Nevada BLM Instructional Memorandum No. NV-2012-058, entitled Revised Direction for Proposed Activities within Greater Sage-Grouse Habitat and the Forest Service (Regions 1, 2 and 4) "Interim Conservation Recommendations for Greater Sage-Grouse and Sage-Grouse Habitat" dated October 2, 2012.

II. PROCEDURES

A. The BLM is responsible for the administration and management of public lands. The BLM will be the lead agency in the National Environmental Policy Act ("NEPA") processes as described by 40 C.F.R. §§ 1501.5, 1508.16 and 43 CFR part 3809 for evaluation, analysis, and processing of Plans of Operation and mining exploration Notices of Intent within BLM administered lands.

B. The HTNF is responsible for the administration and management of National Forests. The HTNF will be the lead agency in the NEPA process as described by 40 C.F.R. §§ 1501.5, 1508.16 and 36 CFR 228 Subpart A for evaluation, analysis, and processing of Plans of Operation and mining exploration Notices of Intent within National Forest administered lands.

C. The DCNR is responsible for the administration of mining exploration and development on private and state lands.

D. The Parties agree to become cooperating partners in the formation of the BLM Nevada, Humboldt-Toiyabe National Forest, DCNR, and Nevada mining industry Greater Sage-grouse conservation partnership and in the NEPA process for plans of operation or mining exploration notices on public lands. DCNR will participate as a cooperating agency under 40 CFR §§ 1501.6, 1508.5, 43 CFR part 3809, and 36 CFR 228 Subpart A. Individual mining companies will participate as project applicants in the NEPA processes for their own Plans of Operation or mining exploration Notices of Intent.

E. All Parties agree to:

   i. Adhere to and comply with the applicable laws and regulations of the United States and regulations of the Secretary of the Interior and Secretary of Agriculture, for areas under their respective jurisdictions.

   ii. Meet as needed on mutually agreed dates to review and evaluate current conditions and trends as well as the implementation of this MOU. These meetings will also serve as coordination sessions to determine immediate and future timing requirements and the general programming of cooperative actions.

   iii. Implement the state consultation requirements of BLM NV Instructional Memorandum No. 2012-058 through this MOU for mining projects. This MOU provides that the consultation process will involve a collaborative approach among the Parties on a project basis.

   iv. Support and implement appropriate sage-grouse monitoring and mitigation for mining related activities in PPH and PGH on federal lands. Through the NEPA process for Plans of Operation or through the development of mining exploration Notices of Intent, the Agencies will consult with the Parties to identify and implement appropriate monitoring and mitigation for mining exploration and development on BLM and HTNF lands in Nevada, consistent with the interim management direction for PPH and PGH. The goals for project development include, but are not limited to: (a) Avoidance and minimization of sage-grouse

habitat disturbance where practicable, recognizing existing mineral rights and authorizations; (b) Offsetting, or mitigation where avoidance is not practicable; and (c) Establishment of sage-grouse mitigation bank(s).

v. For mining projects on federal lands not previously approved by the appropriate Agency, provide for restoration, mitigation, or offsetting of potential impacts on sage-grouse. The final determination of the effects that require restoration, mitigation, and offsetting shall be accomplished through site specific analysis and/or addressed in a NEPA compliant document. In determining any requirements, the Agencies shall consider the recommendations of an evaluation committee consisting of representatives of the project, the federal land management agency, and the State Sage-Grouse Technical Team. Such determinations shall be guided by the following principles:

a. No restoration, mitigation, or offset would be required where site specific analysis establishes that there will be no negative effects to sage-grouse or its habitat, even in areas that have been designated on maps as PPH or PGH. Such analysis would be conducted by a qualified biologist with sage-grouse experience and agreed to by the relevant Parties. The analysis would include an evaluation of the use of the site by sage-grouse during its life cycle. In order to reach a conclusion that no restoration, mitigation, or offsetting is required in an area previously designated as PPH or PGH, the analysis must be conducted prior to any disturbance and must account for any projected changes in sage-grouse behavior as a result of the activity proposed. Attachment A (Sage-Grouse Habitat Assessment Framework) hereto describes one acceptable approach to such site-specific analysis. Other methods or procedures, including without limitation streamlining of data requirements, may be considered on a case-by-case basis.

b. Site reclamation plans may include specific measures designed to provide for restoration/rehabilitation or improvement of sage-grouse habitat during the reclamation process. Where such reclamation is found to adequately address some or all of the impacts on Greater sage-grouse, the required mitigation or offsetting may be reduced or eliminated.

c. Where reclamation is infeasible or will not, by itself, adequately address all impacts on Greater Sage-grouse, any excess impact not addressed by reclamation will be offset or mitigated as provided in a plan approved by the appropriate federal Party, consistent with the objective of no unmitigated net loss and the following principles:

i. Offset at a ratio of 1 to 1 by providing long-term assurances, acceptable to the land management agency and in place prior to the disturbance, for the protection, management, and conservation of comparable habitat on private land. For purposes of this Agreement, "comparable" shall refer to habitat

of the same (or better) kind and quality, to the satisfaction of the land management agency.

ii. Mitigated by the project proponent at ratios of no more than 3 to 1 for PPH-quality habitat and 2 to 1 for PGH-quality habitat. Notwithstanding these mitigation targets, it is understood and agreed that the Agencies may approve alternative mitigation proposals where the net benefit to sage-grouse conservation meets or exceeds the benefit that would be achieved by performing traditional acre for acre mitigation. For example, but without limitation, it is agreed that fire control, focused improvements to high value habitat areas, and other projects may have great benefit to sage-grouse that is not easily correlated to per acre mitigation ratios.

iii. Mitigated by the project proponent providing payment to a sage-grouse mitigation bank account or other program approved by DCNR and the appropriate federal land management agency in an amount equal to the cost of satisfying the target mitigation ratios set forth above. Costs for making such improvements on private lands shall be based on the Nevada Standardized Reclamation Cost Estimator (SCRE) model. SCRE shall also provide the basis for negotiating costs for public lands, which will also include cost of NEPA compliance.

iv. Without limitation, mitigation measures may include habitat restoration/rehabilitation, vegetation management, fencing of springs and meadows, thinning or removal of woodland vegetation in sagebrush communities, creating fuel breaks to protect intact sagebrush communities, noxious weed treatments, and supplemental (*i.e.*, not baseline) GPS or telemetry sage-grouse population monitoring. Mitigation/offsetting may be performed on or off-site, on either private or public lands, subject to appropriate mechanisms for assuring that off-site mitigation projects will maintain adequate protections.

vi. Continue to work toward development of a program for and establishment of a sage-grouse mitigation bank(s) across all land ownerships and jurisdictions. The Parties will identify potential habitat to be included in a mitigation bank(s); a program for implementing restoration/rehabilitation, reclamation, and enhancement activities on banked land; a system for validating, tracking, and monitoring the success of mitigation efforts on Greater Sage-grouse populations; mechanisms for assuring adequate protection of projects; and an accounting system for banked credits.

vii. Support the development and application of state and transition models for ecological sites to assess Greater Sage-grouse habitat values and optimize Greater Sage-grouse restoration/rehabilitation, reclamation, and enhancement efforts. Modeling will be used, if available, during the NEPA process and during consultation with the Parties to assess habitat disturbance and identify appropriate mitigation measures. Modeling may also be used to identify potential land for a mitigation bank(s) and provide a metric for assigning values to habitat restoration/rehabilitation, reclamation, and enhancement activities within the bank(s).

viii. Greater Sage-grouse related data that becomes available through site-specific surveys, remote sensing data, state and transitional models, or other sources will be provided to and stored in a central location acceptable to the relevant Parties. The appropriate protocols and location of the data storage will be coordinated by the State Sage-Grouse Technical Team.

ix. Consistent with this MOU, offsetting/mitigation, including any monitoring or other requirements, to address impacts to Greater Sage-grouse from mining projects on federal lands will be developed through the NEPA process and issued as a condition of project approval.

III. AUTHORITIES

A. The following Legislative Authorities apply to the BLM and will apply to other subsequent and mutually agreed to instruments:

i. The Taylor Grazing Act of June 28, 1934, (43 U.S.C. § 315 *et seq.*), as amended.

ii. General Mining Law of 1872 (30 U.S.C. § 22 *et seq.*), as amended.

iii. The Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1737(b)).

iv. The Public Rangelands Improvement Act of 1978 (43 U.S.C. § 1901 *et seq.*).

v. National Environmental Policy Act of 1969 (42 U.S.C. § 4321 *et seq.*).

B. The following Legislative Authorities apply to the HTNF and will apply to other subsequent and mutually agreed to instruments:

i. National Forest Management Act of 1976 (16 U.S.C. §§ 1600-1614), as amended.

ii. General Mining Law of 1872 (30 U.S.C. § 22 *et seq.*), as amended.

iii. The Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1737(b)),

iv. National Environmental Policy Act of 1969 (42 U.S.C. § 4321 *et seq.*).

C. The following Legislative Authorities under this MOU apply to DCNR, for its participation as a NEPA cooperating agency, and to the Companies for participation as project applicants: NRS 232.070(3).

IV. ADMINISTRATION

A. It is mutually agreed and understood by all Parties that:

i. Nothing in this MOU will be construed as affecting or restricting the legal authorities of the Parties or as binding beyond their respective authorities, or to obligate the federal agencies to any current or future expenditure in advance of appropriations from Congress. Nor does this agreement obligate or require the United States, through BLM or NTNF, or the State of Nevada to expend funds on any particular project or purpose, even if funds are available.

ii. Any information furnished to the BLM, HTNF, or other Parties during and related to the NEPA process may be subject to disclosure under the Freedom of Information Act (5 U.S.C. § 552), unless covered by a relevant exception (e.g., for confidential commercial or financial information (5 U.S.C. § 552(b)).

iii. This MOU in no way restricts the BLM, HTNF, DCNR, or the Companies from participating in similar activities with other public or private agencies, organizations, and individuals.

iv. Nothing in this MOU shall obligate the BLM, HTNF, DCNR, or the Companies to obligate or transfer any funds. Specific work projects or activities that involve the transfer of funds, services, or property among the various agencies and offices of the BLM, HTNF, DCNR, and the Companies shall require execution of separate agreements consistent with law and any funds provided by the government agencies pursuant to their legal authorities will be contingent upon the availability of appropriated funds. All funded activities must be independently authorized by appropriate statutory authority as this MOU does not provide such authority. Negotiation, execution, and administration of each such agreement must comply with all applicable statues and regulations.

v. This MOU is not intended to and does not create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity, by a party against the United States, its agencies, its officers, or against the State of Nevada or any other person.

vi. Conflicts between the Parties concerning procedures under this MOU, which cannot be resolved at the operational level, will be referred to successively higher levels as necessary for resolution.

vii. Upon request by any of the Parties, each Party shall review this MOU to assure that it continues to reflect the appropriate understandings and procedures to provide for current needs and capabilities and adherence to the Public Laws.

viii. The terms of this MOU may be renegotiated at any time at the initiative of any Party. Any Party may propose changes to this MOU during its term by providing 30-day written notification to the other Parties. Such changes will be in the form of an amendment and will become effective upon signature by the Parties.

ix. The Federal Government's liability shall be governed by the provisions of the Federal Tort Claims Act (28 U.S.C. §§ 2671-80). The Parties shall operate in conformance with the Code of Federal Regulations and the United States Code.

x. The Parties shall comply with all Federal Statutes relating to nondiscrimination. These include but are not limited to: a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d), which prohibits discrimination on the basis of race, color, handicap, or national origin; b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-16783, §§ 1685-1686), which prohibits discrimination on the basis of sex.

xi. Any Party may terminate its involvement under this MOU upon providing a 30-day written notice of such termination to the other Parties.

xii. Unless otherwise provided, this agreement is not intended to supersede provisions of other agreements between the Parties, in whole or in part, unless there is a conflict between the two agreements.

xiii. FEDERAL IDENTIFIER NUMBER. For the purposes of the HTNF, the Federal Identifier Number is **13-MU-11041730-040**.

xiv. SUPPLEMENTAL PROVISIONS. The U.S. Forest Service (HTNF) Supplemental Provisions are hereby incorporated into and made part of the Memorandum of Understanding among the BLM, HTNF, DCNR, and the Companies regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat.

xv. NON-FEDERAL STATUS FOR COOPERATOR PARTICIPANT LIABILITY. DCNR and the Companies agree that any of their employees, volunteers, and program participants shall not be deemed to be Federal employees for any purposes including Chapter 171 of Title 28, United States Code (Federal Tort Claims Act) and Chapter 81 of Title 5, United States Code (OWCP), as DCNR and the Companies hereby willingly agree(s) to assume these responsibilities.

Further, DCNR and the Companies shall provide any necessary training to DCNR and the Companies' employees, volunteers, and program participants to ensure that such personnel are capable of performing tasks to be completed. DCNR and the Companies shall also supervise and direct the work of its employees, volunteers, and participants performing under this agreement.

xvi. ASSURANCE REGARDING FELONY CONVICTION OR TAX DELINQUENT STATUS FOR CORPORATE ENTITIES. This agreement is subject to the provisions contained in the Department of Interior, Environment, and Related Agencies Appropriations Act, 2012, P.L. No. 112-74, Division E, Section 433 and 434 regarding corporate felony convictions and corporate federal tax delinquencies. Accordingly, by entering into this agreement the Companies acknowledges that it: 1) does not have a tax delinquency, meaning that it is not

subject to any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, and (2) has not been convicted (or had an officer or agent acting on its behalf convicted) of a felony criminal violation under any Federal law within 24 months preceding the agreement, unless a suspending and debarring official of the United States Department of Agriculture has considered suspension or debarment is not necessary to protect the interests of the Government. If any of the signatory mining Companies fails to comply with these provisions, the U.S. Forest Service will annul this agreement and may recover any funds the Companies have expended in violation of sections 433 and 434.

xvii. MEMBERS OF U.S. CONGRESS. Pursuant to 41 U.S.C. 22, no U.S. member of, or U.S. delegate to, Congress shall be admitted to any share or part of this agreement, or benefits that may arise therefrom, either directly or indirectly.

xviii. NOTICES. Any communications affecting the operations covered by this agreement given by the U.S. Forest Service or the Parties is sufficient only if in writing and delivered in person, mailed, or transmitted electronically by e-mail or fax, as follows:

To the Principal Contact(s) listed in Section IV(A)(xxii).

Notices are effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

xix. DEBARMENT AND SUSPENSION. The Cooperator shall immediately inform the U.S. Forest Service if they or any of their principals are presently excluded, debarred, or suspended from entering into covered transactions with the federal government according to the terms of 2 CFR Part 180. Additionally, should the Cooperator or any of their principals receive a transmittal letter or other official Federal notice of debarment or suspension, then they shall notify the U.S. Forest Service without undue delay. This applies whether the exclusion, debarment, or suspension is voluntary or involuntary.

xx. This MOU documents a framework for cooperation between the HTNF and the other Parties for carrying out their separate activities in a coordinated and mutually beneficial manner where nothing of value transfers between the Parties. The Parties direct their own activities, use their own resources and funding, and do not expect any deliverable by the HTNF and the other Parties. Nothing in this MOU commits the HTNF to future projects or any future obligation.

xxi. ENDORSEMENT. Any of the Parties' contributions made under this MOU do not by direct reference or implication convey U.S. Forest Service endorsement of the Parties' products or activities.

xxii. PRINCIPAL CONTACTS. Individuals listed below are authorized to act in their respective areas for matters related to this agreement.

Principal DCNR Contacts:

DCNR Program Contact	DCNR Administrative Contact
Name: Jim Lawrence Address: 901 S Stewart St, Suite 5003 City, State, Zip: Carson City, NV 89701 Telephone: 775-684-2720 FAX: Email: Lawrence@lands.nv.gov	Name: Tim Rubald Address: 901 S. Stewart St, Suite 1003 City, State, Zip: Carson City, NV 89701 Telephone: 775-684-2764 FAX: Email: timrubald@sagebrusheco.nv.gov

Principal BLM Contacts:

BLM Program Contact	BLM Administrative Contact
Name: Raul Morales Address: 1340 Financial Blvd City, State, Zip: Reno, NV 89502 Telephone: 775-861-6464 FAX: 775-861-6712 Email: rmorales@blm.gov	Name: Kenda Tucker Address: 1340 Financial Blvd City, State, Zip: Reno, NV 89502 Telephone: 775-861-6417 FAX: 775-861-6634 Email: ktucker@blm.gov

Principal Companies Contacts:

Companies Program Contact	Companies Administrative Contact
Name: Tim Crowley, President, Nevada Mining Association Address: 201 West Liberty St City, State, Zip: Reno, NV 89501 Telephone: 775-829-2121 FAX: 775-852-2631 Email: Tim@nevadamining.org	Name: Address: City, State, Zip: N/A Telephone: FAX: Email:

Principal HTNF Contacts:

HTNF Program Manager Contact	HTNF Administrative Contact
Name: Tom Frolli, Natural Resources & Planning Officer Address: 1200 Franklin Way City, State, Zip: Sparks, NV 89431 Telephone: 775-355-5313 FAX: 775-355-5398 Email: tfrolli@fs.fed.us	Kevin Worth, Grants Management Specialist Southwest ID & NV Acquisition Center 1249 S Vinnell Way, Suite 200 Boise, ID 83709 Telephone: (208) 373-4295 FAX: (208) 373-4294 Email: kworth@fs.fed.us

The authority and format of this agreement have been reviewed and approved for signature. 13-MU-11041730-040

7/8/13

KEVIN WORTH
U.S. Forest Service Grants Management Specialist

Date

V. APPROVALS

This MOU will become effective upon the last date of signature between the Parties and shall remain in effect for 5 years or until the issuance of a Record of Decision approving BLM and HTNF's California-Nevada Greater Sage-Grouse Sub-regional Resource Management Plan Amendments, as contemplated by IM No. 2012-044, whichever is sooner. ***This MOU may be amended to include additional participating Companies as deemed appropriate by the signatory agencies.***

7/8/13

Amy Lueders
State Director, Nevada
Bureau of Land Management

Date

William Dunkelberger
Forest Supervisor, Humboldt-Toiyabe National Forest
United States Forest Service

Date

Leo Drozdoff
Director
Nevada Department of Conservation and Natural Resources

Date

The authority and format of this agreement have been reviewed and approved for signature. 13-MU-11041730-040

7/8/13

KEVIN WORTH
U.S. Forest Service Grants Management Specialist

Date

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This MOU will become effective upon the last date of signature between the Parties and shall remain in effect for 5 years or until the issuance of a Record of Decision approving BLM and HTNF's California-Nevada Greater Sage-Grouse Sub-regional Resource Management Plan Amendments, as contemplated by IM No. 2012-044, whichever is sooner. ***This MOU may be amended to include additional participating Companies as deemed appropriate by the signatory agencies.***

Amy Lueders
State Director, Nevada
Bureau of Land Management

Date

Jack Isaacs

7/18/13

for William Dunkelberger
Forest Supervisor, Humboldt-Toiyabe National Forest
United States Forest Service

Date

Leo Drozdoff
Director
Nevada Department of Conservation and Natural Resources

Date

The authority and format of this agreement have been reviewed and approved for signature. 13-MU-11041730-040

7/8/13

KEVIN WORTH
U.S. Forest Service Grants Management Specialist

Date

V. APPROVALS

This MOU will become effective upon the last date of signature between the Parties and shall remain in effect for 5 years or until the issuance of a Record of Decision approving BLM and HTNF's California-Nevada Greater Sage-Grouse Sub-regional Resource Management Plan Amendments, as contemplated by IM No. 2012-044, whichever is sooner. ***This MOU may be amended to include additional participating Companies as deemed appropriate by the signatory agencies.***

Amy Lueders
State Director, Nevada
Bureau of Land Management

Date

William Dunkelberger
Forest Supervisor, Humboldt-Toiyabe National Forest
United States Forest Service

Date

7/9/13

Leo Drozdoff
Director
Nevada Department of Conservation and Natural Resources

Date

July 24/13

Gary Halverson
President
Barrick Gold of North America

Date

Tom Kerr
Senior Regional Vice President – North American Region
Newmont USA Limited

Date

Gary Halverson
President
Barrick Gold of North America

Date

07-15-13

Tom Kerr
Senior Regional Vice President – North American Region
Newmont USA Limited

Date

AUTHORIZED REPRESENTATIVE. By signing below, the President of the Nevada Mining Association (NvMA) certifies as being an authorized representative to sign on behalf of all members of NvMA who shall be and are a participating party to this Memorandum of Understanding (MOU), FS Agreement #13-MU-11041730-040. It shall be the responsibility of the President of NvMA to maintain a current and accurate list of the legal names of all members of NvMA who are a participating party to this MOU. At the request of a party to this MOU, the President of NvMA shall provide that party with a current and accurate list of the legal names of all members of NvMA who are a participating party to this MOU within 30 days of such request.

Tim Crowley

TIM CROWLEY, President
Nevada Mining Association

8-21-13
Date

$ SSHQGL) 5 HVSRQVHVWR &RPP HQW 5 HFHLYHG

7KHSXEOLF FRP P HQWSHULRG IRUWKH+&&8 (3 ($ HQGHG-DQXDU &RP P HQWZ HUH
UHFHLYHG IURP WKH1HYDGD' HSDUW HQWRI : LOGOLIH 1 ' 2 : RQ' HFHP EHU WKH1HYDGD
6WDWH&RDOLWLRQ KRXVH6WDWH/ DQG8 VH3OQQLQJ $ J HQF\ RQ-DQXDU WKH(XUHND&RXQW
%RDUG RI &RP P LVVLRQHUVRQ-DQXDU DQG IURP * UHDW%DVLQ5 HVRXUFH: DWK RQ-DQXDU
&RP P HQWVDQG UHSRQHVWR VXEWDQWLYH SXEOLF FRP P HQWDUHLQFOXGHG LQ WKLV
DSSHQGL[,QGLYLGXDOXEWDQWLYHRUDFWRQDEOHFRP P HQWWKDWZ HUHLGHQWLIHG LQ HDFK OHWWHUKDYH
EHHQ LQFOXGHG 7KHFRP P HQWVDQG UHSRQHVDUHRU DQ]HG XQGHUDKHDGLQJ FRQWLQLQJ WKH
QDP HDJHQF\ RI WKHFRP P HQWU 7KHFRP P HQWDUHUHSULQWG LQ EROG IRORZ HG E\ %/0
UHSRQHV &RP P HQWIURP * UHDW%DVLQ5 HVRXUFH: DWK VKRZ Q EHORZ Z HUHVXP P DU]HG E\
%/0 WR LGHQW\ VXEWDQWLYH HOHP HQWWR DGGUHVVLQ UHSRQHV

(XUHND &RXQW %RDUG RI &RP P LVVLRQHUV

**&RP P HQW 3DJH WKURXJK * UHDWU6DJH* URXVH : HIIQG WKH(30 VWR EH
SRWQWDO) FRXQWU WR WKH1HYDGD &RQVHUYDWRQ &UHGLW6\ VWP &&6 3OHDVHUHYDOXDW
DQG FRQVLGHUSDLLQJ IRUFRQVVWQF\ DQG IP SOHP HQWDWRQ RI WKH&&6**

5HVSRQVH (QYLURQP HQWDOSURWFWRQP HDXXUHV (30 V IRUVDJHJURXVHZ HUHGHYHORSHG EDVHG RQ
FXUUHQW%/0 P DQDJHP HQW XLGDQFH %/0 DQG P DQDJHP HQWSUDFWFHV DQG DVRXWQHG LQ
WKH0 HP RUDQGXP RI 8QGHUWWQGLQJ 0 28 5HJDUGLQJ WKH(VWEOLKP HQWRI D3DUWHVKLS IRUWKH
&RQVHUYDWRQ DQG 3URWFWRQ RI WKH* UHDWU6DJH * URXVH DQG * UHDWU6DJH * URXVH+ DEIWW%/0
HWDO %DUUFN IVFXUHQW Z RUNLQJ RQ DQ DJUHP HQWZ IWK WKH' HSDUW HQWRI WKH,QWUURU
' 2, FRQFHUQLQJ VDJHJURXVH 7KH) IQDO($ KDVIQFRUSRUDWG UHFHQW XLGDQFH IRXQG IQ,0 19
) HEUXDU Z KIFK IQFRUSRUDWV UHYLVHG KDEIWWP DSSIQJ E\ 8 6 * HRQRJ IF
6XUYH &RDWVHWDO 7KHUHYLVHG P DSSIQJ VKRZ QIQ WKH($) LJ XUH D IQFRUSRUDWV
XSGDWG WDP HW GDW OQGVFDSHKDEIWWP DSSIQJ IQFXGLQJ YHJ HWDWRQ P DSSIQJ WSRJ UDSK\
DQG OQG IHDXUHV DQG OHN GDW

**) XUWHU IQWXOWDWRQ RI IQJKWGHWUHQWKDYHEHQ IRXQG WR RQ) EHHIIHFWYH II SOHFHG
WDWWXIFDO) DQG DVD Z DWWRI UHRXUFHVII QRW6WWHQVHWDO 3OHDVHIQFRUSRUDWXVH
RI WKH1 5&6 6DJH* URXVH) HQFH&RQWRQ5 IVN 7 RRQWKHS IQ GHWUP IQIQJ DUHDVIRU
IQWXOWDWRQ RI IQJKWGHWUHQWIQ RUGHU WR XVHUHRXUFHVZ IVHD DQG JHWWKHEIJ JHWUHXUQ
RQ IQYHWW HQW**

5HVSRQVH 8VHRI IQJKWGHWUHQWIVRQHRSWRQ WR P IQIP I]HHIIHFW WR J UHDWUVDJH J URXVH
) QJKWGHWUHQWZ RXOG EH XVHG DQG SOHFHG EDVHG RQ%/0 HYDOXDWRQ DQG FRQVGHUDWRQ RI
HIIHFW WR J UHDWUVDJH J URXVH 7KH1 5&6 WRROP D\ EH XVHG WR GHWUP IQHDUHDVIRUIQWXOWDWRQ RI
IQJKWGHWUHQW

**: HDOR DVN WKDWDOOZ IQGOLHP IWJDWRQ SURWFW EHFRRUGIQDWG Z IWK WKH&RXQW WKH
&RXQW $ GYLVRU\ %RDUG WR 0 DQDJH: IQGOLH DQG WKH(XUHND&RQVHUYDWRQ' IVWUFW: H
KDYHEHHQ IP SOHP HQWQJ P DQ\ Z IQGOLHKDEIWWHQKDQFHP HQWSURWFW SUP DUL) IRUVDJH**

JURXVH DQG ZHZ LVK WR OHDYH DJHRXU UHUHRXUFHV DQG SURWHFW ZLWK %DUUIFN DQG % 0 IRU VV QHUJ

5HVSRQVH 7KDQN\RX IRU\RXUFRP P HQW%/ 0 DQG %DUUIFN FRRUGLQDWH ZLWK (XUHND &RXQW RQ D URXWQHEDVV WKURXJK &RXQW P HHWQJ SDUWFLSDWRQ DQG RWKHUSHURGIF FRP P XQLFDWRQV**

&RP P HQW 3DJH DQG 3DJH 1 R[IRXV: HHGV 1 HVKHUWKH&RXQW QRUWKH: HHG ' LVWUFWDUHP HQWRQHG 3 OHDVHHQVXUHWKDWZ HHG WHDW HQWVDQG WKHZ HHG P DQDJHP HQWSODQ LVFRRUGLQDWHG ZLWK WKH&RXQW DQG WKH' LDP RQG9 DOOH : HHG &RQWURO ' LVWUFWWKDWKDVD VKDUHG WDXXWU\ DQG UHJXODWRU\ UHSRQMEIOLW IRUZ HHG FRQWURO

5HVSRQVH %/ 0 FRRUGLQDWHVZ LVK FRXQWHVDQG Z HHG FRQWROGLVWUFW $ SSURYDORI WKH+ & &8 (3 3OD QLQFOXGHVIP SOHP HQWWRQ RI DSURWHFWLSHFLIF Z HHG SOD %DUUIFN LVUHSRQMEOHIRU FRQWROOQJ QR[IRXVZ HHGVZ LWLQ WKH3OD QERXQGDU\ DFFRUGLQJ WX WKHSURWHFWZ HHG P DQDJ HP HQW SOD 7KH($ KDVEHHQ XSGDWG WX LQFOXGH WKH+ & &8 (3 Z HHG P DQDJ HP HQWSOD QDVDQ DSSHQGL[**

&RP P HQW 3DJH DQG 3DJH) RUHWW\ DQG: RRGDQG 5 HWRXUFHV 3OHDVHFRQVLGHU QR UHWWFWRQVRQ UHP RYDORI SLQ\ RQ SLQHRUXXQLSHUIQ DUHDVZ KHUHWKH WWHVDUHHQFURDFKLQJ LQWR DUHDVRXWLGHRI WKHUSURSHUHFRQRJIFDOWWWW

5HVSRQVH 7KDQN\RX IRU\RXUFRP P HQW 3LQ\RQ DQG XXLQSHUWHDW HQWZ RXOG EHIP SOHP HQWG Z LVK HP SKDVLVRQ HQFURDFKP HQWDUHDVIGHQWIHG DV3KDVH, DQG 3KDVH,, WX HQKDQFHJ UHDWUVDJ H JURXVHKDEITWW**

&RP P HQW 3DJH WKURXJK 6HHG 0 IL 7KHVHHG P IL HVDQG KDQG SODQWQJV GHVFUEHG IQ WKHWW[WDQG WXEOVDUHEDVHG SUIP DUO RQ HDYDWRQ 7KHUHIVQR GLVFXWIRQ DERXWDGXXWW HQWRI WKHVHHG P IL DQG SODQWQJVEDVHG RQ VRLOV VOXSH RUDVSHFW$ OWKRXJK WKHUHIVDQJXDJHDOWZ IQJ IRUDGXXWW HQWEDVHG RQ %/ 0 DSSURYDO WKHUHQHHGVWX EH OQJXDJHQRWQJ WKDWWKHVHG P IL P XWEHDGXXWWG DFFRUGLQJ WX HFRQRJIFDOFRQGLWRQVRWKHU WKDQ XXWHDYDWRQ

5HVSRQVH $ SSOFDWRQ WWQGDUGVRI %/ 0 DSSURYHG VHG P IL HVDUHSUIP DUO EDVHG RQ HDYDWRQ EXWDVWWWG IQ WKH($ DGXXWW HQWP D\ EHP DGHXSRQ DSSURYDOE\ WKH%/ 0 2 WKHUYDUIEOHV WKHFRP P HQWURXWQHVVXFK DVVRIOVDQG DSHFWUHFRQGHUHG E\ WKH%/ 0 IQ DQ\ VHG P IL WXUH DGXXWW HQW**

&RP P HQW 3DJH / LYHWWFN 5)) $: HDUHSX]]OHG DWWKH DFUHVRI³VXUDFH GLWXUEDQFH SURWHFWG IRUOHYHWWFN 7KLVIVQHDUO KDO RI WKH5)) $ DFUHDJH 7KH IRRWQRWWP HQWRQVVHGIQJ DFWXWWHVDQG RWKHUUDQJHDQG IP SURYHP HQWDQG RQO IQ WKH &DUIFR/ DNH$ OHRW HQW: KDWVWKHEUHDNGRZ Q RI DFUHDJHDOHRFDWWG WX OHYHWWFN" : K\ VXFK DKXJHQXP EHU" : HDUJXHWKDWWKHXVDJHRI DFUHVRI VXUDFHGLWXUEDQFHIRUHYHU\³H[LVWQJ DQG SURSRVHG OHYHWWFN Z DWU XVH Z DWU UJKWVDUEIWDU\ DQG QRWUHSUHVHQWWWYH

RI WXHVXUDFHGLWXUEDQFH / LQNLQJ DZ DWU UJKWWR VXUDFHGLWXUEDQFHLVGDQJHURXVDQG GLVLQJHQXRXV $ OR DGGLQJ GLWXUEDQFHDFUHDJHIRUIHQFHP DLQWDQFHDQG FDWWOH JXDUGVLV P LVSODFHG &DWWOH JXDUGVDUHSODFHG LQ DOHDG\ GLWXUEHG DUHDVDQG IHQFHVGR QRWFUHDW VXUDFHGLWXUEDQFHDORQJ WKHHQWUHQFH DQG YHU\ P LQLP DOVXUDFHGLWXUEDQFHZ KHQ LQWXOOG 3 OHDVHGR QRWP LI WKHP HDQLQJVRI VXUDFHHRFFXSDQF\ Z LWK VXUDFHGLWXUEDQFH

5 HVSRQVH 7 KDQN\ RX IRU\ RXUFRP P HQW6 XUDFHRFFXSDQF\ DQG VXUDFHGLWXUEDQFHDUHQRW P HDQWWR EHXVHG LQWUFKDQJ HDE\ ) RUWKHSXU$SRVHVRI HQYLURQP HQWODQD\ VLV DTXDQWLDE\H YDOXHZ DVXVHG 7 KLVLVFRQVLWWQWZ LWK WKHFXP XODWLYHDQD\ VLVFRQGXFWG IRUWKH&RUW] + LOOV) (,6 %/ 0 IURP Z KIFK WKH+ & &8 (3 ($ DQD\ VLV WHLVRII RI DQG H[SDQGV 7 KHWHLIQJ Z DVGRQHWX HDP LQDWUHGXQGDF\ LQ WKLVGRFXP HQW1 (3$ DQD\ VLV**

&RP P HQW 3 DJH : DWU5 HWRXUFHV : HWQG WR DJ UHHZ LWK WKHFRQFOXVRQV SURIIHUHG IQ ($ UHJDUGLQJ SRWQWDOIP SDFWWR Z DWU UHWRXUFHV SUIP DUO WKDW

- **7 KHDP RXQWRI JURXQGZ DWU WKDWLVOINHO WR EHFRQXP HG IQ WKHH[SORUDWU\ GUOOQJ SURJUDP IVVP DOODQG IVQRWH[SHFWG >WR@DIIHFWWKHTXDQWW RI JURXQGZ DWU UHWRXUFHV 7 KLVLVFRQVLWWQWZ LWK WKHHMGHQFHWR GDWWVKRZ IQJ QR IP SDFWWR JURXQGZ DWU UHWRXUFHVIURP WKHRQ JRIQJ H[SORUDWRQ DFWWYLWHV DWWKH+ & &8 (3**
- **2 WKHUDFWWYLWHV VSHFIIIFDOO GHZ DWUIQJ DWWKH&RUW] DQG 3 ISHDIQHRSHUDWRQV DUHVKRZ IQJ D P HDXUDEOHIHIHFWRQ Z DWU OHYHOVIQ WKHGHHSHUFDUERQDW DTXIIHU EXWQR FKDQJHVKDYHEHHQ REVHUYHG IQ WKHVKDOORZ HU QRQ FDUERQDW DTXIIHUVWR GDW**
- **&RQIRUP DQFHZ LWK 6 WDWWRI 1 HYDGD UHJXODWRQVZ IOOP IQIP I]HWKHSRWQWDO IRU GUOOQJ RSHUDWRQVWR DGYHUVHO IP SDFWJURXQGZ DWU TXDOW**
- **3URSRVHG %O 3 VZ IOOP IQIP I]HSRWQWDODGYHUVHIP SDFWWR VXUDFHZ DWU UHWRXUFHV**

5 HVSRQVH 7 KDQN\ RX IRU\ RXUFRP P HQW

&RP P HQW 3 DJH 9 HJHWDWRQ5 HWRXUFHV 7 KH($ WDWWV WKDWWKHYHJHWDWRQ IQ ³ QRUWKHDWLQ1 HYDGD IQFOXGIQJ WKH&RUW] 0 RXQWLQV KDVH[SHUIHQFHG VXEWWQWDO FKDQJHRYHU WKHSDW \ HDUV DQG WKHQ WWWW WKDWWKLVLV³ D UHWXOWRI Z IOGLILHDQ JUD]IQJ E\ GRP HWWF OOYHWWRFN´ : HGR QRWGLVSXWWWKDWZ IOGLILH DQG OOFN RI IILH KDVUHWXOWG IQ YHJHWDWRQ FKDQJHDQG OHJDF\ JUD]IQJ IP SDFWP D\ KDYHIQIOXHQFHG FKDQJH EXWWKH($ GRHVQRWTXDOI\ WKLVFRQFOXVRQ EDVHG RQ FXUUHQWUDQJHDQG VFIHQFH SUIP DUO (FRORJIFDO 6LWW' HWFUSWRQV (6' DQG WKHUDWRFLDWG 6 WDWWDQG 7 UDQWWRQ 0 RGHV 6 7 0 : H DJUHHWKDWWKHH[LWWQFHRI FKHDWUDWKDVVXEWWQWDO FKDQJHG WKHYHJHWDWRQ G\ QDP IFVRI WKHDUHD EXWZ HGR QRWDJUHHWKDWD SUIP DU\ FRQWP SRUDU\ GUYHURI YHJHWDWRQ FKDQJHIV

GXHVR OYHVRFN JUD]LQJ 7KLV($ LVQRWKHSODFHIRU%0 VRP DNHFRQHFXUHG WDVP HQW SRLQWQJ WKHLLQJHUDWOYHVRFN JUD]LQJ 0 DQ\ RI WKHHHDUHDVDUHLQ WWEOHWDVW DFFRUGLQJ VR(6' DQG WKHUDVRFLDWG 67 0 VDQG KDYHD FKDWUDWFRP SRQHQWEXWDUHQRW³VXEWDQWDOO FKDQJH' IVFRP SDULVRQ VR UHHLHQFHWDW(6') XUWKHU P XFK RI WKHFKDQJH LQ UHJDUGVVR WKHSUP DU\ OQDQ FRYHUWSHLQ WKHDUHD ± 3 - ZRRGODQG ± IVGXHVR ODFN RI LILH QRWH,VWQFHRI LILH

$ GGLWRQDOO 6HFWRQ DQG WKHDVRFLDWG 7DEOH DQG) LJXUH KLJKOJKW³DOWLDWRQVLQ YHJHWDWRQ FRP P XQLWHVGXHVR GLVXUEDQFHIURP ZLOGILHDVZ HO DV« H,SORUDWRQ DQG UHFOP DWRQ DFWYLWHV´ < HVWKHHIVQR GLVFXVVRQ RI DOWLDWRQVLQ YHJHWDWRQ FRP P XQLWHVEHFDXVHRI DQ DOWLHG LILHUHJLP H LH 3 - H,SDQVRQ DQG RU GHFDGHQWDJHEUXVK WDQGVZ LWK OP LWG KHUEDFHRXVXQGHUWRU\ GXHVR ODFN RI LILH 7KH WW,WWEOH DQG ILJXUHQHG VR EHFRP SDUHG DJDLQWWKHDWRFDWG UHHUHQFHWDW(6' DQG 67 0 VR WXO GHWLP IQHWKHUDO' DOWLDWRQVLQ YHJHWDWRQ FRP P XQLWHV´

5HSRQVH 7KDQN\RXIRU\RXUFRP P HQW 7KH($ LVP HUHO WWWQJ WKDWOYHVRFN JUD]LQJ KDV EHHQ DFDXVDOLDFWRULQ DOWLQJ WKHYHJHWWYHFRP P XQLWHVHYHQ DVILUHUHJLP HV DQG RWKHU DQWKURSRJHQLF DFWYLWHV KDYHLQXHQFHG YHJHWWRQ

7DEOH RI WKH($ OWWWKH1 5&6 VRLODWRFDWRQVDQG(6' VDWRFDWG ZLWK WKHVRLOP DS XQLW IRXQGLQ+&&8(3 7KH1 5&6 ZDVFRQWFWG UHJDUGLQJ DYLODEOLDW RI WKHOXWG(6' V 3DW 1 RYDN ZLWK1 5&6 5HQR 1 9 WWWG LQ DQHP DLOGDWG 1 RYHP EHU WKDW(6' V 5 ; < 1 9 DQG5 ; < 1 9 ZHUHWKHRQ\(6' VDYLODEOH 7KHRWKHUVWWOXWG LQ 7DEOH RI WKH($ DUHQRWSSURYHG DQG WKHUHRUHFDQQRWEHXVHG LQ WKH($ 67 0 VDUHDOR FXUUHQW XQGHUGHYHORSP HQWRUDO(6' VLQ WKH+&&8(3 DUHD 7KLVHP DLOFRUUHVSRQGHQFHLV GRFXP HQWG LQ WKHSURMHFWUHFRG**

&RP P HQW 3DJH 3 - &RYHU ,WLVLQWWUHWWQJ WKDWWKH($ QRWWV,VWWQFHRI RQHVHHGHG MXQLSHU *Juniperus monosperma* LQ WKHDUHD : HZ HUHQRWDZ DUHRI WKH H,SWWQFHRI WKLV VSHFLHVLQ WKHDUHD 7KLV VSHFLHVLVQRWUHFRJQL]HG DVRFFXUUQJ LQ1 HYDGD E\ 1 5&6 ,VWKLV VSHFLHVWWXO SUHWHQW

5HSRQVH 7KDQN\RXIRU\RXUFRP P HQW*J. monosperma* GRHVQRWRFFXULQ WKH3URMHFWDUHD 7KH ($ KDVEHHQ UHYLVHG WX UHOHFWWKLVFRUUHFWRQ

&RP P HQW 3DJH 3 - (30 : HDUJXHDJDLQWWXVLQJ WKH,6$) UHHUHQFHLQ GHWWLP IQLQJ ZKHUH3 - UHP RYDQ(30 ZRXOG EHUHWWLFWWG WX : HVXJJHWWXVLQJ (6' VDQG WKHUHHUHQFHGHYHORSHG VSHFLLFDOO IRU3 -

- **7DXVFK 5 - 0 IOOHU 5) 5 RXQG\ %$ DQG &KDP EHUV - & 3 Ix RQ DQG - XQLSHUILHOG JXLGH $ VNLQJ WKHUJKWXHWWRQVWX VHOHFWDSSURSUDWW P DQDJHP HQWDFWRQV 8 6 * HRORJLFDO6XUYH &ILFXOOU S**

5 HVSRQVH (6' V5 ; < 1 9 DQG 5 ; < 1 9 Z HUHVWHRQ) (6' VSXEOLFDO DYDLODEOH DWWKHWP HRI WKH($ 67 0 VDUHDOR FXUUHQW XQGHUGHYHORSP HQWRUDO(6' VLQWKH+ & &8 (3 DUHD EXWQRW HWDYDLODEOH IRUSXEOLF XVH $ UHDVFKDUFWUL]HG DV3KDH, DQG3KDH,, SLQ\RQ MXQLSHUHQFURFKP HQWZ RXOG EHFRQVLGHUHG IRUWHDW HQW 7KHUHHUHQFHP HQWRQHG LQ\RXU FRP P HQWZ DVXVHG E\ (6&2 LQWKHYHJ HWDWRQP DSSLQJ H[HUFLVHWKDWGHQWLHG HQFURFKP HQW DUHDVLQWKH+ & &8 (3 DUHD

&RP P HQW 3 DJH (6' V 7 H[WWWWWV WKDW (6' VDUHFXUUHQW) EHQJ UHYLVHG IRUWKH+ & &8 (3 DUHD EXWDUHQRW HWLQDORUDSSURYHG E\ WKH1 5 &6 ´ : HGR QRWEHDHYH WKLV WWWWP HQWWR EH HWXH 7 KH(6' VIRUWKHDUHD KDYHEHHQ SXEOLVKHG DQG DUHDYDLODEOHWR WKHSXEOLF QRZ >1 5 &6 LV@Z RUNLQJ Z LWK 8 1 5 WR GHYHORS WKH6 WWWWDQG 7 UDQVLWRQ 0 RGHO 67 0 V DWWRFLDWHG Z LWK WKH(6' V QRWLHYLVLQJ WKH(6' VWKHP VHOYHV

1 (3$ UHIXLHVFRRUGLQDWRQ Z LWK RWKHUDJHQFLHV WKDWKDYHVSHFLDOH[SHUWXH 1 5 &6 P XW EHFRQVXOWG WR EUIQJ IQMJKWQR WKHYHJHWWRQ G\ QDP IFVIQ WKHDUHD - XWEHFDXVHWKH 67 0 VDUHQRW HW SXEOF´ GRHVQRWXQGHUP IQHWKHVSHFLDOH[SHUWXHWKDW1 5 &6 KDVIQ DSSOIQJ WKHVFHQFHWR WKHDUHD

5 HVSRQVH 7 DEOH RI WKH($ OWWWKH1 5 &6 VRLODWRFLDWRQVDQG(6' VDWRFLDWG Z LWK WKH VRLOP DS XQLWVIRXQG IQ+ & &8 (3 7 KH1 5 &6 Z DVFRQWFWG UHJ DUGIQJ DYDLODEIOW RI WKHOWWG (6' V 3 DWW1 RYDN Z LWK1 5 &6 5 HQR 1 9 WWWG IQ DQ HP DLOGDWG 1 RYHP EHU WKDW (6' V5 ; < 1 9 DQG 5 ; < 1 9 Z HUHVWHRQ) (6' VDYDLODEOH 7 KHRWKHUVWWVOWWG IQ 7 DEOH RI WKH($ DUHQRWDSSURYHG DQG WKHUHRUHFDQQRWEHXVHG IQ WKH($ 67 0 VDUHDOR FXUUHQW XQGHUGHYHORSP HQWRUDO(6' VIQ WKH+ & &8 (3 DUHD 7 KLVHP DLOFRUUHVSRQGHQFHLV GRFXP HQWG IQ WKHSURMHFWUHFRUG

&RP P HQW 3 DJH >@ 6RLO) IHG, QYHQWRU\ : HDUHXQFRP IRUWEOHZ LWK WKH JUHDWGLVFUHSDQF\ EHWZHHQ WKH1 5 &6 VRLOP DS XQLWDQG WKHFRQXOWQWIHG IQYHQWRU\ GLVFUHSDQF\ : DVD TXDOLIHG 1 5 &6 VRLOVFIHQWWWFRQXOWG DQG IQYRYHG IQ WKHIIHG IQYHQWRU\" 7 KHWW[WH[SOWIQVDZ D\ WKHGLVFUHSDQF\ GXHWR 1 5 &6 XVHRI ³ UHP RWW) VHQVHG GDWD DQG OWQGVFDSH VFDOHIQWWLS UHWWWRQV´ + RZ HYHU Z HNQRZ WKDWWKHUHZ HUHP DQ\ VRLO SIWGXJ DQG IIHG WXXWIQJ WKDWOFFRP SDQIHG WKH1 5 &6 VRLOP DS SIQJ Z KHQ IWWWRN SOWFH 1 5 &6 P XWWEHFRQXOWG WR EHDEOHWR EHWWU GHVFUEHWKHGIIHUHQFHV DQG YDOGDWWWKH FRQXOWQWV UHXOV

7 KHVRLOIIHG IQYHQWRU\ Z DVFRQGXFWG E\ D&HUWIHG 3URIHVVRQDO6RLO6FIHQWWW6RLO&OWWIIHU 0 U 3HWU6P IWK DQG-DP HV0 RUHH $ VH[SOWIQHG IQ 7 DEOH DQG VHFWRQ RI WKH ($ WKHGLVFUHSDQFIHVIRXQG EHZ HHQ WKHIIHG GDWDDQG WKH1 5 &6 P DSSHG GDWDZ HUHSUP DUIQ DWWIEXWG WR P IQRUVRIOFRP SRQHQWGIIHUHQFHV 7 KH1 5 &6 VRLOVIQIRUP DWRQ IURP Z HE VRLO VXUYH\ GIG QRWWKRZ DQ\ 1 5 &6 RU%/ 0 VRLOSURIIOHGHVFUSWRQVIQ WKHSURMHFWDUHD WKDWZ RXOG KDYHEHHQ FRP SOHWWG Z KLOHIIHG P DSSIQJ Z DVEHQJ FRQGXFWG P DQ\ \HDUVDJR

1 DWRQDO&RRSHUDWLYH6RLO6XUYH\ P DSSLQJ FRQGXFWHG LQ WKH VDQG VLQ1 9 IRUPHG WKHP HWKRGVGHVFULEHG LQ WKH1 DWRQDO6RLOV+ DQGERRN Z KLFK LQYROYHVFRP SOHWLQJ VRLOERULQJ V RUH[DP LQDWRQVRI EDQN FXWZ KLOHWDYHUVLQJ OQGVFDSHVZ LWKLQ WKHVRLOVXUYH\ DUHD 7 KH 1 5&6 %/ 0 FRQVXOWLQJ VRLOVFLHQWWVP D\ KDYHFRP SOHWHG P DQ\ VRLOERULQJ VDQG RUH[DP LQHG EDQN FXWZ KLOHFRQGXFWLQJ WKHVRLOVXUYH\ Z RUN EXWZ KHWKHULWZ DVFRP SOHWHG LQ WKH+ & &8 (3 DUHDLVQRWFRQILUP HG

&RP P HQW 3 DJH * UDJLQJ $ 8 0 VDQG 3 DJH >@
6REFIRHFRQRP IFV : HIIQG LVGLVLQJ HQXRXVWR VSHDN RI IP SDFWRI OWV$ 8 0 VIQ D SHUFHQWDJH RI WKWOSHLP LWWG $ 8 0 V 2 XU&RXQW SODQVDQG SRDFLHVUHIXLHP LWJ DWRQ RI OWV$ 8 0 V UHJDUGDVVRI KRZ P DQ\ 3 HDVHIUDP HP LWJ DWRQ SUREDEO\ IQ WKHVRFFIRHFRQRP IF VHFWRQ WR FRXQWLDFWWKHOWV RI $ 8 0 V UHJDUGDVVRI WKHQXP EHU $ IHZ $ 8 0 VOWVWWP SRUDUL\ RU IRUHYHU UHWXOVIQ P DNRU HFRQRP IF OWVHVRYHUWP HIQ DGGLWRQ WR UHGXFWRQ RI OWQJ WLP VRFIRHFRQRP IF VWWEIOW DQG FXWWP DQG FXOXUHWHG WR UDQFKIQJ

7 KHUHVKRXOG EHFURWFXWQJ DQD\VHVZ KHUHWKHUHGXFWRQ IQ $ 8 0 V HYHQ IL WP SRUDU\ IV TXDQWLIHG DQG GLVFORVHG IQ WKHVRFFIRHFRQRP IFVVHFWRQ WR) RUH[DP SOH FRQVLGHU VRP HWKIQJ VLP ILDU WR WKHIRORZ IQJ DQD\VLV 2 I DOWKHDJUIFXOXUDOFRP P RGLW VDOHVIQ (XUHND &RXQW FDWWOHFDYHVDQG VKHHS OPP EVKLWRUIDO\ DYHUDJH RI WKHVDOHVZ LWK P RWWRI WKHUHP DIQGHUP DGHXS RI H[SRUWKD\ $ FFRUGIQJ WR WKH &HQVXVRI $ JUIFXOXUH WKHUHZ DVD OYHWRFN IQYHQWRU\ IQ (XUHND &RXQW RI QHDU\ KHDGDQG Z RUWK RI DJUIFXOXUHFRP P RGLW VDOHV 6IQFHOYHWRFN DFFRXQWIRU SHUFHQW RI DJUIFXOXUHFRP P RGLW VDOHV OYHWRFN SURGXFWRQ IVUHSRQMEOHIRU JHQHUDWQJ Z RUWK RI SURGXFWVDOHVIQ (XUHND &RXQW IQ 7 KHGLUHFWDQG IQGXFHG EHQHIWRI WKHOYHWRFN IQGXWW\ IQ (XUHND &RXQW FDQ EHGHWHUP IQHG EDVHG XSRQ IQIRUP DWRQ FRQWLQHG IQ WKH8 QLYHUVLW RI 1 HYDGD 5 HSRUW 5 HQR 7 HFKQLFDO5 HSRUW8 &(' 8 SGDWHG (FRQRP IF / IQNDJHVIQ WKH(FRQRP \ RI (XUHND &RXQW 7 KHOYHWRFN VHFWRUIQ (XUHND &RXQW KDVD IIQDOGHP DQG P XOWSOHUR RI , Q VKRUWWKLVP HDQVWKDW IRUHYHU\ JHQHUDWHG E\ WKHVHFWRU(XUHND &RXQW¶VFFRQRP \ Z LOOEHQHIIW RI WRWO UHYHQXH 7 KHKLJK IIQDOGHP DQG P XOWSOHUVXJJHVW WWRQJ HFRQRP IF OQNDJHVRI WKH OYHWRFN VHFWRU WR RWKHU VHFWRUV RI WKHFRXQW¶VFFRQRP \ , QFRP HDQG HP SOR\ P HQW P XOWSOHUVDUHDOR RI IP SRUWQFH 7 KHOYHWRFN VHFWRUKDVDQ IQFRP HP XOWSOHUR RI DQG DQ HP SOR\ P HQWP XOWSOHUR RI 7 KXV IRUHYHU\ JHQHUDWHG E\ OYHWRFN SURGXFWRQ WRWOFRXQW KRXVHKROG IQFRP HIQFUHDVHVE\ DQG IRUHYHU\ NRE DGGHG E\ WKHOYHWRFN VHFWRU WRWOHP SOR\ P HQWQ (XUHND &RXQW IQFUHDVHVE\ HP SOR\ HHV

, Q IXQGVZ HUHDS SURSUIDWHG WKURXJK WKH1 HYDGD / HJ ILVODWXUH WR FUHDWH D1 HYDGD 3 XEOIF / DQG * UDJIQJ ' DWHEDVHDQG (FRQRP IF $ QDO\VLV , Q WKH1 HYDGD 6 WDWH ' HSDUW HQWRI $ JUIFXOXUHDVNHG WKH1 HYDGD $ VWRFHDWRQ RI &RXQWHV WR DWWLWWQ IXOIOOQJ WKLVP DQGDWH 5 HWRXUFH&RQFHSW , QF Z DVFRQWDFWHG WR KHS FRP SOHWH WKHGDWHEDVHDQG DQD\VLV 7 KHSURGXFWRI WKLVHIRUWLV WKHUHSRUW1 HYDGD * UDJIQJ 6 WDWWWFV5 HSRUWDQG (FRQRP IF $ QDO\VLVIRU) HGHUDO/ DQGVIQ1 HYDGD 5 HWRXUFH&RQFHSW , QF 0 DUFK

**7 DEOH RI WKH5 HSRUWS VXP P DUL]HV WKHHFRQRP IF IP SDFWRI $ 8 0 RI JUD]LQJ LQ 1 HYDGD DVIRORZ V %DVHFDOO IRUHYHU \ $ 8 0 ORWWRUJDLQHG WKHRYHUDOOIP SDFWWR WKH OYHWWRFN SURGXFHUKIP VHD LQ RQH\ HDUHTXDOV 7 KHWRWDOHFRQRP IF IP SDFW Z KIFK LQFOXGHVWKHLQGXVW\ IP SDFWDQG YDOXHDGGHG IP SDFW WRWDOG WR SHU$ 8 0 GLUHFWDQG LQ LQGLUHFWDQG LQGXFHG IP SDFW 7 KHILJXUHVDERYHGR QRWWNHLQWR DFFRXQWLQLOWRQDU\ FKDQJHVVLQFH %DVHG RQ GDWD UHSRUWG IURP WKH%XUHDX RI / DERU 6WDWWWFVIRUHDFK\ HDUVLQFH WKURXJK WKHDYHUDJHUDWWRYHUWKHSDWW \ HDUVIV DSSUR[IP DWO SHU\ HDU 7 KHUHIRUHDSSOLQJ D UDWWRI HDFK\ HDUVLQFH JIYHVD YDOXHRI RQH$ 8 0 WR WKHSURGXFHUDURXQG DQG WKHHQWLHORFDOFHFRQRP \ DURXQG

5 HVSRQVH 7 KDQN\ RX IRU\ RXUFRP P HQW 1 R DGP LQLWWDWYHUHGXFWRQ LQ$ 8 0 VZ RXOG RFFXUDV DUHXOWRI + & &8 (3 DFWYLWHV 3DJ H VHFWRQ RI WKH($ GHVFUEHVWKDWWKHH[LWWQJ DFUHVRI VXUDFHGLWXUEDQFHKDVUHGXFHG VXUDFHJ UD]LQJ FDSDFLW WKDWZ RXOG VXSSRUW $ 8 0 V 7 KH3 URSRVHG $ FWRQ IRUDQ DGGLWRQDO DFUHVRI VXUDFHGLWXUEDQFHZ RXOG UHGXFH VXUDFHJ UD]LQJ FDSDFLW Z KIFK Z RXOG VXSSRUW $ 8 0 V 7 KHMHOYHOVRI UHGXFWRQ Z RXOG QRW UHTXLUHLWXDQFHRI Z DLYHVRUUHTXLUHFKDQJ HVWR FXUUHQW UD]LQJ P DQDJ HP HQWSUDFWFHVRU OYHWWRFN IP SURYHP HQW &KDQJ HVWR UDQJ HDDQG UHRXUFHVDVD UHXOWRI WKH3 URSRVHG $ FWRQ Z RXOG OWWRU \ HDUV

7 KH%/ 0 LVQRWXEMFWWR FRXQW P DQGDWV 7 KHLVXHVRXWOQHG LQ WKHFRP P HQWZ RXOG QHG WR EH VHWWOHG EHWZ HHQ WKHP IQHDQG WKHFRXQW IQGHSHQGHQW 7 KH%/ 0 LVQRW[SHFWQJ $ 8 0 UHGXFWRQ EXWI WKH GLG RFFXUWKH%/ 0 Z RXOG LVXHD Z DLYHUWR WKHSHUP LWWH

1 HYDGD ' HSDUWW HQWRI : IOOLIH

&RP P HQW 3 J %DUUIFN Z IOORQ) EXIIHU VHHS VDQG VSUQJ VIL WKH DUHDFWWHD IORZ IQJ : K\ QRWEXIIHUDOONQRZ Q VHHS VDQG VSUQJ VE\ IHHWLHJ DUGOHVRI IORZ " $ V1 HYDGD LVIQ WKHWKLG FRQWHFXWWH\ HDUR GURXJKWQRWDOONHS VDQG VSUQJ VZ IOOH[SUHV WKHP VHOYHVRQ WKHVXUDFHSUHHQW)) XUWKHUP RUH Z KDWWHDVRQ Z RXOG WKHVHS VDQG VSUQJ VEHFKHFNHG IRU IORZ " : KR Z RXOG GHWLP IQHIORZ "

5 HVSRQVH 7 KHFRP P HQWUHHLVWX SDUDJ UDSK RI WKH($ SDJ H Z KIFK WWXWV

> *Barrick would not conduct new surface disturbing activities within at least 100 feet of any drainage, seep, or spring that is actively flowing. From June 1 through August 15, Barrick would not conduct new surface disturbing activities within 0.5 mile of any drainage, seep, or spring that is actively flowing to minimize impact to wildlife.*

7 KHRUJ LQDOLQWQWRI WKHUH HUHG WX WXWWP HQWLQ WKH($ Z DVIRUZ IOOOLHP DQDJ HP HQW 7 KH WXWWP HQWKDVEHHQ UHSOFHG Z LWX WKHIRORZ IQJ WX[WWX FOUI\ WKHIQWQWRI WKLVP HDXUHWX DOVR SURWFWZ DWUTXDOW DQG UISDUDQ DUHDV 6HFWRQ RI WKH) IQDO($

Water and Riparian Resources

%DUUFN Z RXOG QRW¬RQJXFWQHZ VXUDFHGLVXUEOQJ DFWLYLWHVZ LWKLQ USDUDQ RUZ HQDQG DUHDV
Z LWKRXWDXWKRU]DWRQ IURP %/ 0 DVRXWQHG DERYH

,I %DUUFN GHWHUP LQHVWKDWQHZ VXUDFHGLVXUEDQFHDFWLYLWHVZ LWKLQ USDUDQ DUHDVDUHUHTXLUHG
%DUUFN Z RXOG VXEP LWWRVWH %/ 0 WKHORFDWRQVRI WKHSURSRVHG GULOOSDGVDQG DFFHVVURDGVLQ DQ
DFFHSWDEOHIRUP DWLH HDFWRQIF VSDWDOLOHV %DUUFN Z RXOG QRW¬RQJXFWWKHSURSRVHG
RSHUDWRQVXQDHVDXWKRU]HG E\ %/ 0 Z KIFK P D\ UHTXLUHIXUWHUHQYLUQP HQWDODO VLV
RSHUDWQJ UHWUFWRQV RUVLWVVSHFLIF UHRXUFHSURWFWRQ P HDVXUHV ,I LWLVWHRQ SUDFWFDEOH
DOWLQDWYH WKH%/ 0 P D\ DXWKRU]HVXUDFHGLVXUEDQFHZ LWKLQ USDUDQ DUHDVI LWLVGHWUP LQHG
WKDWWKHDFWRQ DVSURSRVHG RUFRQGLWRQHG Z RXOG QRWP SDLUWKHORQJ WUP IXQFWRQ RUXWDW RI
USDUDQ KDELWDW

,I %DUUFN GHWUP LQHVWKDWQHZ VXUDFHGLVXUEDQFHLVUHTXLUHG Z LWKLQ Z HQDQG DUHDV %DUUFN
Z RXOG QRW¬RQJXFWWKHSURSRVHG RSHUDWRQVXQDHVDXWKRU]HG E\ %/ 0 $ Q\ GLVXUEDQFH
DXWKRU]HG Z LWKLQ Z HQDQG DUHDVZ RXOG EHLQ DFFRUGDQFHZ LWK (2 6SHFLIIFDO

6HF D ,QIXUWHUDQFHRI 6HFWRQ E RI WKH1 DWRQDO(QYLURQP HQWDO3 ROLF\ $ FWRI
8 6 & E WKIP SURYHDQG FRRUGLQDW) HGHUDOSODQV IXQFWRQV SURJUP VDQG
UHVRXUFHVWR WKHHQG WKDWWKH1 DWRQ P D\ DWWLQ WKHZ IGHWWUDQJHRI EHQHIIFLDOXVHVRI WKH
HQYLURQP HQWZ LWKRXWGHJUDGDWRQ ULVN WR KHDOWK RUVDHW HDFK DJHQF\ WR WKHH[WWQVSHUP LWWG E\
ODZ VKDOODYRIG XQGHUWNQJ RUSURYLGLQJ DWLWWQFHIRUQHZ FRQWXXFWRQ QRFDWG IQ Z HQDQGV
XQDHVWKHKHDG RI WKHDJHQF\ IIQGV WKDWWKHUHLVSUDFWFDEOHDOWLQDWYHWR VXFK FRQWXXFWRQ
DQG WKDWWKHSURSRVHG DFWRQ IQFOXGHVDOOSUDFWFDEOHP HDVXUHVWR P IQIP I]HKDUP WR Z HQDQGV
Z KIFK P D\ UHVXOWURP VXFK XVH

6HF ,QFDUV IQJ RXWWKHDFWWLWHVGHVFUEHG IQ6HFWRQ RI WKLV2 UGHU HDFK DJHQF\ VKDOO
FRQVGHUDFWRUVUHOHYDQWWR DSURSRVDOVHIIHFWRQ WKHVXUYLYDODQG TXDOW RI WKHZ HQDQGV
$ P RQJ WKHHHIFWRUVUH D SXEOF KHDOWK VDHW DQG Z HODUH IQFOXGLQJ Z DWUVXSSO\ TXDOW
UHFKDJ HDQG GLVFKDJ H SRO0XWRQ IORRG DQG WRUP KDJDGV DQG VHGIP HQWDQG HURVRQ E
P DIQWQDQFHRI QDXUDOV\ VWP V IQFOXGLQJ FRQVHUYDWRQ DQG ORQJ WUP SURGXFWWLW RI H[LWWQJ
IORUDDQG IDXQD VSHFIHVDQG KDEWWWGLYHUVLW DQG WWEIQW K\ GURORJ IF XWDW IIVK Z IO0GDH
WP EHU DQG IRRG DQG IIEHUUHRXUFHV DQG F RWHUXVHVRI Z HQDQGVIQ WKHSXEOF IQWUHW
IQFOXGLQJ UHFUHDWRQDO VFIHQWIF DQG FXOXUDOXVHV

([LWWQJ H[SORUDWRQ DQG UHFOP DWRQ DFWLWHVZ LWKLQ USDUDQ EXIIHUDUHDVZ RXOG EHDOORZ HG WR
FRQWQXHSURYLGHG WKH%/ 0 FRQGXFWRQ J RIQJ HYDOXDWRQVRI RSHUDWRQVWR P DNHDQ\ USDUDQ
P IWJ DWRQ UHFRP P HQGDWRQV

$ OOH[SORUDWRQ DFWLWHVZ RXOG FRQWQXHWR EHFRQGXFWG XVLQJ %0 3 VVXFK WKDWWHGIP HQW
FXWQJ V GUOOQJ IOXIGV RUDQ\ RWHUP DWUDORUVXEWWQFHZ IOOQRWHQWUIORZ IQJ GUDQDJ HV

6HHSVDQG VSULQJ VZ ILOOFRQWQXHWR EHFKHFNHG IRUEDVHIORZ IQ WKH6HSWHP EHU2 FWREHU WP HUDP H $ FRQVXOWQWR %DUUFN ZILOOFRQGXFWWKHVXUYH DQG %DUUFN ZILOOVXEP LWWKHVHSVDQG VSULQJ VVXUYH UHSRUWWR %/ 0 RQ DQ DQQXDOEDVLV

&RP P HQW 3 J 6HFWRQ 6XUDFHGLWXUEDQFHVXUYH VVKRXOG EHEHHWU GHIQHG ZLWK D VHDVRQDOOUDQJHIRU WKHFOHDUDQFHVXUYH V 7KHP DNRUW RI 1 (3 $ GRFXP HQWVUHTXLH VXUDFHGLWXUEDQFHVXUYH VGXULQJ 0 DUFK - XO

5HVSRQVH 3UHGLWXUEDQFHFOHDUDQFHVXUYH VIRUP LJ UDWU EILGVZ ILOOEHFRQGXFWG IRORZ IQJ %/ 0 : ILOOLH3URWRFRO %/ 0 Z KIFK WDWWWKDWFOHDUDQFHVXUYH VVKRXOG EHFRQGXFWG Z KHQ DSURSRVHG DFWLYLW Z RXOG LQYROYHJURXQG GLWXUEDQFHGXULQJ WKHQHWWQJ VHDVRQ 7KH SURWRFROVSURYLGHWKDWWKHVXUYH VP XWWEHFRQGXFWG DP DI IP XP RI WZ R Z HHNV SUIRUWX GLWXUEDQFHDQG DUHWKHQ DGHIXDWI IRUDP DI IP XP RI WZ R Z HHNV 7KHQHWWQJ VHDVRQ LVGHIQHG IQ WKH($ VHFWRQ DV0 DUFK WX-XO FRQVLWWQWZ LWK %/ 0

,QDGGLWRQ WX SUHGLWXUEDQFHFOHDUDQFHVXUYH V %DUUFN DOVR FRP P LWVWX FRQGXFWQJ DQQXDO P LJ UDWU EILG VXUYH V DVVWWWG IQ WKH($ VHFWRQ .

7KXV WKH(30 VIQ VHFWRQ UHOHFWWZ R WSHVRI VXUYH V Z KIFK DUHQRWQHFHVDUIO FRQGXFWG DWWKHVDP HWP H %/ 0 KDVUHYLVHG WKHWW[WRI WKLV VHFWRQ WX WKHIRORZ IQJ WX P RUH FOHDUO UHOHFWWKHGIIHUHQWWSHVRI VXUYH VWKDWZ ILOOEHFRQGXFWG IRUDYDQ VSHFIHV

Barrick would have a BLM-approved biologist survey in early spring of each year all areas proposed for drilling or surface disturbance for the presence of active nests. Barrick has committed to conducting pre-disturbance migratory bird nest surveys in the spring and establishing exclusion zones around active nests as part of the applicant-committed EPMs. Additionally, surface disturbance clearance surveys will be conducted following BLM Wildlife Protocols (BLM 2014) when a proposed activity would involve ground disturbance during the nesting season, defined by BLM as March 1 through July 31. When active nests are located, or if other evidence of nesting is observed (e.g., mating pairs, territorial defense, carrying nesting material, transporting food), Barrick's biologist will recommend to the BLM an avoidance buffer around the nest which the BLM, in coordination with the Nevada Department of Wildlife (NDOW) and the U.S. Fish and Wildlife Service (USFS), will review and approve prior to surface disturbance. Barrick's biologist will inform Barrick when the birds have left the nest. Barrick would not conduct any drilling or surface disturbing activities within the exclusion zone until the biologist determines that the birds are no longer nesting.

&RP P HQW 3 J G%$ DERYHZ KDW : KDWLV WKHWXUHWKRQG WKDWKDVEHHQ VHWRU DP EIHQW : KDWWSHFILIF P HWL[>VIF@Z ILOOWKH G%$ FRP SDUHG WX WKHUHRUHSRWQWDOOQRIVH H[FHHGDQFHVFDQ EHDGGUHWHG" , Q WKHDEVHQFHRI EDVHDIQHGDWD RQ QRIVH 1 ' 2 : UHFRP P HQGVXVIQJ FXUUHQWDWDWUDXUHVXJJHWWQJ EDVHDIQHDP EIHQW/ IQ WKH* UHDW%DVQ IV G%$ $ P EURVHDQG) ORUDQ 3 DWLFHOOHWDO

5 HVSRQVH %DUUIFN¶VFRQVXOWDQWKDYHSUHSDUHG DWWFKQIFDOP HP RUDQGXP UHYLHZ HG E\ %/ 0 WKDVSURSRVHVEDVHDLQHQRLVHWKUHVKRGVIRUWKHSXLSRVHVRI HYDOXDWQJ QRLVHIP SLFWVWX QHDE\ OHNVGXUQJ EUHGLQJ VHDVRQ IURP WKHSURSRVHG 3URMHFW$ WWFKP HQW %DVHDLQHGDWDKDVEHHQ FROOHFWHG IRUWKH+ & &8 (3 DQG Z DVUHSRUWHG LQ $ 5 &$ ' ,6 (P SLUIFDOEDVHDLQHGDWD FROOHFWHG IRORZ LQJ 1 ' 2 : DQG %/ 0 J XLGDQFH Z DVFROOHFWHG IURP WKH3URMHFWDUHDDWWZ R DFWXYHOHNV 7 KHSURSRVHG EDVHDLQHQRLVHWKUHVKRGVFDQ EH XVHG WX FRP SDUHWX WKH G%$ WKUHVKRGLQFUHDVHOP LWGHQWLHG LQ %/ 0

7 KHWWFKQIFDOP HP RUDQGXP $ WWFKP HQW GDWG -DQXDU\ $ 5 &$ ' ,6 IQFOXGHV FDOFXODWRQVRI DP EIHQWQRLVHWKUHVKRGVEDVHG RQ/ UDWHUWKDQ/ YDOXHV / LVWHP RUH DSSURSUDWSURWFROWX XVHIRUWKLVSXLSRVH

7 KH($ KDVEHHQ UHYLVHG Z LWK WKHIRORZ LQJ UHXXOW

1 RLVH P RQLWRULQJ UHXXOW UHSRUWG EHORZ IQFOXGH GDWD FROOHFWG IURP DP WX DP DOO P RQLWRULQJ GD\ VIURP 0 DUFK WKURXJK 0 D\ FRP EIQHG

7 KH QRLVH P RQLWRULQJ GDWD DWWKH+ RUVH &UHHN / HN $ 5 &$ ' ,6 D $ 5 &$ ' ,6 VLWH VKRZ VWKHIRORZ LQJ

- 0 IQ/ G%$
- 0 DJ / G%$
- / IQHDU0 HDQ/ G%$

7 KHEDVHDLQHQRLVHWKUHVKRGG DW+ RUVH&UHHN / HN Z DVFDOFXODWG DV $ 5 &$ ' ,6

7 KH QRLVH P RQLWRULQJ GDWD DWWKH1 HZ %URFN &DQ\ RQ/ HN $ 5 &$ ' ,6 D $ 5 &$ ' ,6 VLWH VKRZ VWKHIRORZ LQJ

- 0 IQ/ G%$
- 0 DJ / G%$
- / IQHDU0 HDQ/ G%$

7 KHEDVHDLQHQRLVHWKUHVKRGG DW1 HZ %URFN &DQ\ RQ/ HN Z DVFDOFXODWG DV $ 5 &$ ' ,6

7 KH G%$ DP EIHQWWKUHVKRGG UHSRUWG E\ $ P EURVHDQG) ORUDQ GRHVQRWUHOHFW DP EIHQWQRLVHIQ WKH* UHDW%DVQ 5 DWHU WKLVWKUHVKRGG Z DVGHULYHG IURP P HDXUHP HQW FROOHFWG IQ DZ IOHHQHQHWVDUHDRI : \ RP IQJ GXUQJ DQDUURZ WP HUDP H QJ KWDQG FDOP P RUQIQJ VRQ\ GXUQJ VSUIQJ WP H $ VDOR UHFRP P HQGHG E\ $ P EURVHDQG) ORUDQ XVLQJ VLWH VSHFLIF EDVHDLQHGDWD Z IOOEHD P RUHDFFXUDWDQG DUHOEOHP HDQVZ IWK Z KIFK WX HYDOXDWH SRWHQWDOQRLVHIP SLFWWX DFWYHOHNV UDWHUWKDQ DWXP IQJ DWKUHVKRGG WKDWZ DVEDVHG RQ GDWD FROOHFWG HOWHZ KHUHWX IXDLOGLIHUHQWSURWFWREWFWYHV ,WWKRXOG EH QRWG WKDWWRSRJ UDSKIF IHDXUHVEHWZ HHQ WKH1 HZ %URFN &DQ\ RQ/ HN DQG + RUVH&DQ\ RQ KDYHEHHQ IGHQWIHG WKDWZ RXOG SUHFOXGHIWURP H[SHUHQFIQJ QRLVHHIIHFWIURP + & &8 (3 H[SORUDWRQ DFWYLWHV

**&RP P HQW 3 J 6HFWRQ , WLV WDWHG WKDW WKH LQFUHP HQWDO LPSDFW RI KDELWDW Z RXOG QRW GHFUHDVH WKH TXDOLW RI VXUURXQGLQJ KDELWDW+ RZ KDV WKLV GRFXP HQWDGGUHVVHG WKHIP SDFWRI KDELWDWWUDJP HQWDWRQ E\ WKLVH SORUDWRQ YHQXUHZ LWKLQ WKH+ & &8 (3 ERXQGDU\ " 7 KHGRFXP HQWWDWW/WKDWWKH+ & &8 (3 H SORUDWRQ Z RXOGQ WGHFUHDVHWKH YDOXHRI VXUURXQGLQJ KDELWDWLQ WKH&RUW0 RXQWDLQV DQG VXUURXQGLQJ YDOOH VEXWZ LWK DGGLWRQDOH SORUDWRQ DQG DQ H LVWLQJ P ILQHZ LWKLQ WKH&RUW0 RXQWDLQV WKHORW RI VXLWDEOHKDELWDWLV WKDWP XFK P RUHIP SRUWDQWWR DOOZ LOGOLIHUHWRXUFHV

5 HVSRQVH 7 KHUHHUHQFHG VHQWQFHRQ SDJH VHFWRQ WDWV

It is expected that incremental reduction of sagebrush and woodland/chaparral communities in localized areas of HC/CUEP as a result of the Proposed Action would not decrease the quality of surrounding habitat within HC/CUEP, or adjacent areas in the Cortez Mountains and surrounding valleys.

,QFUP HQWDOP SDFWVWR Z LOGOLIHI URP WKH SURSRVHG 3URMHFW Z HUHFRQVLGHUHG LQ WKH DQDO VLVIQ WKH FRQW[WRI H[LVWQJ GLVXUEDQFHVDQG P DSSHG YHJ HWDWRQ WSHV 3RUWRQVRI WKH+ & &8 (3 DUHD DUH FXUUHQW GLVXUEHG ([SORUDWRQ DFWWLWHV KDYH UHVXOWHG LQ WKHFXUUHQWXUDFHGLVXUEDQFHRI DFUHV 7 KHP DRUW RI VXUDFHGLVXUEDQFHKDVRFFXUUHG LQ DUHDVP DSSHG DV%XUQHG 3IQ RQ -XQLSHU 6Z HOOQJ &OD\ VDJHEUXVK DQG EXUQHG VDJHEUXVK FRP P XQLWHV &KDQJHVWR YHJ HWDWRQ FRP SRVLWRQ IQ WKHEXUQHG DUHDVRI + & &8 (3 KDYHQRWDOWUHG XQGLVXUEHG FRP P XQLWHV 2 WKHU GLVXUEDQFHVKDYHEHHQ FDXVHG E\ IILH J UD]IQJ IQYDVRQ RI FKHDWUDW IRUP HUP IQIQJ RSHUDWRQV DQG SXEOF XVHVRI WKHODQG 5 HFOP DWRQKDVIP SURYHG RUZ RXOG IP SURYHWKH FRQGLWRQ RI YHJ HWDWRQ IQ DUHDVWKDWEXUQHG IQ WKH IILHHYHQW

8 QGHUWKH+ & &8 (3 3OD Q $ P HQGP HQW%DUUFN SURSRVHVWR IQFUHDVH WKHWRWDOXWRU] HG GLVXUEDQFHE\ DQ DGGLWRQDO DFUHVWR DFUHV 7 KLVHTXDWVWR DGLVXUEDQFHWRWDOQJ DQ DGGLWRQDO SHUFHQWRI WKHWRWDOODQG VXUFHIQ WKH+ & &8 (3 ERXQGDU\ 7 KHSURSRVHG DFWWLWHVDQG DWRFHDWG GLVXUEDQFHVZ RXOG EHIQFUP HQWDORYHUD \ HDUSHUIRG DQG Z RXOG RFFXUIQ ORFDO] HG DUHDVDURXQG GUOOSDGVDQG URDGV 7 KXV DVGHVFUEHG IQ WKH($ WKHSURSRVHG GLVXUEDQFHVDUHVP DOOIQ WKUP VRI ERWK WRWDODFUHDJ HDQG IQGLYIGXDOVXUFHGLVXUEDQFHVDQG DUH VSDFHG IQ WP H &RQFXUHQWUHOOP DWRQ Z RXOG WXNHSODFHZ KHUHSUDFWFDEOH ' UOOSDGVDQG URDGV Z RXOG EH UHFOPP HG IQ DFFRUGDQFHZ LWK 1 HYDGD5 HYLVHG 6 WDWXWH 1 5 6 $ DQG IIQDO UHOOP DWRQ Z RXOG EHIQLWDWDWG RQFH WKHH[SORUDWRQ SURJ UDP KDVEHHQ FRP SOHWHG VXFK UHOOP DWRQ Z RXOG EH FRQFOXGHG Z LWKIQ WZ R \ HDUVRI FHWDWRQ RI H[SORUDWRQ DFWWLWHV

7 KHEXONRI VFIHQWLF WXGLHVWR GDWHIQGIFDWWKDWQHJ DWYHIP SDFWRI KDELWDWORWDUHJ HQHUDOO P XFK J UHDWUWKDQ WKRVHRI KDELWDWUDJ P HQWDWRQ) DKUJ) DKUJ ,QOOQGVFDSHVWKDW KDYHORZ OHYHOVRI KDELWDWDYDLODEILOW KDELWDWUDJ P HQWDWRQVEHFRP HVP RUH³ IP SRUWDQW VXFK WKDWFXP XODWYHHIHFWRQ Z LOGOLIHSRSXODWRQVIURP KDELWDWORWDQG IUDJ P HQWDWRQ FRP EIQHG FDQ UHFK J UHDWUOHYHOVRI IP SDFW6 WXGLHVWR GDWKDYHIRXQG WKDWP SDFWIURP KDELWDW IUDJ P HQWDWRQ RQ EIRGLYHUWW RUZ LOGOLIH VSHFIHVDEXQGDQFHZ HUHP HDXUDEOHZ KHQ KDELWDW DYDLODEILOW Z DVUHGXFHG E\ WR SHUFHQWRI WKHODQGVFDSH $ QGUHQ : LWK DQG &UUW) DKUJ + LOODQG &DVZ HOO -DQWRQ DQG $ QJ HOWP) DKUJ) OOWKHU

DQG %HYHUV 7KH SURSRVHG DFUHVRI DGGLWLRQDO GLVWXUEDQFHZ RXOG HIXDOW WR DQ DGGLWLRQDO SHUFHQWRI WKH WRWDO DDQG VXUIDFH LQ WKH+&&8(3 ERXQGDU &XUUHQW WKH VDJHEUXVK DQG ZRRGODQG WSHVFRQWXXW SHUFHQWRI WKHP DSSHGODQG FRYHUZ LWLQ WKH +&&8(3 ERXQGDU VHH7DEOH LQ WKH($ 3URSRVHG GLWXEDQFHVP LJ KWUHGXFH WKLVDFUHDJH E\ DP DJ IP XP RI SHUFHQW7KXV DQWFLSDWG KDELWWWRRVVLVZ HOEHRZ WKUHVKROGVZ KHUHLWLV WRRXJ KWKDWKDELWWWUDJ P HQWWRQ ZLOOUHXXOWLQ DP HDXUEOHIP SDFWRQ ZLOOOLHSRSXDWRQV

$ GGLWLRQDO IP SDFWVRI KDELWWWRRVDQG IUDJ P HQWWRQ DUHJ HQHUDO JUHDWUIRUVSHFLHVWKDWUH KDELWWRREOJ DWVUDWKHUWKDQ VSHFLHVWKDWUHKDELWWJ HQHUDOOVW 7KH VSHFLHVUHSRUWG LQ WKH +&&8(3 SURMFWUHD 7HWD7HFK DUHOOU HO KDELWWJ HQHUDOVW 7KHVHDUHUHJ IRQDOO FRP P RQ VSHFLHV Z LWK P REILOW DQG DGDSWEILOW WR YDUHG KDELWWV %DVHG RQ WKHP RGHUDW GHQVLW RI WKHVH VSHFLHVWKURXJ KRXWWKHUHJ IRQ WKHIDFWWKDWSURSRVHG GLWXEDQFHVUHXXOWQJ LQ SRWQWDOKDELWWWRRVWR WR WKH VSHFLHVZ RXOG EHVP DOOUHDWYH WR WKHUWRWOUDQJ H DQG UHDWYH DGDSWEILOW RI WKH VSHFLHVWR DQWKURSRJ HQLF DFWYLWHV WKHSURSRVHG GLWXEDQFHVZ RXOG OLNHO KDYHQHJ OJ IEOHIP SDFWRQ ZLOOOLHUHUHRXUFHVLQ WKHVHDUHDV

%/0 KDVDGGHG WKHIROORZ LQJ SDUDJUDSK WR VHFWRQ WR DFNQRZ OHGJ HWKDWXUURXQGLQJ KDELWWVFRXOG EHDIIHFWWG WKURXJ K KDELWWWUDJ P HQWWRQ FUHDWG E\ SURSRVHG GLWXEDQFHV EXW WKDWWKHHIIHFWRI ILQFUHDVHG KDELWWWUDJ P HQWWRQ RQ ZLOOOLHXVHILVOLNHO WR EHQHJ OJ IEOH

It is expected that incremental reduction of sagebrush and woodland/chaparral communities in localized areas of HC/CUEP as a result of the Proposed Action may affect wildlife use of immediately surrounding habitat within HC/CUEP and may result in habitat fragmentation. The effect of potential habitat fragmentation caused by the Proposed Action is likely to be negligible because of the existing condition of the HC/CUEP area, the nature of the proposed disturbances, which are small in terms of both total acreage and individual surface disturbances, are spaced in time, and would be reclaimed at an on-going basis. This represents a small incremental habitat loss, 0.6 percent of land cover in the HC/CUEP boundary.

**&RP P HQW 3J %LJ JDP H: KDWLV WKHDYDLODEILOW RI VXLWEOHKDEILWWZ LWKLQ WKH &RUWM 0 RXQWLQVIRUP XOHGHHU', VWKHUHDQ DFUHDJHDWRFILWWG ZLWK D WWWWP HQWWKDWLVIDU UHDFKLQJ DQG GRHWQ WDGGUHW WKHHIIRRU\ RI P XOHGHHU' 0 XOHGHHUDUHKDEILWXDOFUHDWXUHV WKDWDUHWWG WR VSHFLIF VHDWRQDOKDEILWW WKHUHRUH, Z RXOG OLNH WR VHH VRP HWKLQJ WKDW VXSSRUW WKLV WWWWP HQWDQG DGGUHWHV WKHVHDWRQDOOHHGVRI WKLVP XOHGHHUKHUG $ P LJUDWRU\ GHHUKHUG GRHVXVHWKLVSURMFWDUHD DQG UHTXLUHVVHDWRQDOKDEILWW WR IDFLOWWWW WKHUP RYHP HQW

5HVSRQVH)URP WKHFRUHVSRQGHQFHVHQWURP 1'2: RQP XOHGHHUXVHRI +&&8(3 DQG VXUURXQGLQJ DUHD 7HWD7HFK $SSHQGL[% DFUHVRI \HDUURXQG KDEILWWUDH DYDLODEOHIRUWKH&RUWM 0 RXQWLQVP XOHGHHUKHUG $SSUR[IP DW) DFUHVRI WKHWRWO DFUHVIDOOZ LWKLQ WKH+&&8(3 ERXQGDU 1RP XOHGHHUZ LQWUUDQJHRUFXFIDOZ LQWU UDQJHZ HUHLGHQWIHG E\ 1'2: WR EHSUHVHQWZ LWKLQ+&&8(3

7KHFXUUHQW%/0 6KRVKRQH(XUHND50 3 %/0 ILQGIFDWV WKDW XOHGHUVXP PHUUDQJHV RFFXUDW HOHYDWRQV RYHU IHHWZ KHUHDV\HDUORQJ DQG ZLQWUUDQJHVRFFXUDWORZHU HOHYDWRQV0XOH'HUURFFXS\DOP RWWDOOWSHVRI KDEWWZ LWKLQ WKHUUDQJH 8SSHUHOHYDWRQ GHHU KDEWWP D\ LQFOXGHP RXQWLQ PDKRJDQ\ EWWUEUXVK EIJ VDJHEUXVK DQG WXQLSHU ZKLOHDUHDV QHDUSHUHQLDOZ DWUVRXUFHV DQG RUQRWKHDWWORSHSRFNHW WSIFDOO KDYHVP DOODVSHQ WXQGV DVWRFDWG ZLWK WKHP 1'2:

0XOHGHUP RYHIURP KIJKHUHOHYDWRQ VXP PHUUDQJHV WR OWZ HUHOHYDWRQ ZLQWUUDQJHV ,QWKH &RUW] +LOOV([SDQVLRQ3URMHFW)LQDO(QYLURQP HQWDO,P SDFW6WDWP HQW%/0 LWLV WXWXWG WKDWDJHQHUDOOQRUWK VRXWK PIJUDWRQURXWLVSUHVHQWEHWZHHQ WKHVRXWHUQ&RUW] 0RXQWLQVDQG *UDW9DOOH\ 0XOHGHUDUHH[SHFWG WR PIJUDWVRXWKDORQJ WKLVURXWGXULQJ WKHIDOODQG ZLQWU DQG UHXLQ WR KIJKHUHOHYDWRQVLQ WKHVXP PHU1RP DWUVHDVRQDOP IJUDWU URXWVKDYHEHHQ IGHQWLHG LQ WKH+&&8(3DUHD

7KHRYHUDOOOP LWQJ IDFWRUIRUP XOHGHUZ LWLQ WKHUHJIRQ LV WKHTXDQWW DQG TXDOW RI DYDLODEOH VXP PHUUDQJH %/0 6HDVRQDOXVHRI P XOHGHUVH[SHFWG WR EHORZ LQ WKHJHQHUDOUHD GXHWR WKHGRZQZ DUG SRSXODWRQ WHQG LQ WKHUHJIRQ DQG WKHOP IWG DP RXQWRI RSHQZ DWU %/0

&RP P HQW 3J %DJ * DP H ,I YHKIFOHZ LOGDLHFRQWRQVDUHD FRQFHUQ RI %DUUIFN¶V WKHQ D FRP SDQ\ FRP P IWWG VSHHG OP IWWKRXOG EHFRQVLGHUHG RUDGGUHWHG

5HVSRQVH %DUUIFN HP SOR\ VDFRP SDQ\ FRP P IWWG VSHHG OP IWWWRQ SURJUDP DQG VSHHG OP IWDUH HQIRUFHG LQ WKH3URMHFWDUHD 7KHIROORZ LQJ (30 Z KIFK DSSHDUV XQGHUVHFWRQ KDVEHHQ UHSHDWG LQ VHFWRQV DQG WR DGGUHVV WKHSRWQWDOIRUYHKIFOHZ LOGDLHFRQWRQV

Speed limits are posted and vehicle speeds reduced in areas of disturbance to minimize the potential for fugitive dust emissions, to protect wildlife and livestock, and to maintain operational safety. Speed limits would continue to be enforced.

&RP P HQW 3J 6HFWRQ &XP XODWLYH HIIHFWDUHVHVHHO) OHFNLQJ IRUDOOZ LOGDLH IP SDFW + DYLQJ D OHJHVFDOHP IQHRQ WKHRSSRVLWWVLGHRI WKHP RXQWLQ UDQJHLVQ WHYHQ DGGUHVHG + RZ GRHV WKLVSURMHFWLQWLDFWZ LWK WKHP IQHDQG RWKHUSDWWDFWWVLWHVOLNHWKH) DOHRQ * RQGRUWDQP IWWRQ OLQH'

5HVSRQVH 7KHDSSURDFK WR DGGUHVVFXP XODWLYH HIIHFWVLVIQWRGXFHG LQ WKH($ VHFWRQ $V WXWXG LQ WKLVVHFWRQ ³*The cumulative effects analysis in this EA tiers off of and expands the analysis in the Cortez Hills FEIS (BLM 2008c)´* 7KHWHUQJ Z DVGRQHVWR HOP IQDWUHGXQGDQF\ IQ WKLVGRFXP HQW1(3$ DQD\VLV

(DFK UHVRXUFHGLVFXVVRQ IQ&KDSWU IGHQWLHVGLUHFWDQG IQGLUHFWHIIHFW Z KIFK DUHWKHQ FDUUIHG IQWR WKHFXP XODWLYHIP SDFWGLVFXVVRQV)RUZ LOGDLHUHVRXUFHV GLUHFWP SDFWZ HUH IGHQWLHG WR EHORFDO]HG DQG VKRUWWUP DQG IHZ II DQ\ IQGLUHFWP SDFWZ HUHIGHQWLHG IRUWKH

J URXSVRI VSHFLHVHYDOXDWG + HQFH FXP XODWYHIP SDFWDERYHDQG EH RQG WKRVHGLVFXVVHG LQ WKH
($ DQG LGHQWLIHG LQ %/ 0 DUHQRWDQWFLSDWG

$ VVKRZ QLQ 7 DEOH VWHDQDO VLVLQFOXGHVFXP XODWYHHIIHFWVRI P LQLQJ DV&RUWM + LQOVDORQJ
Z LWKH[SORUDWRQ DFWYLW LQ + & &8 (3 7 KH) DOFRQ * RQGRUWDQP LWWRQ QLQHUXQVSDUDOHDW
1 9 DERXW P LQHVHDWRI WKH+ & &8 (3 ,WLVQRWGHQWLHG DVDFXP XODWYHDFWRQ GXH
WX LWVGLWWQFHIURP WKH3URMFWDUHD 7 DEOH LQFOXGHVSRZ HUQLQHVWKDWRFFXUIQ&UHFHQW
9 DOOH\

&RP P HQW 3 J) IHG, QYHWWJDWRQ RI * UHDWU 6 DJ H J URXVH+ DEIWW 7 KHH
SDUDJUDSKVGR QRWDFFXUDWH) GHSIFWWKHHMHQW WKDWWRRN SODFH , Q 0 D\ D IIHG WS
WRRN SODFHZ LWK %DUUIN (6&2 % 0 DQG 1 ' 2 : 7 R GDWWWKHLHKDVEHHQ QR IIQDOKDEIWW
UHIQHP HQWRI VDJ H J URXVHKDEIWW 1 ' 2 : GRHVQRWDJ UHZ LWK RUFRQFXUZ LWK WKH(6&2
VDJ H J URXVHKDEIWWP DS 7 KIVP DS FDQ EHXVHG DVDQRWKHUWRROIQ FRQFXUUHQFHZ LWK VDJ H
J URXVHEIRRJ\ ORFDONQRZ OHGJ HRI WKHDUHD EIRRJ LWDQG WWDP HW\ SRIQW WR DFFHWVD
VSHFLIF DUHD WKDWQHHGVWR EHHMDOXDWG DWD SURWHFWOHVHD $ OR IWVIQDS SURSUDWWIRU WKH
WW[WWR UHOHFWWKHFRQVXOWQW FKDQJHIQ VDJ H J URXVHKDEIWWDFUHDJ H 1 HVWKHU %DUUIN QRU
WKHFRQVXOWQWGHWWLP IQHVZ KDWFRP SUVHDGHTXDWWVDJ H J URXVHKDEIWW DQG WKH% 0 3 3 +
DQG 3 * + KDEIWWDFUHDJ HVVKRXOG EHUHOHFWWG IRU WKH+ & &8 (3 SURWHFWDUHD $ GGLWRQDO
% 0 VKRXOG EHXVIQJ WKHQHZ KDEIWWP DS DQG VHHNIQJ JXIGDQFHIURP WKH% 0 WWWWRIIIFH
DVWR KRZ WKIVUHDWWG WX 3 3 + 3 * +

5 HSRUWQJ WKH(6&2 GDWIQ WKH($ UHOHFW WKHZ RUNGRQHWX HYDOXDWJ UHDWUVDJ H J URXVH
KDEIWWWQ WKH3 OOQ ERXQGDU %/ 0 DFNQRZ OHGJ HVWKDW ' 2 : GRHVQRWDJ UHZ LWK RUFRQFXU
Z LWK WKH* UHDWU6 DJ H J URXVHKDEIWWP DS WKDWSSHDVIQ) IJ XUH RI WKH($ KRZ HYHU WKH
J UHDWUVDJ H J URXVHKDEIWWP DS SUHVHQWG IQ) IJ XUH IV WKHUHXOWRI DFRODERUDWYH SURFHVV
EHWZ HHQ %/ 0 %DUUIN DQG IWFRQVXOWQWWKDWQFOXGHG IQSXWDQG UHFRP P HQGDWRQVIURP
1 ' 2 : ' UDWP DSVZ HUHSURYIGHG WX 1 ' 2 : IRUFRP P HQWDQG IQSXWGXUIQJ WKHSURFHVVRI WKH
IQYHWWJDWRQ DQG FKDQJHVIQ DFUHDJ HEDVHG RQ WZ R IIHG YLWWE\ %/ 0 DQG 1 ' 2 : Z HUH
IQFRUSRUDWG 7 KH UHXOWRI WKH IIHG IQYHWWJDWRQ DQG FRODERUDWYH SURFHVVIVGRFXP HQWG IQ WKH
) IHG, QYHWWJDWRQ 5 HSRUW$ SSHQGI[' RI WKH($

7 KH($ QRZ IQFRUSRUDWWVUHFHQW HYDGD%/ 0 J XIGDQFHSURYIGHG IQ ,0 1 9 GDWG
) HUXDU %/ 0 Z KIFK IQFRUSRUDWWVWKHIROORZ IQJ QHZ * UHDWUVDJ H J URXVHKDEIWW
FDWJ RUHVEDVHG RQ 8 6* 6 P DSSIQJ E\ &RDWWVHWDO + IJ K HTXLYDOHQWWX WKHSUHYRXV 3 3 +
GHMJ QDWRQ 0 RGHUDW HTXLYDOHQWWX WKHSUHYRXV 3 * + GHMJ QDWRQ / RZ DQG 1 RQ KDEIWW$
UHYIVHG P DS VKRZ IQJ WKH8 6* 6 FDWJ RUHVZ LWKIQ WKH3 URWHFWDUHD IVIQFOXGHG IQ WKH($ DV) IJ XUH
D

%/ 0 DFNQRZ OHGJ HVWKDWWKHP DSVJ HQHUDWG E\ (6&2 DUHWX EHXVHG DVDQRWKHUWRROIQ
FRQFXUUHQFHZ LWK VDJ H J URXVHEIRRJ\ ORFDONQRZ OHGJ HRI WKHDUHD DQG RWKHUP DWUDOV WX
GHWWUP IQHVDJ H J URXVHKDEIWWWQ WKH+ & &8 (3 %/ 0 Z IOOXVHWKHP RWWFXUUHQWKDEIWWP DS DQG

VHHNJ XLGDQFHIURP WKH%/ 0 WDWXVRIIIFHDVQHHGHG DVWRGDWDIQWLSUHWDWRQDQG UHDWRQWRRGHU KDEWDWP DSV

%/ 0 KDVP RGLIHG WKHWH[WQWKLVVHFWRQWRFRUUHFWWDWP HQWUHJDUGLQJ WKH0 D\ IIHGWWS DQG P RUHFHDL\ WDWWKDWWKH(6&2 * UHDWUVDJ HJ URXVHKDEWDWP DS Z DVQRWWKHUHXXOWRI D FRQXXOWQW¶FKDQJHIQ VDJ HJ URXVHKDEWDWDFUHDJ H 7KHSURSRVHG WH[WWV

As a result of field investigation and field review, Barrick and its consultant (ESCO), developed the ESCO Habitat Map of Greater sage-grouse PPH and PGH from 5 Years of Vegetation Survey Data (ESCO greater sage-grouse habitat map) Error! Reference source not found.. This habitat map was based on a detailed assessment of the vegetation mapping conducted from 2009 to 2014 by ESCO and a field trip. The field trip was conducted in May 2014 with Barrick, ESCO, BLM, and NDOW. NDOW and BLM made a subsequent return trip to the area. Following the return trip, BLM provided input and review to the ESCO greater sage-grouse habitat map. The ESCO report that details the methods applied in developing Figure 3-11 is included as ***Appendix D****.*

Figure 3-11 shows 3,263 acres of PPH identified in HC/CUEP. Of this, there is no Essential/Irreplaceable Habitat as defined by NDOW, all the PPH is classified as Important Habitat, as defined by NDOW. Figure 3-11 shows 5,110 acres of PGH. There are 13,651 acres of low value habitat and 282 acres of non-habitat (ESCO 2014b)

The ESCO Greater sage-grouse habitat map may be utilized as another tool, in combination with the BLM greater sage-grouse habitat map, other sage-grouse population data collection, and habitat assessment methods, to assist the BLM in determining potential future sage-grouse habitat impacts that may result from proposed activities within and surrounding the HCCUEP boundary.

&RPP HQW) LJ XUH &KDQJHWKHQDP HRI WKHP DS WR EHWWU UHIOHFWLW WXHIQWQWDVD YHJHWDWRQ P DS

5 HVSRQVH 7KHIQWQWRI) LJ XUH LVWR VKRZ DP RGLIHG P DS RI * UHDWUVDJ HJ URXVHKDEWDW EDVHG RQ IIHOGIQYHWW DWRQ DQG IIHOGUHYLHZ 7KHIIHOGIQYHWW DWRQ IQFXGHG DUHYLHZ RI YHJHWDWRQ FRP P XQLWHV EXWWKHIQYHWW DWRQ Z DVQRWDP IWG WR YHJHWDWRQ IQIRUP DWRQ DVVXFK WKHP DS IQ) LJ XUH UHOHFWVDJ HJ URXVHKDEWW) LJ XUH LVWWHG ³%/ 0 3UHDP IQDW +DEWW0 DS * UHDWU6DJ HJ URXVH33+ DQG3* +´

7KHIIJ XUH IQWKH($ FXUUHQW WWH³) IHOG,QYHWW DWRQ RI * UHDWU6DJ HJ URXVH33+ DQG 3* +´ KDVEHHQ FKDQJHG WR³(6&2 +DEWW0 DS RI * UHDWUVDJ HJ URXVH33+ DQG3* + IURP <HDUVRI 9HJHWDWRQ6XUYH\ ' DW´

&RPP HQW 3J 7KHKLJK FRXQWRI P DOHVDJ HJ URXVHDWWKH1 HZ %URFN &DQ\RQ OHN IQ Z DV QRW DVUHSRUWHG

7 KHUHSRUWG KLJ K FRXQWRI P DOHVDJH J URXVHDWWKH1 HZ %URFN&DQ\RQ0NIQ DVUHSRUWG
E\ $ 5&$ ' ,6 LV 7 KHW[WRI WKH($ KDVEHHQ P RGLIIHG WR UHOHFWWKLVFRUUHFWRQ

&RP P HQW 3 J 2 YHUDOOWKHQRLVHFRQWRQDQG DQDO\VLVYHU\ IQDGHTXDWLQWLP V RI VDJHJURXVHDQG QRLVHGLWXUEDQFH 1 RQHRI WKHQRLVHDP EIHQWGDWFRQWRQ RU WKH DQDO\VLVIRQRZ IQJ WKHJXLGHOLQHVRI WKHOWWWUHHDUFK DQG WKHIRUP RWH[SHUWQ QRLVH IP SDFW WR VDJHJURXVH VHSUHYRXVFLWWWRQV 1 ' 2 : Z RXOG WWRQJO\ VXJJHWWKDWQRLVH GDWEHFRQWFWG DJDIQ XVLQJ WKHDSSURSUDWP HWFFVWR P RGHOFXUHQWQRLVHDQG DQWFIS DWG QRLVHRQ WKHOQGVFDSHWR DGHTXDW\ DWWHWWKHDQWFIS DWG IP SDFWWR VDJH JURXVH / HT IVWKHHTXLYDOHQWFRQWLQXRXVQRLVHOYHOQG IVFDOFXOWWG E\ IQWJ UDWQJ WKH HQHUJ\ IQ WKHVRXQG RYHU WKHHQWLHP HDXUHP HQWDQG GLYLGLQJ E\ WKHWP HSHUURG WR GHWLP IQHWKHHTXLYDOHQWQRLVHOYHOI WKHQRLVHZ HUHFRQWWQW7 KHWP HSHUURG FDQ UDQJH DQ\ZKHUHIURP RQHVHFRQG WR KRXUV) RU QRLVHVRXUFHVZ IWK UHDWWYH) FRQWQXRXVQRLVH RXWSXW/ HT IVFRP P RQ) XVHG DVD GHWHFUIS WRU / HT IVIQIOXHQFHG P RUHE\ ORXG QRLVHHYHQW HYHQ II WKH DUHUHDWWYH) EUH WKDQ E\ TXIHWU QRLVHHYHQW WKDWDUHIUHTXHQW7 KXV WKH / HT P HWF P D\ QRWEHIGHDOIRU GHWFUEIQJ IQWLP IWWQWQRLVHVRXUFHV VXFK DV WDIIIF QRLVHZ KHUHQRLVHHYHQW DUHUHDWYH) TXIHWEXWUHTXHQW8 VIQJ / FRXOG UHWRYHWKHEIUG QRLVHGXUQJ P RQIWRIQJ WKDWIVDWWEXWQJ WR WKHVSINHVIQ WKHQRLVHDQD) VIV / IVXVHXO EHFDXVHIWIVOHWVIQIOXHQFHG E\ WKHEUH IQWXGIQJ VRXQGV WKDWFDQ GRP IQDWWRWKHUP HWFV / IVUHFRP P HQGHG EHFDXVH RWKHZ IVH EIUGV IQWFWDQ RWKHUIQGIFDWRUVRI D KHDOWK\ KDEIWWP D\ EHFRXQWWG DJDIQWFRP SOIDQFHV7 KH/ VKRXOG EHXVHG IRUHWWEOWKIQJ D FXUUHQWEDVHIQHDP EIHQW$ P EURVHDQG) ORUDQ) URP WKHSUHVHQWWG DQD) VIV IWIV XQFOHDUZ K\ WKHQRLVHOYHOVDUHGHSIFWWG DVD ZIGHUDQJH " + RZ Z IOWKH%/ 0 DQG 1 ' 2 : EHDEOHWR DWWHW WKH G%$ WKUHWKROG IL WKHQRLVHYDOXHVSURYIGHG DUHD UDQJH' : IOWKH%/ 0 DQG 1 ' 2 : XVHWKHEHWDYDIODEOHVFHQFHWKDWWWWW WKDWDP EIHQWUDQJHV IURP IQ WKH* UHDW%DVIQ'

5 HVSRQVH %DUUIFN¶VFRQVXOWQWKDYHSUHSDUHG DWFKQIFDOP HP RUDQGXP UHYIHZ HG E\ %/ 0 WKDVURSRVHVEDVHIQHQRIVHWKUHKROGVIRUWKHSXI$RVHVRI HYDOXDWQJ QRIVHIP SDFW WR QHDE\ OHNVGXUIQJ EUHGIQJ VHDVRQ IURP WKH3URSRVHG 3URMFW$ WWFKP HQW %DVHIQHGDWKDVEHHQ FRQHFWG IRUWKH+ & &8 (3 DQG Z DVUHSRUWG IQ$ 5&$ ' ,6 (P SIUFDOEDVHIQHGDW FRQHFWG IRORZ IQJ 1 ' 2 : DQG %/ 0 J XIGDQFH Z DVFRQHFWG IURP WKH3URMFWDUHD DWZZ R DFWYHOHNV 7 KHSURSRVHG EDVHIQHQRIVHWKUHKROGVFDQ EHXVHG WR FRP SDUHWR WKH G%$ WKUHKROG IGHQWIHG IQ%/ 0

7 KHFRP P HQWWKDWWKHQRIVHGDWGIG QRWRORZ J XIGHIQHVDQG OWWWUHHDUFK WR FRQHFWWKHGDW IVIQFRUUHFW7 KH$ 5&$ ' ,6 WWG\ IRORZ HG WKH%/ 0 DSSURYHG Z RUNSOIQ $ 5&$ ' ,6 E Z KIFK XVHG DSSURSUDWP SURWFROV DQG J XIGDQFH IQFOXGIQJ %/ 0 DQG 1 ' 2 : J XIGDQFHRQ P HDXUHP HQWSURWFROV 7 KHGDWDQD\VIVDSSURDFK IQ$ WWFKP HQW XWI]HV WKH OWWWJ XIGHIQHVDQG UHVHDUFK IQFOXGIQJ P HWKRGVGHWFUEHG IQ$ P EURVHDQG) ORUDQ DQG 3DWIFHOLHWO WR DQD\]HWKHGDWDQG GHWPP IQHD VXIWWEOHEDVHIQHDP EIHQWWKUHKROG 7 KHWHP HWKRGVDUHGHWWOHG IQ$ 5&$ ' ,6 DQG IQ$ WWFKP HQW $ VDSRIQWRI QRWW WKH

$ P EURVHDQG) ORUDQ VWXG\ Z DVQRVXEOLVKHG XQGHU0 D\ Z KLFK Z DVDLWUWKH
+ & &8 (3 QRLVHP RQLWRULQJ VWXG\ E\ $ 5 &$ ' ,6 Z DVFRP SOHWHG + RZ HYHU WKHSURWRFROV
GHVFULEHG LQ$ P EURVHDQG) ORUDQ DUHDOR FRQVLVWHQWZ LWKHDUOHUXLGDQFHFLWHG E\
$ 5 &$ ' ,6

7 KHWHFKQLFDOP HP RUDQGXP $ WWDFKP HQW GDWHG -DQXDU\ LQFOXGHVDP EIHQWQRLVHWKUHVKROGV
EDVHG RQ/ UDWHUWKDQ/ / LVWHP RUHDSSURSULDWHSURWRFROWX XVHIRUWKLVSXUSRVH DVLW
LDFWRUVLQ WSIFDOEDFNJ URXQG QRLVHVRXUFHV

7 KH($ KDVEHQ FKDQJ HG DVIRORZ VWR UHOHFWWKHXVHRI WKH/ P HWUF DVGHWHUPLQG LQ
$ WWDFKP HQW $ 5 &$ ' ,6 DQG WR UHSRUWDVLQJ OHYDOXHIRUWKHEDVHOLQH WKUHVKROG LQ SOD FHRI
DUDQJH

1 RLVH P RQLWRULQJ UHXXOW UHSRUWWG EHORZ LQFOXGH GDWD FRORHFWWG IURP DP WX DP DOO
P RQLWRULQJ GD\ VIURP 0 DUFK WKURXJ K0 D\ FRP EIQHG

7 KH QRLVH P RQLWRULQJ GDWD DWWKH+ RUVH &UHN / HN $ 5 &$ ' ,6 D $ 5 &$ ' ,6 VLWH
VKRZ VWKHIRORZ LQJ

- 0 LQ/ G%$
- 0 DI / G%$
- / LQHDU0 HDQ/ G%$

7 KHEDVHOLQH QRLVHWKUHVKROG DW+ RUVH&UHN / HN Z DVFDOFXODWG DV $ 5 &$ ' ,6

7 KH QRLVHP RQLWRULQJ GDWD DWWKH1 HZ %URFN &DQ\ RQ/ HN $ 5 &$ ' ,6 D $ 5 &$ ' ,6
VLWH VKRZ VWKHIRORZ LQJ

- 0 LQ/ G%$
- 0 DI / G%$
- / LQHDU0 HDQ/ G%$

7 KHEDVHOLQH QRLVHWKUHVKROG DW1 HZ %URFN &DQ\ RQ/ HN Z DVFDOFXODWG DV $ 5 &$ ' ,6
, WWKRXOG EH QRWWG WKDWWRSRJ UDSKIF IHDXUHVEHWZ HHQ WKH1 HZ %URFN &DQ\ RQ/ HN DQG
+ RUVH&DQ\ RQ KDYHEHHQ IGHQWIHG WKDWZ RXOG SUHFXGHILWURP H[SHUHQFLQJ QRLVHHIHFWIURP
+ & &8 (3 H[SORUDWRQ DFWXYLWHV

7 KH G%$ DP EIHQWWKUHVKROG UHSRUWWG E\ $ P EURVHDQG) ORUDQ GRHVQRWUHOHFW
DP EIHQWQRLVHIQ WKH* UHDW%DVQ 5 DWHU WKLVWKUHVKROG Z DVGHULYHG IURP P HDXUHP HQW
FRORHFWWG IQ DZ IOGHQHVVDUHDRI : \RP IQJ GXUQJ DQDURZ WP HUDP H QJ KWDQG FDOP
P RUQIQJ VRQ\ GXUQJ VSUQJ WP H $ VDOR UHFRP P HQGHG E\ $ P EURVHDQG) ORUDQ XVLQJ
VLWH VSHFLIF EDVHOLQH GDWZ IOOEHDP RUHDFFXUDWDQG DUHOLEOHP HDQVZ LWKZ KIFK WKHYDXDWW
SRWQWDOQRLVHIP SDFWWKDFWXHOHNV UDWHUWKDQ DVXP IQJ DWKUHVKROG WKDWZ DVEDVHG RQ GDWD
FRORHFWWG HOWHZ KHUHWRI XOIOOGIIHUHQWSURNHFWRENHFWXHV

7 KHEDVHOLQHQRLVHGDWZ DVFRQHFWG DFFXUDWO DQG DSSURSULDWO DQG WKHGDWFDQEHXVHG WR HVWDEOLVK EDVHOLQHQRLVHWKUHVKROGV 7 KHUHRUH WKHUHVKRXOG EHQR UHDVRQ WKDWP EHQWQRLVHGDW EHFRQHFWG DJ DLQ

&RP P HQW 3 J $ QRWKHUIQDFFXUDF\ RI WKHQRLVHFRQHFWRQ DQG DQDO\VLVLV WKDW IQFUHDVHG QRLVHOHYHOVZ HUHDWWEXWG WR ZIQG , I WKHDSSURSULDWMSURWFRVDQG WKHEHW DYDLODEOHVFHQFHZ HUHEHQJ XVHG WKLVGRFXP HQWZ RXOG UHOHFWWKDWZ IQG OHYHOVGR QRW DWWEXWWWR IQFUHDVHQRLVHERWK GXUIQJ HWWEOWKIQJ DP EHQWDQG GXUIQJ P RQLWRUIQJ 7 R HWWEOWK DP EHQWGDWVKRXOG EHFRQHFWG XQGHUFDOP FRQGLWRQV XVIQJ DSSURSULDWO VHQVWYHHTXISP HQWDQG ZIWK ZIQG P XIOQJ GHYFHV : KLOHP RQLWRUIQJ ZIQG VSHHGVRYHU P SK VKRXOG EHH[FXGHG IURP WKHDQDO\VLV $ OORI WKLVVKRXOG EHIQFRUSRUDWG IQWR WKH SURWFRODVGHWWOHG E\ $ P EURVHDQG) ORUDQ

5 HVSRQVH 7 KH$ 5 &$ ' ,6 WXG\ IRORZ HG WKH%/ 0 DSSURYHG ZRUNSODQ $ 5 &$ ' ,6 E ZKIFK XVHG DSSURSULDWMSURWFRVDQG JXIGDQFH IQFXGIQJ %/ 0 DQG 1 ' 2 : JXIGDQFHRQ P HDXUHP HQWSURWFRV DQG DSSURSULDWHTXISP HQW7 KHGDWDQDO\VLVDSSURDFKIQ $ WWFKP HQW XWLO]HVWKHOWWWJXIGHOQHVDQG UHVHDFK IQFXGIQJ P HWKRGVGHVFUEHG IQ$ P EURVH DQG) ORUDQ DQG 3 DWLFHOLHWO WX DQDO\]HWKHGDWDQG GHWUP IQHVXIWEOHEDVHOQH QRLVHWKUHVKROGV ' DWFRQHFWRQ DQG DQDO\VLVP HWKRGVDUHGHWUOHG IQ$ WWFKP HQW $ VDSRIQW RI QRWW WKH$ P EURVHDQG) ORUDQ WXG\ ZDVQRWSXEOWKHG XQWO D\ ZKIFK ZDV DIWUWKH+ & &8 (3 QRLVHP RQLWRUIQJ WXG\ E\ $ 5 &$ ' ,6 ZDVFRP SOHWG + RZ HYHU WKH SURWFRVGHWFUEHG IQ$ P EURVHDQG) ORUDQ DUHDOR FRQWWQWZ IWK HDUOHUJXIGDQFH

$ OOSUHFDXWRQVZ HUHP DGH WR HQXUH TXDOOW RI GDWP HDXUHP HQW IQFXGIQJ XVIQJ WKHEHW DYDLODEOHHTXISP HQWGHSOR\HG E\ H[SHUHQFHG QRLVHSURIHWWRQDOV IRORZ IQJ WKHEHWDYDLODEOH VFHQFHDQG JXIGDQFH $ VGHWFUEHG IQ$ 5 &$ ' ,6 ZIQG VFUHHQVDQG VRXQG OHYHOP HWWUV RI WKHVDP HP DNHDQG P RGHOXVHG E\ $ P EURVHDQG) ORUDQ ZHUHXVHG IQ WKH$ 5 &$ ' ,6 WXG\ 1 RLVHGDWZ DVFRQHFWG GXUIQJ FDOP ZIQG FRQGLWRQV DQG ZIQG VSHHGVH[FHHGIQJ P V ZHUHH[FXGHG IURP WKHGDWDQDO\VLVSUHVHQWG IQ$ WWFKP HQW

7 KHHIHFWRI ZIQG RQ QRLVHOHYHOVLVDFRP P RQ REVHUYDWRQ HYHQ ZIWK WKHXVHRI ZIQGVFUHHQV DV GHWFUEHG IRUH[DP SOHIQ%DFNOH DQG 3 DWLFHOL ZHDWKHUWWWRQ GDWDLVIP SRUWQWW IQFXGHHEHFDXVHWKHHHP HDXUHP HQWFDQ IQIOXHQFH QRLVHOHYHOV 1 HYHUWKHOHW QRLVHGDWZ DV FRQHFWG GXUIQJ FDOP ZIQG FRQGLWRQV DQG ZIQG VSHHGVH[FHHGIQJ P VZ HUHH[FXGHG IURP VXEVHTXHQWGDWDQDO\VLV 7 KHUDWRQDOH DV WWWWG IQ$ P EURVHDQG) ORUDQ DQG %DFNOH DQG 3 DWLFHOL IRUH[FXGIQJ QRLVHGDWFRQHFWG GXUIQJ ZIQG FRQGLWRQVRYHU P VIV EHFDXVHWKHQRLVHHTXISP HQWZ IQG VFUHQVDUHUDWG RQ XS WX P V + RZ HYHU ZIQG IOXFWXDWRQVEHORZ P VFDQ WXOOP SLFWQRLVHOHYHOV DQG WKLVLVDFNQRZ OHGJ HG IQ WKH$ P EURVH WXG\ DQG E\ RWKHUV $ VZ IQG VSHHGVIQFUHDVH QRLVHOHYHOVIQFUHDVHGXHWX QRLVHJ HQHUDWG IURP WKHJ URXQG SODQWVUFWRQ DQG ZIQG WXUEXOHQFH

7KH WWFKQLFDO HP RUDQGXP $ WWFKP HQW GDWG-DQXDU ICFXGHVDP EIHQWQRLVHWKUHVKRGV EDVHG RQ/ UDWKHUWKDQ/ / IVWKHP RUHDSSURSUDWHSURWFRQWXXVHIRUWKLVSXUSRVH

&RP P HQW 3J) IHG YHUIIFDWRQ 7KH($ VWDWXVWKDWIHG YHUIIFDWRQ ZIOORQ0 KDSSHQ IL WKH(6&2 YHJHWDWRQ P DS FRQIOFWZ IWK WKH% 0 VDJHJURXVHKDEIWDWP DS IQ RQ0 QRQ KDEIWDW: KDWI WKH(6&2 YHJHWDWRQ P DS UHGXFHVWKHYDOXHRI VDJHJURXVH KDEIWDWZ IOOIHG YHUIIFDWRQ WWKOEHQHFHWDU\ " 7KIVDSSURDFK IDYRUVWKHSURSRQHQWDWWKH H[SHQVHRI HUUIQJ RQ WKHVIGHRI WKHEILG

5HVSRQVH 7KHWWDWP HQWRQSDJH IV

The BLM may elect to conduct field verifications of on the ground conditions, especially in areas where there is not concurrence of non-habitat for sage grouse according to the BLM Preliminary Habitat Map and the ESCO field investigation map. Actual sage grouse improvement acreage may be adjusted based on those BLM field investigations. The BLM would commit to conducting any such sage grouse habitat field investigations prior to the initiation of surface disturbing activities.

7KIVWDWP HQWGRHVQRWWD\ WKDWIHG YHUIIFDWRQ ZIOORQ0 KDSSHQ IL WKHKDEIWDWP DSVDUH FRQIOFWQ 7KHWWDWP HQWSRIQWRXWWKDWIHG YHUIIFDWRQ P D\ IRFXVRQ DUHDVZ KHUHWKHP DSV FRQIOFW7KHIIHG YHUIIFDWRQ GHVFUSWRQ GRHVQRWDYRUQHP DS RYHUWKHRWKHU QRUWKH SURSRQHQWRYHUWKHEILG) XUWKHU WKH($ QRZ IQFRUSRUDWHVUHFHQW LHYDGD%/ 0 JXLGDQFH SURYIGHG IQ,0 1 9 GDWG) HEUXDU %/ 0 ZKIFKIQFRUSRUDWHVIP SURYHG P DSSIQJ DQG QHZ JUHDWUVDJHJURXVHKDEIWDWFDWJRUHVEDVHGRQ8 6* 6 P DSSIQJ E\ &RDWVHW DO

&RP P HQW 3J : KDWZ IOOEHWKHGIWDQFHDWRHDWG ZIWK WKHDYRIGDQFHEXIIHUIRU S\JP\ UDEEIW'

5HVSRQVH 7KH($ KDVEHHQ UHYLVHG WX IQFXGHWKHIRORZ IQJ IQ VHFWRQ

Pygmy Rabbit

Barrick will not conduct surface disturbing activity within habitat identified as suitable to support pygmy rabbit until a pre-disturbance survey has been conducted. If active burrows are identified Barrick would notify BLM to evaluate the potential impact and coordinate with Barrick to devise and implement measures to minimize impacts to the pygmy rabbit and its habitat. These measures may include avoidance.

7KH($ KDVEHHQ UHYLVHG WX FRUUHFWWKHRP LWIRQ RI WKHZ RUG µLIIHFW¶WX WKHIRORZ IQJ VHQWHQFH
[3] *Since pygmy rabbits are not able to disperse across large areas of non-habitat, loss and fragmentation of suitable sagebrush habitat within HC/CUEP may individuals."*

**&RP P HQW 3 J &XP XODWLYH(IIHFW $ FWLYHOHNVDUHNQRZ Q WR REFXULQ WKH + & &8 (3 YLFLQLW KRZ HYHU QRLVHDQG KXP DQ SUHVHQFHGRHV/QRWDSSHDU WR DIIHFWOHN XVHDW + & &8 (3 7 KHSURSRVHG VDJHJURXVH(30 Z RXOG P ILQLP L]HHIIHFWR QRLVHDQG KXP DQ SUHVHQFH , WFDQQRWEHWDWWG WKDWQRLVHDQG KXP DQ SUHVHQFHKDVQRWDIIHFWG WKHOHNV 7 KLVLVXQIRXQGHG DQG FRP SOHWH) FRXQWU WR WKHVFLHQWLF OWUDWXUH 7 KHUHKDVEHHQ QR GDW FROHFWRQ WR VXSSRUWWKLV WDWP HQW VR WKLV VKRXOG EHUHP RYHG DVIWLVHLURQHRXV ' DW FRXOG VXJJHWWKDWUHFHQWP IQIQJ H[SORUDWRQ DFWYLW KDVKDG D QHJDWYHHIIHFWRQ WKH+ RUVH &UHHN OHN , Q WKHSHDN P DOHDWWQGDQFHZ DV P DOHVDJHJURXVHEXWGURSSHG WR IQ Z ITWK IQ ERWK DQG 7 KLVZ DVZ KHQ WKHIILWH[SORUDWRQ DFWYLWHVDW + &&8 (3 RFFXUUHG 7 KHOD\ GRZ Q\ DUG GULOOLJ VFORVH) DWRFIDWG Z ITWK WKLVSURWFWDQG WKHIQFUHDVHG URDG QRLVHIURP WKHIQFUHDVHG WDIIIF DWRFIDWG Z ITWK WKLVSURWFWWKRXOG DOOEH DSSURSUDWW) DFFRXQWG IRUIQ DQ\ WDWP HQWDERXWHIIHFWFDQ EHP DGH

5 HVSRQVH %/ 0 KDVP RGIIHG WKHUHHUHQFHG VHQWQFHIQ VHFWRQ WR WKHIRORZ IQJ

There are no active leks in the Project boundary, but active leks are known to occur within four miles of the Project. The proposed greater sage-grouse EPM (page 2-11) would limit the amount of noise increase allowed, which would minimize effects at active leks from noise and human presence.

&RP P HQW 2 YHUDUFKIQJ FRP P HQW

- **D 6IQFHWKLVSURWFWLVH[SORUDWRQ WKHHDVHWZ D\ WR DOOWLDWWKHP DNRUW RI VDJH JURXVHQRLVHFRQFHLQVZ RXOG EHWR HP SOR\ VHDVRQDOWP IQJ UHWWLFWRQVIURP 0 DUFK WKURXJK - XQH WR DOOH[SORUDWRQ DFWYLWHVZ ITWKIQ WKH P IOHEXIIHUR DOOOHNV 7 KLVUHWWLFWRQ UHGXFHVIP SDFW WR EUHGIQJ DQG QHWWQJ VDJHJURXVHZ ITWKIQ WKH P IOHEXIIHU 0 DQIHUHWDO**
- **E 7 KHVDJHJURXVHQRLVHGDWD DQG DQDO\VLVIVFRP SOHWH) IQDGHTXDWHDQG FDQQRWEH XVHG WR P DNHDQ\ DWHWP HQWRI H[ITWQJ FRQGIWRQVRUIXWXUHDQWHISDWG IP SDFW**
- **F &XP XODWLYHHIIHFWIQDFFXUDW) DQG IQFRP SOH) DGGUHWVHG IRUD0ZIOGOIH UHWRXUFHV**

5 HVSRQVH D $ VRXWQGHG IQ VHFWRQ RI WKH($ %DUUFN Z RXOG DGKHUHWR(30 VDV HWWEOWKHGE\ WKH%/ 0 IRUJ UHDWUVDJ HJ URXVHOHN WWXWQJ J URXQGVDQG IRUNQRZ Q QHWWQJ DQG EURRG UHDUIQJ DUHDV 1 RIVHJ HQHUDWG E\ H[SORUDWRQ DFWYLWHVZ RXOG QRWQFUHDVHP EIHQWOHYHOV E\ $ Z HJ KWG GHFIEHOV G%$ DWDFWYLHOHNVEDVHG XSRQ%/ 0 WWSXDWRQV %/ 0 F 7 KH (30 IVDSSOFDEOHWR SRWQWWO) DIIHFWG DFWYLHOHNVZ ITWKIQ IRXUP IOHVRI WKH+ & &8 (3 Z KIFK FXUUHQW) IQFOXGHWKH+ RUVH&UHHN / HNDQG WKH1 HZ &RUW] ± * UDW9 DOOH\ / HN 7 KH1 HZ %URFN&DQ\RQ/ HNIVH[FOXGHG IURP WKH(30 GXHWR WSRJ UDSKIFDOIHDXUHVZ KIFK UHGXFHRU HOP IQDWQRIVHJ HQHUDWG IURP WKH3 URSRVHG $ FWRQ 7 KH(30 IVVXEMFWWR UHYIHZ E\ D%/ 0 EIRORJ LWDQG P D\ EHDGXWWG EDVHG RQ DQ\XDOVXUYH\ VRI OHN DFWYLW 8 SRQ IGHQW\ IQJ DQ\ SUHYRXV) XQNQRZ Q J UHDWUVDJ HJ URXVHOHN WWXWQJ J URXQG RUQHWWQJ RUEURRG UHDUIQJ DUHD %DUUFN Z RXOG IP P HGIDWG) QRW\ WKH%/ 0**

7 R SUHYHQWHIHFWDWDNVIURP SRWQWDOLQFUHDVHVIQ QRLVH %DUUFN Z RXOG IP SOHP HQWRXQG
UHGXFWRQ P HDXXHVZ KIFK P D\ IQFOXGHVRXQG P RGHOQJ DVSHU%/ 0 SURWRFRO %/ 0 F
SOHFHP HQWRI DVRXQG EDUUHUDWGUOOUJ V RUUHWWFWRQ RI GUOOQJ RSHUDWRQVGXUQJ VHDVRQDOOQG
GDO\ WP IQJ SHURGV ,I WKHVRXQG P RGHOQJ VKRZ VQR SURWHFWG IQFUHDVHIQ QRLVHOHYHOVDERYH
G%$ QR DGGLWRQDOP HDXXHVDUHQHHGHG ,I WKHVRXQG P RGHOQJ VKRZ VDQ IQFUHDVHIQ QRLVHOHYHOV
DERYH G%$ RUIL QR P RGHOQJ IVFRQGXFWG %DUUFN Z RXOG IQWWOOVRXQG EDUUHVV OQHO KD\
EDOHVRUVP IQDUP DWUDO DWWKHGUOOUJ RUZ RXOG DGKHUHWX VHDVRQDOOQG WP HRSHUDWRQDO
UHWWFWRQV 7 KHUHWWFWRQVZ RXOG EHIQ SOHFHIURP 0 DUFK WKURXJK 0 D\ IURP DP WX
DP %/ 0 F

5 HVSRQVH E 3OHDVHVHHWKHUHVSRQVHWX 1 ' 2 : &RP P HQW DQG 5 HVSRQVH F 7 KH
DSSURDFK WX DGGUHVVFXP XODWYHHIIHFWVIQWRGXFHG IQ WKH($ VHFWRQ RI WKHGRFXP HQW$ V
WXWXG IQ WKIV VHFWRQ ³7 KHFXP XODWYHHIIHFWDQDO\VIVIQ WKIV($ WHVRII RI DQG H[SDQGVWKH
DQDO\VIVIQ WKH&RUW] + IQOV) (,6 %/ 0 F ´ 7 KHWHUIQJ Z DVGRQHWX HOP IQDWUHGXQGDQF\
IQ WKIVGRFXP HQW1 (3$ DQDO\VIV

(DFK UHVRXUFHGIVFXVVRQIQ &KDSWU IGHQWIHVGIUHFWDQG IQGIUHFWHIIHFW Z KIFK DUHWKHQ
FDUUHG IQWX WKHFXP XODWYHIP SDFWGIVFXVVRQV) RUZ IOOOIHUHVRXUFHV GIUHFWP SDFWZ HUH
IGHQWIHG WX EHORFDO] HG DQG VKRUWWUP DQG IHZ II DQ\ IQGIUHFWP SDFWZ HUHIGHQWIHG IRUWKH
J URXSVRI VHFIHVHYDOXDWG + HQFH FXP XODWYHIP SDFWDERYHDQG EH\ RQG WKRVHGIVFXVVHG IQ WKH
($ DQG DERYHDQG EH\ RQG WKRVHIGHQWIHG IQ %/ 0 DUHQRWDQWFISDWG

1 HYDGD 6 WXWXW&OHDUIQJ KRXVH 6 WXWXW/ DQG 8 VH 3 OQQIQJ $ JHQF\

&RP P HQW $ VSDUWRI WKH($ %DUUFN + RUVH&DQ\ RQ &RUW] 8 QIIHG ([SORUDWRQ
3URWHFWSOHDVHFRQVGHU WKHFXP XODWYHYIVXDOIP SDFWIURP GHYHORSP HQWDFWYIWHV
WP SRUDU\ DQG SHUP DQHQW

5 HVSRQVH &XP XODWYHYIVXDOHIHFWDUHGIVFXVVHG IQ VHFWRQ RI WKH($) URP D
GIVWQFH + RUVH&DQ\ RQ IV YIVIEOHWX WXDYHOHVRQ 6 WXW+ IJ KZ D\ + RZ HYHU WKHDUHDIVIQ WKH
EDFNJ URXQG DQG WKHIRRWKOOVDQG FDQ\ RQVRI WKH&RUW] 0 RXQWIQVKIGHFRP SOHWYIHZ VIURP
DQ\ RQHYDQWJ HSRIQW7 KHUHXXWQJ YIHZ IVDEOHQGIQJ RI WKHIQGIYIGXDOGIWXUEDQFHIHDXUHV
Z IWIQ WKHQDXUDOOQGVFDSH + XP DQ YIVIWXWRQ IVOBZ DQG WKHGIVXUEDQFHIFWYIWHVDUHQRW
Z IWIQ YIHZ RI OJ HSRSXODWRQ FHQWIV 7 KHYIVXDOHIHFWRI P IQIQJ DQG H[SORUDWRQ FFWYIWHV
IQ WKIVDUHDDUHP IQRUDQG DUHFRQVWXQWZ IWK 9 5 0 FODVVREWFWYHV ,P SDFWRI WKH3URSRVHG
$ FWRQ Z RXOG EHP IQIP I] HG RYHUWP HZ IWK UHFOP DWRQ FFWYIWHV WKDWP IP IF WKHEDVF HOHP HQW
RI WKHFKDUFWUIWF OQQGVFDSH

&RP P HQW 8 WQ] HDSSURSUDWWOJ KWQJ

- **8 WQ] HFRQVWXQWQJ KWQJ P IWJ DWRQ P HDXXHVWKDWRQOBZ ³' DUN 6 N\ ´ OJ KWQJ SUDFWFHV**

- **(IIHFWLYHOLJKWLQJ VKRXOG KDYHVFUHHQV WKDWGR QRWDOORZ WKHEXOE WR VKLQHXS RUURXW$ OLS SURSRVHG OLJKWLQJ VKDOOEHORFDWHG WR DYRID OLJKWSRONXWRQ RQWR DQ\ DGMDFHQWDQGVDV YLHZ HG IURP D GLVWDQFH $ OOOLJKWLQJ II[WXUHV VKDOOEH KRRGHG DQG VKLHOHG IDFHGRZ QZ DUG OREDWLQ ZLWKLQ VRIILWDQG GLUHFWLQ RQ WR WKHSHUWLQHQWWLWRQ\ DQG DZ D\ IURP DGMDFHQWSDUFHOVRUDUHDV**
- **$ OLJKWLQJ SODQ VKRXOG EHVXEP LWWG LQGLFDWLQ WKHWSHVRI OLJKWLQJ DQG II[WXUHV WKHORFDWRQVRI II[WXUHV OXP HQVRI OLJKWLQJ DQG WKHDUHDV LOOXP LQDWLQG E\ WKHOLJKWLQJ SODQ**
- **$ Q\ UHTXLUHG) $ $ OLJKWLQJ VKRXOG EHFRQVROLGDWLQG DQG P LQLP LPHG Z KHUHYHU SRVVLEOH**

5 HVSRQVH $ VSDUWRI WKH3 ODQ %DUUFN Z RXOG XWLOLH KRRGHG WWXWRQ\ OLJ KWDQG OLJ KWSODQW / LJ KWLQJ Z RXOG EHGLUHFWLQ RQWR WKHSHUWLQHQWWLWRQ\ DQG DZ D\ IURP DGMDFHQWDUHDV QRWLQ XVH Z LWK VDHW DQG SURSHUOLJ KWLQJ RI WKHDFWYHZ RUN DUHDVEHLQ WKHSUIP DU\ J RDO / LJ KWLQJ II[WXUHV Z RXOG EHKRRGHG DQG VKLHOHG DVDSSURSUDWH %DUUFN Z RXOG XWLOLH OLJ KWLQJ GHVJ QHG WR UHGXFH WKHIP SDFWWR QLJ KWXNHV

&RP P HQW 8 WLOL]HEXLOGLQJ P DWUDOV FRORUVDQG VLWWSOXFHP HQWWKDWDUHFRP SDWEOHZ LWK WKHQDWXUDOHQYLURQP HQW

- **8 WLOL]HFRQVWWQWP LWJ DWRQ P HDXUHVWKDWDGGUHVVORJ LFDOSOXFHP HQWRI IP SURYHP HQWDQG XVHRI DS SURSUDWWVFUHHQLQJ DQG WWXFWXUHFRORUV ([LWLQJ XWLOW FRLLGRUV URDGVDQG DUHDVRI GLWXUEHG ODQG VKRXOG EHXWL]HG Z KHUHYHU SRVVLEOH 3 URDLHUDWRQ RI QHZ URDGVVKRXOG EHDYRLGHG**
- **) RUH[DP SOH VKHXVHRI FRP SDWEOHSDLQWFRORUVRQ WWXFWXUHVUHGXFHVWKHYLVXDO IP SDFWRI WKHEXLOWHQYLURQP HQW8 VLQJ VFUHHQLQJ FDUHXOWLWSOXFHP HQWDQG FRJQLWYHXVHRI HDUWK WKQHFRORUVP DWUDOVWKDWP DWK WKHHQYLURQP HQWP SURYHWKH XVHUH[SHUHQFHIRURWKHUVZ KR P LJ KWKDYHGLIIHUHQWYDOXHVWKDQ Z KDWLVIRWWLHG E\ EXLOWHQYLURQP HQWDFWYLWHV**
- **) HGHUDOOJ HQFHVVKRXOG UHTXLUHWKHHHP LWJ DWRQ P HDXUHVDVFRQGLWRQVRI DS SURYDO IRUDOOS HLP DQHQWDQG WP SRUDU\ DS SOHFDWRQV**

5 HVSRQVH ' HYHORSP HQWRI QHZ EXLOGLQJ VLVQRWSURSRVHG DQG H[LWWQJ WWXFWXUHVDUHP IQIP DO ' LWXUEDQFHLVNHSWWX WKHP IQIP DOLP RXQWQHGHG WR VXSSRUWH[SORUDWRQ DFWYLWHV ,P SDFWRI WKH3 URSRVHG $ FWRQ Z RXOG EHP IQIP LJ HG RYHUWP HZ LWK UHFOP DWRQ DFWYLWHV WKDWP IP IF WKH EDMF HOHP HQWRI WKHFKDUFWUWF OQGVFDSH

* UHDW%DWLQ 5 HWRXUFH: DWK

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&RP P HQW &RP P HQWFRQFHUQLQJ IP SDFW WR: HWWLQ 6 KRVKRQHFXOXUDODVSHFWRI WKH 0 RXQW7 HQDER + RUVH&DQ RQ DUHD

5 HVSRQVH &RRUGLQDWRQ OHWWHUV GHVFUEIQJ WKH SURMHFWZ HUH VHQWRXWWR WKH7 UEDO&RXQFLODQG 7 UEDO(QYLURQP HQWDO HSDUWP HQWRI WKRVH WUEHVZ KR KDYH H[SUHVHG IQWHUHVWQ WKH DUHD 7 KH\ Z HUHIQYLWG WR YLVLWWKH VLWHDQG WR SURYLGHFRP P HQWVDQG IQIRUP DWRQ DERXWZ KDWP D\ EH IP SRUWDQWWR WKHLUWHEHEHRUHDQ\ GHFLVRQ LVP DGH 7 KH($ DQG SURU1 (3$ GRFXP HQW DFNQRZ OHGJ HWKHEHDH VRI VRP H: HWWLQ 6 KRVKRQHDQG WKHSRWQWDOIP SDFWWR WKRVHEHDH V IURP SDWWSUHVHQWDQG UHDRQDE() IRUHVHEDE0HIXXXUHP IQIQJ H[SORUDWRQ DQG RWKHUGHYHORSP HQW 7 KH($ DOR IQFXGHVDQ HYDOXDWRQ RI SRWQWDOIP SDFWWR WKH+ RUVH&DQ\ RQ 3&5 , 7 R WKH H[WQWWKDWWKHFRP P HQWDVNVI RUFKDQJ HV WR WKH 0 IQIQJ / DZ WKDWLVRXWLGHRI WKHVFRSHRI WKLVDFWRQ

&RP P HQW &RP P HQWFRQFHUQIQJ IP SDFWWR: HWWLQ 6 KRVKRQHVSILUXDOYDOXHV

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&RP P HQW &RP P HQW FRQFHUQIQJ % 0 UHTXLUHP HQW XQGHU) / 3 0 $ WR SUHYHQW XQQHFHVDU\ DQG XQGXHGHJUDGDWRQ IQFXGIQJ FXOXUDOGHJUDGDWRQ

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Date:
January 27, 2015

ARCADIS Project No.:
CO001913.0001

Subject:
Proposed Baseline Noise Threshold for the HC/CUEP

Introduction

This technical memorandum describes an approach to determine, and presents the results of, a baseline noise threshold for the purposes of evaluating noise impacts to nearby Greater Sage-grouse (*Centrocercus urophasianus*) leks during breeding season from the proposed Horse Canyon/Cortez Unified Exploration Project (HC/CUEP; the "Project").

Research demonstrates that noise impacts generated by human activities, such as energy development and road travel, negatively impacts sage-grouse behavior and physiology, and therefore lek abundance (Holloran 2005, Blickley et al. 2012, Ambrose and Florian 2014). Acoustic communication is an essential part of the breeding biology of sage-grouse (e.g., Gibson 1989, Gibson 1996, Patricelli and Krakauer 2010). Noise generated from anthropogenic activities at similar frequencies to sage-grouse acoustic signals (i.e., <2.0 kHz) could interfere with sage-grouse reproductive behavior, leading to reduced breeding success and therefore declines in sage-grouse abundance over time (Blickley and Patricelli 2012).

The proposed Project is located in an area where there is current human activity. Roads, mine exploration activities, grazing, and public use of the land contribute to current baseline noise levels. Baseline noise levels were measured by ARCADIS from March through May 2014, and reported in ARCADIS (2014; "the ARCADIS study"). The objective of the ARCADIS study was to characterize and quantify the current noise

environment at two active leks (Horse Creek 01 and New Brock Canyon) during the breeding season. These leks are near to the Project boundary and would be more likely to experience impacts from the proposed Project. Noise level monitoring followed all the same protocols recommended in recent guidance and literature to date, including BLM (2014), which draw upon protocol recommendations made by Blickley and Patricelli (2013), Blickley et al. 2012, and Connolly (2003). At the time of conducting the ARCADIS field work (March through May 2014), a new study by Ambrose and Florian (2014; "the Ambrose study") was in development but not yet available. A full description of the protocols used by ARCADIS and comparison to other guidance is included in the methods section below.

The baseline noise measurements reported in the ARCADIS study can be used to establish a baseline threshold level with which to evaluate subsequent noise impacts to nearby leks during the breeding season from the proposed Project. Guidance is offered by Patricelli et al. (2013) and the Ambrose study on how to compute thresholds. This guidance was considered and incorporated into this memorandum as appropriate to develop an approach to compute a baseline threshold. An important distinction to be made, however, is that the primary objective of Ambrose was to estimate pre-development, ambient noise levels for an area in which an energy development project had already begun. Therefore, the design of the study differs from the objectives of the ARCADIS study in that reference areas outside of the Ambrose project area were monitored as a surrogate to estimate ambient noise levels. The threshold reported by Ambrose represents an estimate, rather than a measurement, of what noise levels are likely to have been before the project's development. In comparison, the purpose of this study is to develop a site-specific baseline noise threshold using empirical data collected at the areas of interest. Recognizing that human activity is occurring in and around the Project, the proposed baseline noise threshold in this memorandum reflects existing baseline conditions rather than estimated conditions in absence of any human activity.

Approach to Computing Baseline Noise Threshold

Ambrose and Florian (2014), Patricelli et al. (2013), as well as BLM (2014) guidance documents were considered in the computation of a baseline ambient threshold. Based on methods presented in the Ambrose study, the baseline noise data was used to compute hourly noise data averaged over the entire monitoring period. Data processing of noise data following this method will reduce the influence of extreme high or low variations. A final determination of a baseline noise threshold(s) for purposes of evaluating impacts to sage-grouse leks should consider the important times of day to the sage-grouse (note that seasonality is also important; the ARCADIS study collected baseline noise data during the strutting season, March through May). Blickley and Patricelli (2013) and Ambrose and Florian (2014) indicate that primary strutting activities occur between 5:00 a.m. and 9:00 a.m.

Patricelli et al. (2013) and Ambrose recommend computing a noise threshold based on either the L_{90} or L_{50} metric. The L_{90} statistical metric typically excludes characteristic human sounds such as vehicle and aircraft sounds, whereas the L_{50} statistical metric, which represents the median of noise levels, will include all sounds in a given area, natural and non-natural.

Data Collection Methods

Baseline noise level monitoring followed the BLM approved workplan (ARCADIS 2014b), which followed all the same protocols recommended in the most recent guidance and literature to date, including BLM (2014), which draw upon protocol recommendations made by Blickley and Patricelli (2013), Blickley et al. (2012), and Connolly (2003). The Ambrose and Florian (2014) study was not published until after the noise monitoring study by ARCADIS was completed, but the protocols described in Ambrose and Florian (2014) are consistent with earlier guidance also. A summary comparison of protocol specifics is provided in Table 1.

Table 1. Comparison of Noise Monitoring Protocols

Monitoring Categories	BLM Protocol	Ambrose / Patricelli et al. (2013) Recommendations	ARCADIS Protocols
Equipment	Type 1 Sound Level Meter. Equipment to monitor meteorological conditions. Audio recordings only if noise sources will be excluded.	Type 1 Sound Level Meter. Equipment to monitor meteorological conditions. Audio recordings to identify noise sources.	Type 1 Sound Level Meter. Equipment to monitor meteorological conditions.
Metrics	L_{10}, L_{50}, L_{90}, L_{eq}, L_{max} L_{min} collected with A-weighted as well as C-weighted and unweighted if possible. 1/3 octave band levels. Sound pressure levels should be recorded at intervals no greater than 5 seconds.	L_{10}, L_{50}, L_{90}, L_{eq}, L_{max} L_{min} collected with A-weighted as well as C-weighted and unweighted if possible. 1/3 octave band levels. All acoustic data to be collected continuously at 1-second intervals.	L_{10}, L_{50}, L_{90}, L_{eq}, L_{max} L_{min} collected with A-weighted as well as C-weighted and unweighted if possible. 1/3 octave band levels. All sound pressure levels were collected continuously at 1-second intervals.
Time Period	24 hours for a 7 day period. BLM protocols recommend during strutting season.	Measurements should be collected for periods longer that 14 days.	24 hours for three, 7-day periods during the strutting season.
Location	Placed at the closest edge of each lek proximate to the proposed disturbance. BLM recommends a height of 1.5 ft (0.45 m) but newer studies, Blickley and Patricelli (2013), recommend 0.3 m	Placed at the closest edge of each lek proximate to the proposed disturbance at a height of 0.3 m	Placed 0.25 miles for the edge of the lek site proximate to the proposed disturbance at a height of 0.3 m

The following equipment was used by ARCADIS to measure existing noise levels:

- Two (2) Larson Davis Model 831 Sound Level Meters, Serial # 2984, 2664
- Larson Davis Model CA200 Calibrator, Serial # 8808
- Two (2) Kestrel 4500 Weather Monitoring Stations, Serial # 606400, 615886
- Low Profile Tripod Assembly

All sound level measurements conducted and presented in this report were collected using equipment that conforms to the American National Standards Institute (ANSI) specifications for sound level meters ANSI SI.4 1983 (R2006). All instruments were maintained with National Bureau of Standards traceable calibrations, per the manufacturers' standards. Further detail on the calibration and equipment deployment can be found in the ARCADIS study.

Upon comparative review of the ARCADIS field protocols to the Ambrose study, it is confirmed that ARCADIS applied the same field methodology as the Ambrose study, with the exception that additional digital recordings were not made. Blickley and Patricelli (2013) cite the use of such recordings in the event that noise events would be excluded from analysis. Alternatively, the study suggests the use of 1/3-octave band frequency profile of the noise (at 1-second intervals) is useful for these exclusions, and this method was followed in the ARCADIS study. Digital recordings were used by Ambrose to distinguish different sources of noise.

Other methods detailed in the Ambrose study were also followed in the ARCADIS study; the baseline monitoring by ARCADIS employed the use of an industry standard windscreen to reduce wind-generated noise, and sound level meters of the same make and model used by Ambrose and Florian (2014). The sound level meters were enclosed in sealed low-profile pelican cases to eliminate wildlife disturbances. The effect of wind on noise levels is a common observation even with the use of windscreens; as described for example in Blickley and Patricelli (2013), weather station data is important to include because these measurements can influence noise levels. Nevertheless, noise data was collected during calm wind conditions, and wind speeds exceeding 5 m/s were excluded from subsequent data analysis. The rationale, as stated in Ambrose and Florian (2014) and Blickley and Patricelli (2013) for excluding noise data collected during wind conditions over 5 m/s is because the noise equipment wind screens are rated only up to 5 m/s. However, wind fluctuations below 5 m/s can still impact noise levels, and this is acknowledged in the Ambrose study and by others. As wind speeds increase, noise levels increase due to noise generated from the ground, plant friction, and wind turbulence.

Blickley and Patricelli (2013) recommends, in addition to a microphone windscreen, to enclose the equipment in environmental housing "where applicable", but doesn't elaborate on the applicability of the housing unit. Subsequent studies and guidance, including the Ambrose study, did not use environmental housing units. Patricelli et al. (2013) reiterates the recommendation to enclose the equipment in an environmental housing unit "for long term deployment," though the length of "long term" is not explained.

Data Analysis

Acoustic metric data analysis used by Ambrose and Florian (2014) and Blickley and Patricelli (2013) was followed for this study. Acoustic metrics (L_{eq}, L_{10}, L_{50}, L_{90}, L_{min}, and L_{max}) were computed for each measurement location (Horse Creek 01 and New Brock Canyon). Based on the recommendations in the Ambrose study, the data was processed over 1 hour periods and averaged over the entire study period.

The ARCADIS study conducted baseline noise measurements over three, 7-day periods. All twenty-one days of measurement data were combined into the summary acoustic metric computations shown in the tables below. Wind speed, wind direction, temperature, and relative humidity meteorological data are also presented hourly within this data set for reference. As recommended in the Ambrose study, noise levels occurring during wind speeds in excess of 5 m/s (11 mph) were excluded from the data analysis calculations. Tables 2 and 3 present the results of the ambient metric calculations for the HC/CUEP baseline noise monitoring study.

Table 2. Noise Monitoring Results – Monitor 1 – Horse Creek 01

Start Date	End Date	Hour	dB(A)						Average Weather			
			L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}	Wind Direction	Wind (mph)	Temp (°F)	Humidity (%)
3/27/2014	5/8/2014	0	24.9	25.7	24.1	25.5	24.9	24.2	222.6	1.7	36.0	60.5
3/27/2014	5/8/2014	1	22.6	23.2	22.1	23.1	22.6	22.2	212.5	1.5	34.5	63.0
3/27/2014	5/8/2014	2	29.5	30.4	28.5	30.2	29.5	28.7	227.6	1.9	33.6	64.6
3/27/2014	5/8/2014	3	32.5	33.5	31.4	33.2	32.4	31.6	215.6	1.6	32.5	66.4
3/27/2014	5/8/2014	4	31.7	32.7	30.5	32.5	31.6	30.8	219.8	1.4	31.7	67.4
3/27/2014	5/8/2014	5	31.2	32.7	29.3	32.3	31.1	29.7	203.3	1.5	31.0	68.4
3/27/2014	5/8/2014	6	32.0	33.5	30.1	33.2	31.9	30.4	213.2	1.7	32.7	67.9
3/27/2014	5/8/2014	7	31.3	32.5	29.9	32.2	31.2	30.1	189.2	2.0	37.1	62.9
3/27/2014	5/8/2014	8	29.2	30.4	28.1	30.1	29.2	28.3	158.4	2.4	40.1	59.2
3/27/2014	5/8/2014	9	36.8	37.7	35.8	37.5	36.7	36.0	163.9	3.2	45.0	56.3
3/27/2014	5/8/2014	10	33.4	34.6	32.2	34.3	33.3	32.4	180.1	3.8	47.6	51.8
3/27/2014	5/8/2014	11	31.3	32.4	30.3	32.1	31.3	30.5	195.5	4.2	52.4	50.5
3/27/2014	5/8/2014	12	34.5	36.1	33.1	35.7	34.4	33.4	202.5	5.1	54.2	47.9
3/27/2014	5/8/2014	13	38.9	39.8	37.9	39.6	38.8	38.1	211.0	5.4	55.5	45.8
3/27/2014	5/8/2014	14	35.9	37.1	34.7	36.8	35.8	34.9	214.3	5.5	56.6	44.4
3/27/2014	5/8/2014	15	36.0	37.4	34.7	37.0	35.9	34.9	201.3	5.2	55.3	40.7
3/27/2014	5/8/2014	16	35.0	36.0	33.8	35.8	34.9	34.0	211.0	5.2	54.6	40.4
3/27/2014	5/8/2014	17	34.0	35.4	32.7	35.0	33.9	32.9	218.8	4.4	53.2	41.2
3/27/2014	5/8/2014	18	31.6	33.0	30.2	32.7	31.5	30.5	234.1	4.2	50.8	43.2

3/27/2014	5/8/2014	19	30.4	32.3	28.3	31.8	30.3	28.7	227.3	2.6	46.2	49.2
3/27/2014	5/8/2014	20	29.5	30.3	28.6	30.1	29.4	28.8	225.3	2.0	42.7	54.6
3/27/2014	5/8/2014	21	29.7	30.3	29.1	30.2	29.7	29.2	234.3	2.4	41.2	56.8
3/27/2014	5/8/2014	22	24.5	25.2	23.8	25.1	24.5	24.0	238.9	2.2	40.1	58.8
3/27/2014	5/8/2014	23	27.8	28.7	26.9	28.5	27.8	27.0	225.0	2.3	38.9	61.8
3/27/2014	5/8/2014	24	24.9	25.7	24.1	25.5	24.9	24.2	222.6	1.7	36.0	60.5

Table 3. Noise Monitoring Results – Monitor 2 –New Brock Canyon

Start Date	End Date	Hour	dB(A)						Average Weather			
			L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}	Wind Direction	Wind (mph)	Temp (°F)	Humidity (%)
3/27/2014	5/8/2014	0	36.3	37.4	35.1	37.2	36.2	35.3	233.0	2.3	33.1	55.1
3/27/2014	5/8/2014	1	36.5	37.6	35.3	37.4	36.5	35.5	230.7	2.4	32.4	55.4
3/27/2014	5/8/2014	2	33.2	33.9	32.4	33.7	33.1	32.5	237.8	2.9	31.4	55.9
3/27/2014	5/8/2014	3	31.8	32.7	30.7	32.5	31.7	30.9	242.1	2.6	30.7	56.4
3/27/2014	5/8/2014	4	66.4	68.8	63.4	68.1	66.3	63.8	241.2	2.9	30.4	56.5
3/27/2014	5/8/2014	5	37.2	38.5	35.6	38.2	37.1	35.9	238.6	2.9	30.3	56.5
3/27/2014	5/8/2014	6	38.4	39.6	37.1	39.3	38.4	37.4	232.5	2.3	30.6	59.2
3/27/2014	5/8/2014	7	37.7	38.9	36.2	38.6	37.6	36.5	234.1	2.2	33.6	58.5
3/27/2014	5/8/2014	8	39.1	40.2	37.9	39.9	39.0	38.1	212.7	2.2	36.6	55.5
3/27/2014	5/8/2014	9	41.1	42.4	39.7	42.1	41.0	39.9	220.3	2.7	40.7	55.1
3/27/2014	5/8/2014	10	44.4	45.9	42.7	45.6	44.3	43.0	217.5	2.8	41.3	50.6
3/27/2014	5/8/2014	11	44.9	46.4	43.1	46.1	44.8	43.6	219.1	3.2	42.3	51.1
3/27/2014	5/8/2014	12	45.2	46.3	44.0	46.1	45.2	44.3	233.1	3.2	45.4	50.2
3/27/2014	5/8/2014	13	43.7	44.9	42.4	44.6	43.5	42.6	246.3	3.4	47.8	51.0
3/27/2014	5/8/2014	14	40.9	41.8	39.8	41.6	40.8	40.0	236.0	3.1	47.4	45.9
3/27/2014	5/8/2014	15	41.4	42.5	40.3	42.2	41.4	40.5	221.4	3.5	46.9	43.9
3/27/2014	5/8/2014	16	40.2	41.1	39.3	40.9	40.2	39.4	220.9	3.8	46.2	44.0
3/27/2014	5/8/2014	17	37.9	39.1	36.6	38.9	37.8	36.9	232.3	3.7	44.9	44.6

3/27/2014	5/8/2014	18	40.0	41.0	38.9	40.8	39.9	39.1	241.8	3.3	42.7	45.1
3/27/2014	5/8/2014	19	40.1	41.1	39.1	40.9	40.1	39.3	259.8	2.7	39.2	48.9
3/27/2014	5/8/2014	20	39.7	40.4	39.0	40.3	39.7	39.1	253.9	2.8	37.4	49.7
3/27/2014	5/8/2014	21	38.0	38.7	37.3	38.5	38.0	37.5	254.3	2.4	36.3	50.1
3/27/2014	5/8/2014	22	37.5	38.1	36.8	38.0	37.5	37.0	247.6	2.4	35.7	51.4
3/27/2014	5/8/2014	23	40.3	40.9	39.6	40.8	40.3	39.7	245.7	2.1	34.3	54.3
3/27/2014	5/8/2014	24	36.3	37.4	35.1	37.2	36.2	35.3	233.0	2.3	33.1	55.1

Noise levels were generally higher at the New Brock Canyon site compared to the Horse Canyon 01 site. Average wind speeds between the two locations, however, were comparable. Figures 1 and 2 provide graphs of the data in an un-averaged format (data is plotted on 10 second intervals). As shown, there is a distinct diurnal pattern in noise sources at both lek sites that does not necessarily correspond to wind levels. Roads, mine exploration activities, grazing, and public use of the land contribute to current baseline noise levels. No human activity was noted close to the New Brock Canyon site at the times of noise equipment deployment, while near Horse Canyon 01, a drill rig laydown site was located approximately a mile west of the lek, and a county road was located approximately a quarter mile south. Grazing, particularly near New Brock Canyon site, and commercial aircraft overhead flights were also observed in these areas.

The ground surface at Horse Canyon 01 was observed to mostly consist of a soft soil composition, which is more absorptive and less reflective of noise as compared to the New Brock Canyon site, which shows an overall dense rocky ground surface. Finally, sage brush height at Horse Canyon 01 was observed to be generally taller and denser than at New Brock Canyon lek (see photographic log in ARCADIS 2014). Vegetation can reduce the impact of wind on noise levels, and cause additional noise due to wind interacting with leaves (Ambrose and Florian 2014).

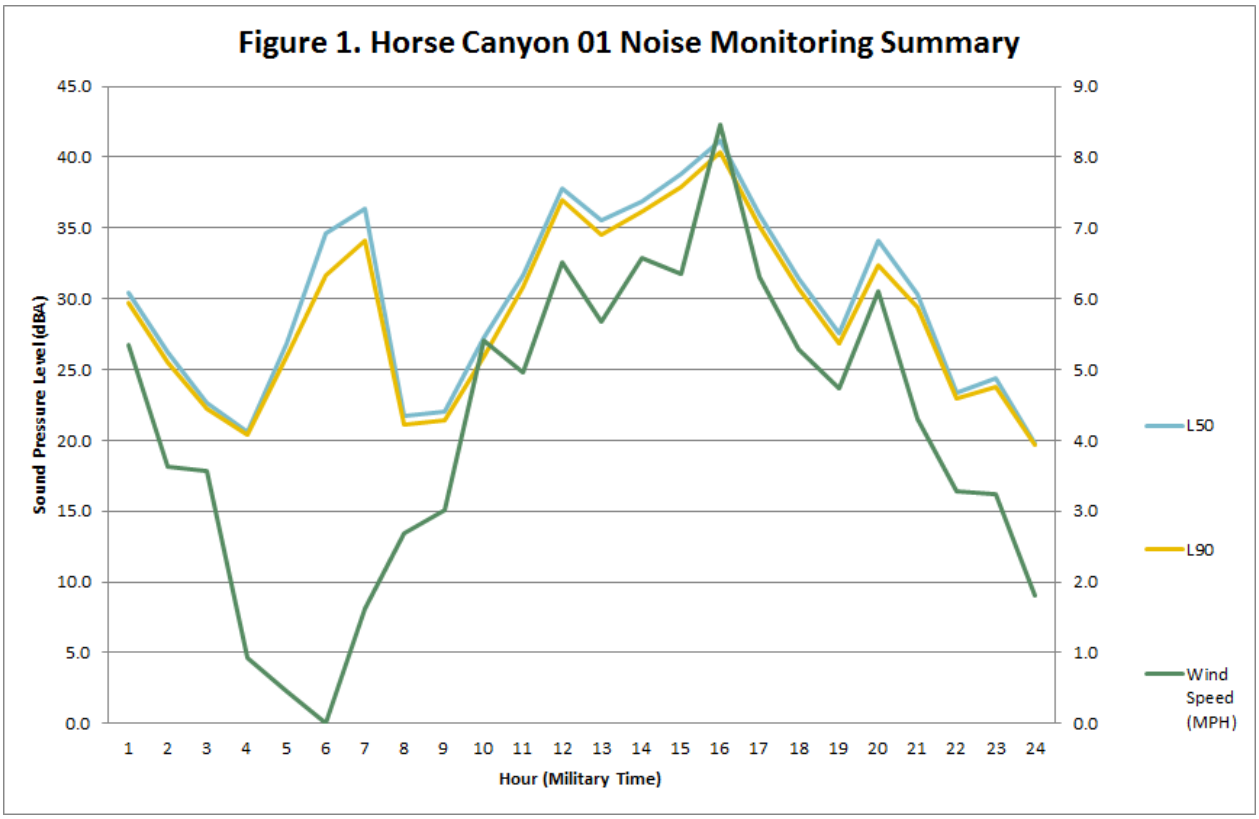
Figure 1. Horse Canyon 01 Noise Monitoring Summary
Sound Pressure Level (dBA)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour (Military Time)
L50
L90
Wind Speed (MPH)

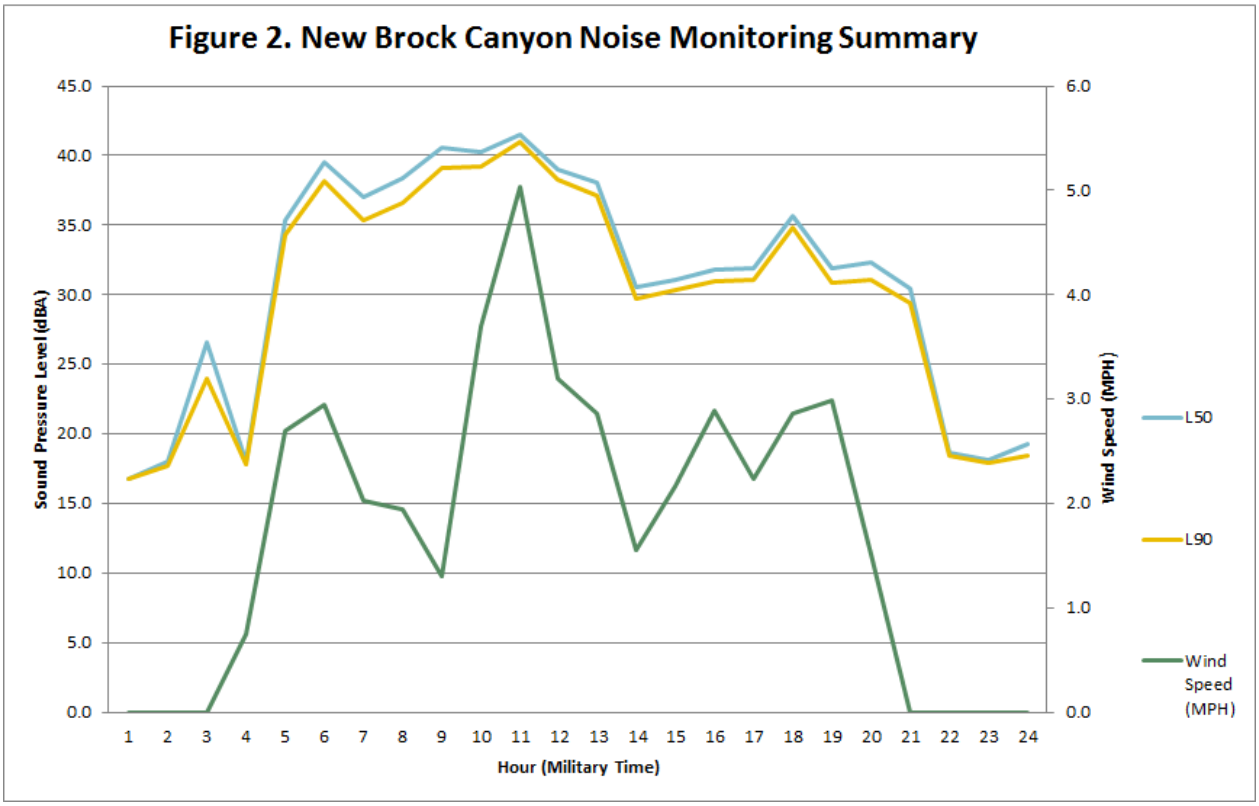
Figure 2. New Brock Canyon Noise Monitoring Summary
Sound Pressure Level (dBA)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Wind Speed (MPH)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour (Military Time)
L50
L90
Wind Speed (MPH)

Proposed Baseline Threshold

The purpose of this memorandum is to determine a baseline noise threshold for the purposes of evaluating noise impacts to nearby Greater Sage-grouse leks during breeding season from the proposed Project. Sage-grouse are sensitive to noise levels during the strutting season in the spring (March through May). Peak strutting hours are from 5:00 a.m. to 9:00 a.m. (Ambrose and Florian 2014). BLM (2014) recommends L_{90} be used for establishing an ambient threshold level. The L_{90} noise levels occurring during this time period ranged from 28.3 to 36.0 dBA at Horse Canyon 01, and 35.9 to 37.9 dBA at New Brock Canyon (Tables 4 and 5). Differences in noise levels between the two sites could be due to a combination of different environments and/or human or animal activity nearby.

Table 4. Horse Creek 01 Baseline Noise Threshold Summary[1]

Horse Creek 01	Min	Max	Linear Mean	**Baseline Noise Threshold**
L90	**28.3**	36.0	32.2	**28.3**
Wind speed (mph)	1.5	3.2	2.4	

[1] Values reflect statistics for the primary strutting period 5:00a.m. to 9:00a.m.

Table 5. New Brock Canyon Baseline Noise Threshold Summary[1]

New Brock Canyon	Min	Max	Linear Mean	**Baseline Noise Threshold**
L90	**35.9**	39.9	37.9	**35.9**
Wind speed (mph)	2.2	2.9	2.6	

[1] Values reflect statistics for the primary strutting period 5:00a.m. to 9:00a.m.

Baseline noise thresholds are proposed at 28.3 dBA L_{90} at Horse Creek 01, and 35.9 dBA L_{90} at New Brock Canyon. Individual baseline noise thresholds are proposed, one for each lek site, to reflect the different acoustical properties, and potentially different sources of noise, at each site. Noise impacts above these baseline noise thresholds due to proposed Project activities will be used to evaluate noise impacts on the active leks.

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Noxious Weed Management Plan
HC/CUEP Project Area
Eureka County, Nevada

April 2013

Prepared for:

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Introduction

Project Description

The Horse Canyon Mine is an inactive mine area which encompasses the Horse Canyon open-pit mine and the South Silicified open-pit area. Topography in the Horse Canyon Project Area is provided on the Cortez Quadrangle, USGS (1986) 7.5 minute series topographic map. The general flow direction at the Project Area is to the east and southeast, down the drainages of Horse Canyon and Willow Creek. There are three inactive open pits, four reclaimed waste rock facilities, one storage laydown yard, and two treatment systems. One treatment system is associated with Willow Creek and the other with the South Silicified waste rock facility. There are no other facilities at the Horse Canyon Mine.

The Project Area for HC/CUEP consists of approximately 1,246 acres of private lands and 20,090 acres of public lands administered by both the Bureau of Land Management (BLM) Mount Lewis Field Office and the BLM Elko District Office; the BLM has designated the Mount Lewis Field Office as the lead agency for the HC/CUEP and the Elko Field Office for the Horse Canyon Mine. Exploration activity within HC/CUEP consists of a drilling program. The authorized activities will result in disturbance from overland access, new road construction, and construction of drill pads. Existing access roads and overland access to drill sites are used wherever possible.

The WPV Project Area is along the east flank of the Cortez Mountain Range in the Horse Creek Valley area. The West Pine Valley exploration area contains approximately 33,586 acres managed by the BLM Elko Field Office and 332 acres of private land. The proposed activities will result in disturbance from overland access, new road construction, construction of drill pads, and a laydown yard.

Vegetation of Northeast Nevada including the Cortez Mountains has experienced substantial change over the past 100 years. These changes have resulted from heavy grazing by domestic livestock in combination with the advent of highly effective annual/winter opportunistic plants such as cheatgrass. Cheatgrass creates combustible cover on formerly bare ground and allows fires to carry more often and more extensively than was previously the case. This synergistically tends to encourage further spread of annual/winter opportunistic species (McAdoo et al 2007). Vegetation present in the area

consists of pinyon and juniper trees, with few shrubs in the higher elevations and sagebrush, rabbitbrush, and sparse grasses on the valley floors (Gilluly and Masursky, 1965). A range fire impacted the eastern margin of the Project Area (east side of Horse Canyon) in 1999 (ESCO 2011).

Purpose of Plan

The purpose of this plan is to prescribe methods to prevent, mitigate, and control the spread of noxious weeds during and following construction of the Project. Barrick and its contractors would be responsible for carrying this work out using the methods described in this plan. This plan is applicable to the construction and operation of the HC/CUEP Project

Goals and Objectives

The ultimate goal of procedures outlined in the document is to have minimized the spread of designated noxious weeds as a result of construction and operation of the project. More immediately, the objectives are to monitor areas within the project area that have been disturbed in the past as well as those that are newly disturbed as the project progresses to identify noxious plant species, efficiently apply control actions and to monitor the effectiveness of those actions, making changes as necessary.

Noxious Weed Management Plan

Weeds are opportunistic and many times exotic (non-indigenous) plant species that readily invade disturbed areas when superior competitors are not present. Many of these weedy plants have a long history of development in close proximity to human activities in the Old World. Some of these plants have not only developed impressive capacities to invade opened ground, but have also found it possible upon their advent into North America to compete with established native plants under certain conditions. Of these plants, those with the demonstrated and projected potential to disrupt agricultural operations and invade native plant communities have been legally designated as noxious species. Both at the Federal level (Executive Order 13112) and the State level (for example Nevada Revised Statutes 555) actions have been initiated to combat the establishment and spread of these plants.

Noxious Weed Inventory

Beginning in 2009, the project area has been examined annually and the location of populations of noxious plant species documented. As these populations have been encountered in the field, GPS coordinates have been established to allow development of a cumulative history in graphical form of weed presence.

Disturbance Categories

For purposes of management it is appropriate to separate areas of disturbance that are to be repeatedly impacted, such as roadsides from other areas where there is a one-time impact to be followed by an indefinitely long interval without further disturbance.

Category A – Redisturbance annual or more often

In these areas, typified by roadsides, routine operations of maintenance re-establish bare ground via grading and new development of weedy plants is to be expected on a continuing basis, and efforts to create and maintain desirable perennial vegetation are not practical.

Category B – Redisturbance likely but 2 –5 years away

In these areas, such as certain drill pads, further exploration activities may eventually develop and cause new disturbance but annual disruption is unlikely.

Category C – Redisturbance if any is long-term (5+ years)

In these areas no definite return is anticipated and establishment and maintenance of a competitive perennial cover of desirable species would be sought.

Existing Conditions

As of 2012, based on botanic surveys each year since 2009, it is primarily three noxious weed species are known to occur on the site. By far the most extensive is whitetop (*Cardaria draba*), followed by musk thistle (*Carduus nutans*) and Scotch thistle (*Onopordon acanthium*). Also occurring to a very limited degree are Canada thistle (*Cirsium arvense*), poison hemlock (*Conium maculatum*) and Klamath Weed (aka Spotted St Johnswort, *Hpericum perforatum*). Weed control actions undertaken by Barrick to date have addressed white top and musk thistle in the Horse Canyon area.

Weed Control Alternatives

Alternative methods of weed control to be selected from include:

- 1) Manual Removal. This alternative includes the pulling of weeds as well as mechanized removal via grading or other surficial manipulation during for example roadside maintenance.
- 2) Manual Prevention of Flowering (e.g. mowing). This is appropriate for annual / biennial species to avoid allowing them to produce seed.
- 3) Chemical Application. Use of BLM-approved chemical treatments. To date, the use of chemicals has primarily been in the form of ground-based spot spray application of 2,4-D Amine (light trucks and ATV's). It is anticipated that future treatment of weeds will likewise be ground-based from light vehicles or in some cases via backpack apparatus. (See Herbicide Application, Handling Spills, and Cleanup section below)
- 4) Development of Desirable Annual Competition. Seeding of fast-growing annual plant species into open sites may in some cases (Short term such as Category B) be an effective tool to pre-empt weed invasion. Species to be considered include wheat, triticale, regreen, and annual rye (*Lolium multiflorum*). The latter three have the advantage of being unlikely to produce seed that could spread the plants outside the treatment area. Even were they to spread, there is essentially no chance of them becoming an invasive problem themselves. As grasses, all have the advantage for this purpose of a fine diffuse root system that thoroughly dominates the shallow soil, pre-empting weed development.
- 5) Development of Desirable Perennial Competition. For sites where re-disturbance is only a long-term prospect, if ever, establishment of a perennial cover of grass to exclude weeds is desirable. Seed mixes for high and low elevation sites are included in the Plan of Operations.

Application of Weed Control Alternatives

Disturbance Category	Weed Type	Appropriate Actions	Preferred Action(s)
A	Annual/Biennial	1, 2, 3, 4	2
A	Perennial	1	3
B	Annual/Biennial	1, 2, 3, 4, 5	4, 5
B	Perennial	1, 2, 3, 4, 5	3, 5
C	Annual/Biennial	3, 4, 5	5
C	Perennial	1, 2, 3, 5	5

Monitoring of Weed Control Effectiveness

Following implementation of a weed control alternative, results will be followed through monitoring to assess effectiveness and the need for any further action.

Disturbance Category	Action	Monitoring Type	Monitoring Interval
A	1, 2, 3, 4	Qualitative, Photo	Annual
B	1, 2, 3, 4, 5	Qualitative, Photo	Biennial
C	1, 2, 3, 4, 5	Quantitative, Photo	Triennial

Monitoring of sites treated for noxious weeds may reasonably be treated by qualitative means, noting presence or absence of the subject species and taking photos from established points. Disturbance Category C lands will be monitored quantitatively as part on on-going assessment of revegetation success and as part of that the presence/ absence and abundance of noxious species if any will be determined.

Herbicide Application Handling, Spills, and Cleanup

Herbicide Application and Handling

Herbicide application will be conducted according to The Nevada Department of Agriculture requirements. Pesticide application contractors will have valid licensing and permits active before undertaking chemical weed control.

All herbicide applications will follow USEPA label instructions. Beyond those constraints, herbicide application in the field would be suspended if any of the following conditions were encountered:

- Wind speeds greater than six (6) miles per hour (MPH) if liquids are to be applied.
- Wind speeds greater than fifteen (15) MPH if granules are to be applied.
- Snow or ice covering the foliage of target weeds
- Precipitation occurring or imminent

Application equipment will be calibrated as to application rates and checked periodically to ensure proper rates of herbicide application.

Transport of herbicides for the Project will have the following constraints:

- Only herbicide amounts needed for each day's work will be brought into the areas to be sprayed.

- Transport of herbicide concentrate will be only in approved containers, and placed within a compartment equipped to allow prevention to container tips and spills. The compartment will be isolated from all other equipment and crew materials such as clothing and food.
- All mixing of concentrate to application rates of dilution will occur greater than 200 feet away from open flowing water, wetlands, or other sensitive resources.
- All herbicide transport, storage, and application equipment will be inspected daily for leaks.

Weed Control Contractors must provide Barrick Gold Exploration with full documentation of the identity and amount of herbicides used on the project site.

Herbicide Spills and Cleanup

All reasonable precaution will be taken to avoid herbicide spills. Should a spill occur, cleanup will commence immediately. Contractors must have spill kits on hand in vehicles at all times. Kits will include the following:

- Protective clothing and gloves
- Adsorptive clay or cat litter or other commercial adsorbent
- Plastic bags and bucket (with lid)
- Shovel
- Fiber Brush
- Dust pan
- Caution tape
- Highway flares (should the incident occur on an established road)
- Detergent

Although variable depending on size location and other particulars of the spill, general procedures would be as follows:

- Controlling traffic (if any)
- Clean-up team don protective clothing
- Stop leak(s)
- Contain spilled material
- Clean and remove the spilled herbicide and contaminated adsorptive material and soil
- Transport contaminated materials to an authorized disposal site.

Worker Safety and Spill Reporting

All herbicide contractors will have readily available copies of the appropriate Material Safety Data Sheets (MSDS) for the herbicides used. All herbicide spills will be reported

in accordance with applicable regulations, including reporting to Barrick Gold Exploration environmental department.

References Cited

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Additional Information can be obtained from the references below:

The Nevada Pesticide Applicator Training Guide is available on line at:
http://www.unce.unr.edu/programs/sites/pesticide/

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