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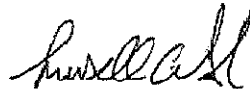
**Department of Interior (DOI)  
USGS Natural Hazards  
Transition Plan for the 1755-1780 MHz Band**

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**Certification regarding Classified and Sensitive Information:**

I, Russell Sveda, certify that this transition plan is cleared for release to the public and contains no classified or sensitive information.



07-01-2014

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DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab B: General Information

1	This Transition Plan includes pre-auction planning costs, as defined in Section O.2 of Annex O:		
	a. Total pre-auction planning costs:	\$0.000	
	b. The subtotal amount, if any, of pre-auction planning costs requested for pre-auction transfer:	\$0.000	
	c. The subtotal amount, if any, of pre-auction planning costs incurred after June 28, 2010, but before February 22, 2012:	\$0.000	
	d. This organization attests that:		
	[1] To the fullest extent possible, this transition plan provides for sharing and coordination of eligible frequencies with non-federal users, including reasonable accommodation for the use of eligible frequencies by non-federal users during the transition period.	Yes	
	[2] This transition plan provides for non-federal users to be able to use eligible frequencies during the transition period in geographic areas where this organization does not use such frequencies.	Yes	
	[3] During the transition period, this organization will make itself available for negotiation and discussion with non-federal users not later than 30 days after a written request.	Yes	
	[4] During the transition period, this organization will make available to a non-federal user with appropriate security clearances any classified information regarding the relocation process, on a need-to-know basis.	Yes	
	[5] Funds transferred before an auction likely allow for timely implementation of relocation or sharing, thereby increasing net expected auction proceeds by an amount not less than the time value of the amount of funds transferred.	Yes	
2	There is additional information required to be included in the Transition Plan that is not included in this document because it is classified information, as defined in Section O.7 of Annex O.	No	
3	There is additional information required to be included in the Transition Plan that is not included in this document because it is <u>sensitive</u> information, as defined in Section O.7 of Annex O.	No	
4	a. Name of Responsible Officer:	Russell Sveda	
	b. Office:	Office of the Chief Information Officer	
	c. Telephone Number:	303-236-5091	
	d. E-mail:	russell_sveda@ios.doi.gov	
5	Total Transition Plan Cost (\$M):	\$35.680	

DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab C: Abstract

Serial Number	Center Freq./ Lower Band Limit (MHz)	Upper Band Limit (MHz) (if appl)	Emission Bandwidth (20 dB) (MHz)	Rx IF Bandwidth (3 dB) (MHz)	Bureau	System Use	System Name	Authorized Area of Operation	TX State	TX Latitude	TX Longitude	RX State	RX Latitude	RX Longitude	Sharing/ Relocation	Alternate Frequency Assignment	Transition Timeline (Months)
I 096515	1760.0000		5	8	GG	Microwave	EHZ SEIS		CA	345257N	1175927W	CA	344415N	1173339W	Vacate NO Temp	TBD	36
I 096511	1760.0000		5	8	GG	Microwave	EHZ SEIS		CA	334743N	1173633W	CA	340810N	1180739W	Vacate NO Temp	TBD	36
I 106500	1779.0000		5	8	GG	Microwave	EHZ SEIS		CA	344415N	1173339W	CA	341357N	1171405W	Vacate NO Temp	TBD	36
I 116598	1779.0000		5	8	GG	Microwave	EHZ SEIS		CA	340810N	1180739W	CA	334743N	1173633W	Vacate NO Temp	TBD	36
I 076525	1760.0000		5	8	GG	Microwave	EHZ SEIS		CA	355700N	1205957W	CA	364537N	1212928W	Vacate NO Temp	TBD	36
I 076594	1760.0000		5	8	GG	Microwave	EHZ SEIS		CA	384552N	1225042W	CA	382054N	1223441W	Vacate NO Temp	TBD	36
I 076515	1763.0000		5	8	GG	Microwave	EHZ SEIS		CA	375527N	1223548W	CA	375302N	1221322W	Vacate NO Temp	TBD	36
I 076521	1763.0000		5	8	GG	Microwave	EHZ SEIS		CA	370649N	1215010W	CA	372720N	1221022W	Vacate NO Temp	TBD	36
I 096509	1763.0000		5	8	GG	Microwave	EHZ SEIS		CA	352337N	1202100W	CA	355207N	1202852W	Vacate NO Temp	TBD	36
I 076513	1779.0000		5	8	GG	Microwave	EHZ SEIS		CA	382054N	1223441W	CA	375527N	1223548W	Vacate NO Temp	TBD	36
I 076523	1779.0000		5	8	GG	Microwave	EHZ SEIS		CA	364537N	1212928W	CA	370649N	1215010W	Vacate NO Temp	TBD	36
I 096507	1779.0000		5	8	GG	Microwave	EHZ SEIS		CA	355207N	1202852W	CA	355700N	1205957W	Vacate NO Temp	TBD	36

DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab D: Transition Timeline

Serial Number	Geographic Location	Timeline (Months after Transition Start)			
		Temporary Sharing	Indefinite Sharing	Vacate Assignment	
I 096515	Edwards AFB,CA to Shadow Mtn, CA	No	No	36	
I 096511	Pleasants Pk,CA to Pasadena, CA	No	No	36	
I 106500	Shadow Mtn,CA to Strawberry Peak, CA	No	No	36	
I 116598	Pasadena,CA to Pleasants Pk, CA	No	No	36	
I 076525	Williams Hill, CA to Fremont Peak, CA	No	No	36	
I 076594	Geyser Peak, CA to Sonoma Mtn, CA	No	No	36	
I 076515	Mt Tamalpais, CA to Vollmer Pk, CA	No	No	36	
I 076521	Crystal Pk, CA to Menlo Park, CA	No	No	36	
I 096509	Black Mtn, CA to Hog Canyon, CA	No	No	36	
I 076513	Sonoma Mtn, CA to Mt Tamalpais, CA	No	No	36	
I 076523	Fremont Pk, CA to Crystal Pk, CA	No	No	36	
I 096507	Hog Canyon, CA to Williams Hill, CA	No	No	36	

DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab E: Plan and Timeline for using Funds (SRF)

System Name	System ID	Total Pre-Auction Costs (\$M)	Pre-Auction Transfer Requested (\$M)	Pre-Auction Costs Incurred between 6-28-2010 and 2-22-2012	Equipment-Related Costs (\$M)	Deployment-Related Costs (\$M)	Total Cost for System (\$M)	Begin Expenditure of Funds	End Expenditure of Funds	Costs Associated with Expanded Capability	Description of Expanded Capability	Explanation/ Justification
<b>USGS EHZ SEIS Microwave System</b>	USGS1	0.000	0.000	0.000	10.616	18.052	<b>\$ 28.668</b>	1	48	0	Not Applicable	Not Applicable
<b>USGS Spectrum Relocation Program Office</b>	USGS2	0.000	0.000	0.000	0.000	7.012	<b>\$ 7.012</b>	1	72	0	Not Applicable	Not Applicable

DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab F: NTIA Interactions

<b>Interaction required with NTIA to implement this Transition Plan</b>	
1	Alternate frequency assignments will be needed for all eligible assignments listed herein (and their paired duplex channels)
2	Alternate frequency assignments may need Tx power waivers to reach needed system reliability. (mid 2014)
3	Alternate frequency assignments will be needed for additional stations as described in Tab I and for frequency diversity to reach needed system reliability.
4	Temporary assignments will be needed in the 1780-1850 MHz Band for sites that are selected for "Fast Track" implementation. (2015)

DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab G: Identification of Excluded Classified and Sensitive Information

<b>Serial Number</b>	<b>Description of Classified or Sensitive Information</b>	<b>Reason for Exclusion</b>	<b>Reference</b>
	None		

DOI USGS CA Seismic Network Transition Plan for 1755-1780 MHz Band

Tab H: Factors that could Impact Fulfillment of Transition Plan

	<b>Factor</b>	<b>Impact on Fulfillment of Transition Plan</b>
1	Jurisdictional approval of new towers and radio sites	Approval processes for construction, leases, permits and other requirements often have indeterminate timeframes when can lead to schedule delays.
2	Inability to obtain temporary frequencies in the 1780 - 1850 MHz band	Unable to "Fast Track" vacating the 1755-1780 MHz making that spectrum available while the USGS transitions to the 8GHz band.



Executive Summary

As part of the FCC spectrum auction in the fall of 2014, the USGS Seismic Network in California will be required to vacate 12 Radio Frequency Authorizations used in microwave point to point radio links. These radio links are used 24x7x365 to collect real-time life and safety information from hundreds of earthquake sensors in California and the west coast. This network serves the emergency response community, national, state, and local governments, and the public by providing critical real-time information on earthquake locations and magnitudes, ShakeMaps, shaking performance of engineered structures, and data for the California Earthquake Early Warning System. Reliability, security, low maintenance costs, data integrity and environmental/hazard/earthquake resiliency are mission critical requirements of this system.

Complete studies on the impact of transitioning to other frequency bands have not been completed, and no funding or time is available to do so before the required submission of this Transition Plan. Cost estimates will be refined after additional engineering studies are completed upon preauction funding transfer.

Notes for Tab C, column R; Tab D, columns E & F; and Tab E, columns H & J.

The attached Transition Plan assumes that the affected links will be relocated to the 8GHz Band to avoid moving to other planned auction frequency bands, although alternative compatible technical/cost/schedule solutions may be employed as technology allows. As the system is transitioned, additional links will be required, additional equipment will be required, and the potential for interference at 8 GHz is possible. Incremental improvements to the current system design may be undertaken to insure industry standard microwave reliability, security, data integrity and resiliency with low out-year maintenance costs.

Regulatory requirements (permits and modifications to current regulation) will be addressed. IT and data management systems will be modified to accommodate changes to the system.

The USGS could vacate the affected frequencies more quickly ("Fast Track") than planned under the transition to 8GHz by replacing frequency pairs scheduled for auction with temporary frequency pairs in the 1780-1850 MHz band. This would require NTIA to assign new temporary RFAs in this band, re-crystal existing radios, and site visits to each of the impacted microwave sites. Costs for a "Fast Track" approach are not included in this plan due to significant cost increase with moderate schedule acceleration.

Tab I: Additional Information

An additional 18 frequency links listed below in the upper band (1780-1850 MHz) must also be transitioned to relocate the entire system. These links, together with those in the 1755-1780 band, comprise a single communications system transporting earthquake data. A single system that operated duplex links in both the 1755-1780 and 8GHz bandwidth with different hardware and software would be exceedingly complicated to operate and likely compromise the integrity of the system.

**Additional assignments needed outside of eligible frequencies**

Serial #	System Name	Location	Paired Serial #	Frequency (MHz)
I 096515	EHZ SEIS	Edwards AFB,CA to Shadow Mtn, CA	I 096514	1815
I 096511	EHZ SEIS	Pleasants Pk,CA to Pasadena, CA	I 096510	1815
I 106500	EHZ SEIS	Shadow Mtn,CA to Strawberry Peak, CA	I 106501	1830
I 116598	EHZ SEIS	Pasadena,CA to Pleasants Pk, CA	I 116599	1830
I 076525	EHZ SEIS	Williams Hill, CA to Fremont Peak, CA	I 076524	1810
I 076594	EHZ SEIS	Geyser Peak, CA to Sonoma Mtn, CA	I 076512	1810
I 076515	EHZ SEIS	Mt Tamalpais, CA to Vollmer Pk, CA	I 076516	1815
I 076521	EHZ SEIS	Crystal Pk, CA to Menlo Park, CA	I 076520	1815
I 096509	EHZ SEIS	Black Mtn, CA to Hog Canyon, CA	I 096508	1815
I 076513	EHZ SEIS	Sonoma Mtn, CA to Mt Tamalpais, CA	I 076514	1830
I 076523	EHZ SEIS	Fremont Pk, CA to Crystal Pk, CA	I 076522	1830
I 096507	EHZ SEIS	Hog Canyon, CA to Williams Hill, CA	I 096506	1830
I 076518	EHZ SEIS	Vollmer Pk to Menlo Park,CA	I 076519	1794
I 076519	EHZ SEIS	Menlo Park to Vollmer Pk,CA	I 076518	1847
I 096512	EHZ SEIS	Pleasants Pk to Strawberry Pk, CA	I 096513	1794
I 096513	EHZ SEIS	Strawberry Pk to Pleasants Pk, CA	I 096512	1847
I 106601	EHZ SEIS	Williams Hill to Fremont Pk, CA	I 106602	1847
I 106602	EHZ SEIS	Fremont Pk to Williams Hill, CA	I 106601	1810

**Notes on Bandwidth specifications (Tab C)**

1. Emission Bandwidth (col D) is derived from the emission designator: 5M00G7W (128 TCM digital modulation).
2. Rx IF Bandwidth (col E) is estimated from 8dB adjacent channel rejection specification.