



**MINNESOTA  
PUBLIC SAFETY MOBILE RADIO  
VHF INTEROPERABLE  
FREQUENCY PLAN**  
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**DRAFT FINAL**

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## Executive Summary

The Statewide Radio Board, operating as the State Interoperability Executive Committee (SIEC), is responsible for developing guidelines and standards as well as coordinating the use of interoperability frequencies in all frequency bands assigned to public safety users in Minnesota. The primary system for providing public safety radio interoperability in Minnesota is the Allied Radio Matrix for Emergency Response (ARMER). ARMER is a 700/800 MHz, trunked, Project 25 (P25) standards-based shared radio system offering the highest level of interoperability to state, local, and regional agencies that join ARMER. Outside of 700/800 MHz, public safety entities in the state primarily use Very High Frequency (VHF) frequencies in the 150-174 MHz band. In recognition of this, the SRB previously approved a modified interoperability plan to utilize the ARMER backbone to support additional interoperability infrastructure on VHF channels.

In support of that action, the Minnesota Department of Public Safety (DPS) contracted Federal Engineering (**FE**) to provide technical and professional assistance in the development of a VHF Interoperable Frequency Plan (Frequency Plan). The Frequency Plan includes significant input from public safety agencies, primarily gathered during meetings with the Statewide VHF Interoperable Frequency Steering Committee (Steering Committee) as well as stakeholder review and input on draft versions of the Frequency Plan. Additionally, **FE** reviewed similar plans from other states, national interoperability standards and guidelines, existing interoperability channels used in the state as well as federal rules and regulations concerning interoperability channels.

In conjunction with the Steering Committee, **FE** developed six recommendations for implementing the Frequency Plan.

1. Establish a standard recommended VHF interoperability zone for all VHF public safety radio users in the state and adopt standard naming conventions and operating modes for all such channels.
2. Narrowband the current primary statewide VHF interoperability wideband channels<sup>1</sup> by the federally mandated deadline and adopt standard naming conventions and operating modes for these channels.

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<sup>1</sup> MINSEF (155.475), SWFIREMA (154.295), EMS HEAR (155.340) and MIMS (155.370)



3. License the national VCALL10 and VTAC11-14 channels and the primary statewide VHF interoperability channels on a statewide basis and establish statewide calling channels for public safety interoperability.
4. Incorporate the VCALL/VTAC channels and the primary VHF interoperability channels into the ARMER VHF interoperability infrastructure.
5. Develop a letter of authorization or memorandum of understanding establishing permissions and guidelines for use of all statewide interoperability channels by authorized agencies.
6. Update or revise existing state radio standards as needed to ensure compliance with the VHF Interoperable Frequency Plan and national standards for public safety interoperability channels wherever possible.

The standard recommended VHF interoperability zone for all VHF public safety radio users in the state should include the following channels.

**Table 1 - Statewide VHF Interoperability Zone**

Mode #	STD NAME	SHORT NAME <sup>2</sup>	Mobile TX Freq	CTCSS or NAC	Mobile RX Freq	Original Name
1	VCALL10	VCAL10	155.7525	156.7	155.7525	
2	VTAC11	VTAC11	151.1375	156.7	151.1375	
3	VTAC12	VTAC12	154.4525	156.7	154.4525	
4	VTAC13	VTAC13	158.7375	156.7	158.7375	
5	VTAC14	VTAC14	159.4725	156.7	159.4725	
6	MNCOMM	MNCOMM	155.3700	156.7	155.3700	MIMS
7	VFIRE23	VFIR23	154.2950	156.7	154.2950	SWFIREMA
8	MNFIRG2	MNFG2	154.0100	156.7	154.0100	
9	MNFIRG3	MNFG3	153.8300	156.7	153.8300	
10	DNRTAC1	DNRT1	151.4750	CSQ	151.4750	
11	VLAW31	VLAW31	155.4750	156.7	155.4750	MINSEF
12	VMED28	VMED28	155.3400	156.7	155.3400	EMS HEAR
13	IR 2	IR 2	165.9625	167.9	170.4125	
14	VTAC14R	TAC14R	154.6875	156.7	159.4725	
15	NGRPTR*	NGRPTR	Restricted	Restricted	Restricted	
16	LE 2*	LE 2	Restricted	Restricted	Restricted	

<sup>2</sup> For use with limited character display radios

\* Local option channel if not implemented with LOA or MOU for use of federal channels.



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## 1. Introduction

The primary system for providing public safety radio interoperability in Minnesota is the Allied Radio Matrix for Emergency Response (ARMER). ARMER is a 700/800 MHz, trunked, Project 25 (P25) standards-based shared radio system offering the highest level of interoperability to state, local, and regional agencies in Minnesota that join ARMER. Recognizing that not all local or regional radio users will join ARMER, in January 2010 the SRB approved a modified interoperability plan to utilize the ARMER backbone to support additional interoperability infrastructure in the Very High Frequency (VHF) band that includes channels in the 150 to 174 MHz frequency range. Outside of 700/800 MHz, VHF is the most widely used frequency band by public safety entities in the state.

To the extent permitted by federal laws and regulations, the SRB, operating as the State Interoperability Executive Committee or SIEC, is responsible for developing guidelines and standards for the use of interoperability frequencies in all frequency bands assigned to public safety users in Minnesota. Given the widespread use of VHF frequencies in the state, the Minnesota Department of Public Safety (DPS) contracted Federal Engineering (**FE**) to provide technical and professional assistance in the development of a VHF Interoperable Frequency Plan (Frequency Plan). The Frequency Plan provides guidance for the use of VHF interoperable frequencies by public safety agencies operating in Minnesota during local, regional, and statewide emergency responses.

While the primary focus of the Frequency Plan is to identify and establish guidance for the use of VHF interoperable frequencies in Minnesota subsequent to the FCC narrowbanding mandate of January 1, 2013, unique operational challenges inherent in the transition of existing wide band (25 kHz) interoperability frequencies to narrow band operations (12.5 kHz) are also identified. Additionally, the Frequency Plan outlines, where possible, the use of various VHF interoperability frequencies in neighboring states. Given the extremely limited use of frequencies in the Ultra High Frequency (UHF) band (frequencies in the 450-470 MHz range), the Frequency Plan does not address interoperable communications in this band.

Since the Frequency Plan incorporates the practical and operational use of existing and new VHF interoperability resources, public safety agencies were extensively involved with the plan development, primarily through meetings with the Statewide VHF Interoperable Frequency Steering Committee (Steering Committee), review of the draft Frequency Plan by interested stakeholders and a final review of the Frequency Plan by the SRB.



## 2. Minnesota VHF Interoperable Frequency Plan Development

*FE* developed the Minnesota VHF Interoperable Frequency Plan through a defined process that included the following steps:

1. Review of the findings and results of the previously completed VHF/UHF Frequency Planning Study, VHF/UHF Interoperability Infrastructure Planning Study, and changes to the ARMER interoperability plan approved by the SRB on January 28, 2010.
2. Review of the statewide interoperable frequency plans from Texas, Wisconsin, and Kansas.
3. Identified Federal and non-Federal VHF national interoperability frequencies as well as existing standards and standard operating procedures related to the use of those frequencies provided by the Federal government agencies, public safety standards bodies, and existing radio communication rules and regulations.
4. Identified VHF interoperability frequencies incorporated within the interoperable frequency plans of adjacent states.
5. Review of the proposed Frequency Plan structure and content with the Steering Committee.
6. Surveyed the Steering Committee members for frequencies suitable for inclusion in the Frequency Plan and recommended for use in a common statewide interoperability zone for VHF public safety users.
7. Developed and reviewed the DRAFT Frequency Plan with Steering Committee members.
8. Incorporated feedback from the Steering Committee members into the DRAFT Final Frequency Plan for subsequent review by a broader group of stakeholders.
9. Incorporated comments and adjustments from this broader group of stakeholders then prepared the Final VHF Interoperable Frequency Plan for presentation to the SRB.



### 3. Non-Federal VHF National Interoperability Channels

In an order<sup>3</sup>, released October 10, 2000, the Federal Communications Commission (FCC) established nationwide public safety interoperability channels in multiple frequency bands including five narrowband channels in the VHF public safety spectrum. The FCC designated one of the five channels as a calling channel and the four remaining channels as tactical channels.

Existing use of these channels and immediately adjacent channels by incumbent licensees led the FCC to defer primary use of these channels for national interoperability purposes until January 2005. After that date, incumbent licensees are allowed to utilize these channels on a secondary, non-interfering basis to interoperability uses.

The order went on to stipulate that a public safety entity must have a license to operate a base or control station on these VHF interoperability channels. However, public safety licensees who are eligible to or already hold a radio license under FCC Part 90 rules can operate mobile units on the national interoperability channels without an individual license.

Inclusion of the non-Federal VHF national interoperability channels in state, local, and regional communications plans has increased over the last few years and these channels are also incorporated in the National Interoperability Field Operations Guide<sup>4</sup> (NIFOG) published by the U.S. Department of Homeland Security's Office of Emergency Communications. The NIFOG provides a technical reference for radio communications during disasters and emergencies including a list of frequencies often used during incidents where radio interoperability is required.

Standardized channel names and programming parameters for these channels are also included in the recently established American National Standards Institute (ANSI) standards document, "APCO/NPSTC ANS 1.104.1-2010, Standard Channel Nomenclature for Public Safety Interoperability Channels."<sup>5</sup> Table 1 lists the standard names, frequencies and Continuous Tone Coded Squelch Systems (CTCSS) utilized for the non-federal VHF national interoperability channels.

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<sup>3</sup> [http://fjallfoss.fcc.gov/edocs\\_public/attachmatch/FCC-00-348A1.pdf](http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-00-348A1.pdf)

<sup>4</sup> <http://www.safecomprogram.gov/SAFECOM/nifog/>

<sup>5</sup> <http://www.apco911.org/new/commcenter911/documents/APCO-NPSTC-ANS1-104-1web.pdf>



**Table 1 – Non-Federal VHF National Interoperability Channels**

ANSI Standard Name	Mobile TX Freq.	TX/RX CTCSS	Mobile RX Freq.	Use
VCALL10	155.7525	156.7/CSQ	155.7525	Public safety calling
VTAC11	151.1375	156.7/CSQ	151.1375	Public safety tactical
VTAC12	154.4525	156.7/CSQ	154.4525	Public safety tactical
VTAC13	158.7375	156.7/CSQ	158.7375	Public safety tactical
VTAC14	159.4725	156.7/CSQ	159.4725	Public safety tactical

VCALL10 is a dedicated interoperability-calling channel while the VTAC channels are reserved for interagency communications and primarily incident-based operations. The standard mode of operation for the VCALL and VTAC channels is analog narrowband. All fixed, mobile, and portable radios should transmit using the 156.7 Hz CTCSS code. All mobile and portable radios should be set for carrier squelch unless CTCSS is necessary to mitigate interference. A Network Access Code (NAC) of \$293 should be used instead of the standard CTCSS codes in cases where digital operation is also permitted on the national interoperability channels in regional or statewide interoperability plans.





#### 4. Federal VHF National Interoperability Frequencies

As noted in FCC Public Notice DA 01-1621<sup>6</sup> released on July 13, 2001, the National Telecommunications and Information Administration (NTIA) has specified forty Federal Government channels (20 channels each in the federal VHF and UHF bands) for use by non-Federal public safety entities to communicate with Federal Government agencies. As set forth in Section 4.3.16 of the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management<sup>7</sup>, “these channels are available to non-federal entities to enable joint federal/non-federal operations for law enforcement and incident response, subject to the condition that harmful interference will not be caused to federal stations. These channels are restricted to interoperability communications and are not authorized for routine or administrative uses.” These channels are also restricted solely to narrowband operation and are not always available at all locations.

Non-Federal public safety entities must obtain a license from the FCC to use these frequencies and the license applications must include written certification from a Federal Government agency approving use of the requested frequency or frequencies. Non-Federal public safety entities must also provide a copy of said license to the Federal Government agency or agencies with which communications interoperability is required.

Provisions for the use of the Federal VHF national interoperability channels in state, local, and regional communications plans are not as widespread as the non-Federal VHF interoperability channels, however the Federal channels are also incorporated in the NIFOG and the ANSI standard for public safety interoperability channels. Tables 2 and 3 list the standard names, frequencies and CTCSS/NAC codes utilized for the Federal VHF national interoperability channels used in Federal incident response and law enforcement communications respectively.

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<sup>6</sup> [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DA-01-1621A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-01-1621A1.pdf)

<sup>7</sup> <http://www.ntia.doc.gov/osmhome/redbook/redbook.html>



**Table 2 - VHF Federal Incident Response Interoperability Channels**

ANSI Standard Name	Mobile TX Freq.	TX/RX CTCSS	Mobile RX Freq.	Use
NC 1CALL	164.7125	167.9/CSQ	169.5375	Incident Calling
IR 1	165.2500	167.9/CSQ	170.0125	Incident Tactical
IR 2	165.9625	167.9/CSQ	170.4125	Incident Tactical
IR 3	166.5750	167.9/CSQ	170.6875	Incident Tactical
IR 4	167.3250	167.9/CSQ	173.0375	Incident Tactical
IR 5	169.5375	167.9/CSQ	169.5375	Incident Calling (Direct)
IR 6	170.0125	167.9/CSQ	170.0125	Incident Tactical (Direct)
IR 7	170.4125	167.9/CSQ	170.4125	Incident Tactical (Direct)
IR 8	170.6875	167.9/CSQ	170.6875	Incident Tactical (Direct)
IR 9	173.0375	167.9/CSQ	173.0375	Incident Tactical (Direct)

**Table 3 - VHF Federal Law Enforcement Interoperability Channels**

ANSI Standard Name	Mobile TX Freq.	TX/RX CTCSS or NAC Code	Mobile RX Freq.	Use
LE A	167.0875	167.9/CSQ	167.0875	LE calling direct
LE 1	162.0875	167.9/CSQ	167.0875	LE Tactical
LE 2	162.2625	\$68F	167.2500	LE Tactical
LE 3	162.8375	\$68F	167.7500	LE Tactical
LE 4	163.2875	\$68F	168.1125	LE Tactical
LE 5	163.4250	\$68F	168.4625	LE Tactical
LE 6	167.2500	\$68F	167.2500	LE Tactical (Direct)
LE 7	167.7500	\$68F	167.7500	LE Tactical (Direct)
LE 8	168.1125	\$68F	168.1125	LE Tactical (Direct)
LE 9	168.4625	\$68F	168.4625	LE Tactical (Direct)

The standard mode of operation for the Federal incident response (IR) channels is analog narrowband. All fixed, mobile, and portable radios should transmit using the 167.9 Hz CTCSS code. All mobile and portable radios should be set for carrier squelch unless CTCSS is necessary to mitigate interference.

The standard mode of operation for the Federal law enforcement (LE) channels is analog narrowband for the LE A and LE 1 channels and Project 25 (P25) digital narrowband for all other LE channels. All fixed, mobile, and portable radios on LE A or LE 1 should transmit using the 167.9 Hz CTCSS code. All fixed, mobile, and portable radios on the remaining LE channels should use the \$68F digital network access code.



## 5. Current Minnesota Statewide VHF Interoperability Channels

Prior to the ARMER system implementation, VHF was the primary band of operation for most public safety entities in Minnesota and remains in use throughout the state. Therefore, existing VHF interoperability frequencies continue to be widely used in interoperability or mutual aid plans. Similarly, these existing channels continue to be utilized primarily along discipline specific lines, e.g. Law Enforcement, Fire, and Emergency Medical Services (EMS). These existing VHF statewide interoperability channels, as well additionally proposed VHF channels, are described in the following sections.

### 5.1 VHF Law Enforcement Interoperability Channel

The primary channel for interagency law enforcement communications in the state is 155.475 MHz, commonly referred to in Minnesota as MINSEF. Under FCC rules, “this frequency is available nationwide for use in police emergency communications networks operated under statewide law enforcement emergency communications plans.” The use of this channel is widespread in Minnesota and has been authorized for utilization by local, regional, and state authorities for fixed, mobile, and portable radios. Permission for use of this channel outside the law enforcement discipline, from the SRB and previous authorities, has been granted where an agency or entity has presented a compelling need to communicate directly with law enforcement officials. The current standard operational mode for this channel is wideband analog (25 kHz) but this channel is subject to the FCC mandated narrowbanding (12.5 kHz) deadline of January 1, 2013. As a channel authorized by the FCC for similar uses across the nation, this channel is also included in the NIFOG and the ANSI standard for public safety interoperability channels and is designated in those plans as VLAW31.

An additional channel (155.370 MHz), originally designated in the Police service by the FCC, is commonly referred to as MIMS in Minnesota and has become more commonly used as an incident management channel in the state. MIMS is also used for point-to-point communications between public safety dispatch centers, although the deployment of ARMER radios to all public safety answering points that are not ARMER participants is likely to supplant that use. The use of MIMS is widespread in Minnesota and has been authorized for utilization by local, regional, and state authorities for fixed, mobile, and portable radios. The current standard operational mode for this channel is wideband analog (25 kHz) but this channel is subject to the FCC mandated narrowbanding (12.5 kHz) deadline of January 1, 2013. This channel is not included in the NIFOG and the ANSI standard for public safety interoperability channels but would



be widely available for use in the state. Table 4 lists the VHF law enforcement channels available for statewide interoperability.

**Table 4 – Current Minnesota Law Enforcement Interoperability Channels**

Current Name	ANSI Standard Name	Frequency	Notes
MINSEF	VLAW31	155.475	ANSI Std. CTCSS Code is 156.7
MIMS	NA	155.370	Currently used for Incident Mgmt.

## 5.2 VHF Fire Interoperability Channels

The primary channel for interagency Fire communications in the state is 154.295 MHz, commonly referred to in Minnesota as FIRESWMA. Under FCC rules, this frequency is reserved for assignment to stations in the Fire service and was developed as a statewide mutual aid channel under the Minnesota Fire Frequency Utilization Plan developed in 1982. The use of this channel is widespread in Minnesota and has been authorized for use by local, regional, and state authorities for fixed, mobile, and portable radios. Permission to utilize this channel outside the Fire discipline, from the SRB and previous authorities, has been granted where an agency or entity has presented a compelling need to communicate directly with Fire officials such authorizations primarily going to the Minnesota Department of Natural Resources (MN DNR) and EMS agencies. The current standard operational mode for this channel is wideband analog but this channel is also subject to the FCC mandated narrowbanding deadline. As a channel authorized by the FCC for similar uses across the nation, this channel is also included in the NIFOG and the ANSI standard for public safety interoperability channels and is designated in those plans as VFIRE23.

Given the nature of the Fire service, numerous other interoperability channels have been implemented in the state over the years. These channels and the guidelines for their use are included in the Minnesota Fire Frequency Utilization Plan and other formal documents, such as memorandums of understanding (MOUs) and letters of authorization (LOAs), between agencies in the Fire service or those providing supporting services or managing forestry resources such as the Minnesota Department of Natural Resources (MN DNR). A summary of the channels currently available on a statewide basis for interoperability in the Fire service is shown in Table 5.



**Table 5 – Current Minnesota Fire Interoperability Channels**

Current Name	ANSI or MN Standard Name	Frequency	Notes
FIRESWMA	VFIRE23	154.295	ANSI Std. CTCSS Code is 156.7
FIRE TAC 1	MNFIRG3	153.830	Tactical only
FIRESWMA 2	MNFIRG2	154.010	Tactical only <sup>8</sup>
DNR TAC1	DNRTAC1	151.475	Use must be approved by MN DNR
DNR STWD	NA	151.415	Use must be approved by MN DNR

The current standard operational mode for the channels shown above is wideband analog but all are subject to the FCC mandated narrowbanding deadline of January 2013.

Two other Fire channels, VFIRE21 (154.2800 MHz) and VFIRE22 (154.2650 MHz), which are included in the NIFOG and the ANSI standard, are designated in the Minnesota Fire Frequency Utilization Plan as Fire Frequency 69 and 70 respectively. In the Minnesota plan, these channels are allocated on a county-by-county basis with different CTCSS codes. The deployment of these channels in the state is therefore inconsistent with the national standard and limits the use of these channels for statewide interoperability and for interoperability with adjacent states and regions that may use these channels as defined in the ANSI standard (CTCSS Code of 156.7 Hz).

### **5.3 VHF EMS Interoperability Channels**

The primary channel for interagency EMS communications in the state is 155.340 MHz, commonly referred to in Minnesota as EMS HEAR. Under FCC rules, “this frequency may be designated by common consent as an intersystem mutual assistance frequency under an area-wide medical communications plan” and was developed as a statewide mutual aid channel under the Minnesota EMS Radio Communications Plan published in 2007. The use of this channel is widespread in Minnesota and has been authorized for use by local, regional, and state authorities for fixed, mobile, and portable radios. Permission to utilize this channel outside the EMS discipline or hospitals, from the SRB and previous authorities, has been limited. The current standard operational mode for this channel is wideband analog but this channel is subject to the FCC mandated narrowbanding deadline. As a channel authorized by the FCC for similar uses across the nation, this channel is included in the NIFOG and the ANSI standard for public safety interoperability channels and is designated in those plans as VMED28. In the

<sup>8</sup> Not widely licensed in the state at this time.



Minnesota EMS plan, this channel is specified for use with a CTCSS code (210.7) different from the national standard (156.7). This would limit the use of this channel for statewide interoperability with other users from adjacent states and regions that currently utilize or plan to migrate to the national standard CTCSS code.

An additional statewide EMS tactical channel, 150.7750 MHz, appears in the Minnesota EMS Radio Communications Plan although the channel does not appear to be widely used based on a search of the FCC licenses in the state. Steering Committee members also report that this frequency is used in some counties as a primary operations channel. This channel will also be subject to the FCC mandated narrowbanding deadline.

A summary of the current EMS interoperability channels available for statewide use is shown in Table 6.

**Table 6 – Current Minnesota EMS Interoperability Channels**

Current Name	ANSI Standard Name	Frequency	Notes
EMS HEAR	VMED28	155.340	ANSI Std. CTCSS Code is 156.7
EMS TACTICAL	NA	150.775 <sup>9</sup>	Tactical but also primary in some counties

#### **5.4 Federal VHF Interoperability Channels**

As noted earlier in the report the NTIA has specified 20 VHF Federal Government channels for use by non-Federal public safety entities to communicate with Federal Government agencies. These channels are available to non-federal entities to enable joint federal/non-federal operations, are restricted to interoperability communications only and are not authorized for routine use. The only Federal VHF incident response and law enforcement channels listed in Section 4 that have been cleared for use statewide are LE 2 and IR 2.

All non-Federal public safety entities must obtain a license from the FCC to use these frequencies and the license applications must include written certification from a Federal Government agency approving use of the requested frequency or frequencies.

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<sup>9</sup> Not widely licensed in the state and not available statewide due to local use



### 5.5 Deployable Temporary VHF Interoperability Channels

As outlined in the Minnesota Statewide Communications Plan (SCIP), the State is working towards developing, implementing and maintaining deployable interoperable communications assets as part of a Strategic Technology Reserve (STR). STR assets would be deployed during emergencies or disasters. The Minnesota National Guard has also authorized the inclusion of one VHF temporary repeater channel into authorized public safety radios pending finalization of a memorandum of understanding governing use of the channel. Temporary deployable repeaters are being planned for the channels shown in Table 7.

**Table 7 – Deployable Temporary VHF interoperability channels**

ANSI Standard Name	Mobile TX Freq.	TX/RX CTCSS	Mobile RX Freq.	Use
IR 2	165.9625	167.9/CSQ	170.4125	Incident Tactical
LE 2	162.2625	\$68F	167.2500	LE Tactical
VTAC14R <sup>10</sup>	154.6875	156.7/CSQ	159.4725	STR Temporary Repeater
NGRPTR	Restricted	Restricted	Restricted	National Guard Temp. Repeater

VTAC14R is created by pairing VTAC14 with another channel licensed by the state to create a deployable repeater pair. Adding the R designation to this channel is consistent with the naming guidelines established in the ANSI standard although this is not a standard, national channel configuration.

### 5.6 VHF Interoperability Channel Use in Adjacent States

VHF frequencies are widely used in the adjacent states of North Dakota, South Dakota, Wisconsin, and Iowa. Each of these states interoperability plans includes some provisions for use of the national VCALL and VTAC channels and all of the current primary VHF interoperability channels used in Minnesota. The one exception is MIMS (155.370MHz) which is not widely licensed or used in South Dakota. A listing of the Minnesota statewide VHF interoperability channels and a brief description of their use in adjacent states can be found in Appendix C.

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<sup>10</sup> Consistent with ANSI naming conventions but not an ANSI standard channel.



## 6. Minnesota VHF Interoperable Frequency Plan Implementation

Based on our review of the existing interoperability plans in Minnesota and other states, the applicable rules, regulations, and standards for VHF interoperability channels, communications and interaction with the Statewide VHF Interoperable Frequency Steering Committee and other plan stakeholders, **FE** proposes that the following steps be taken to implement a VHF Interoperable Frequency Plan in Minnesota.

1. Establish a standard recommended VHF interoperability zone for all VHF public safety radio users in the state and adopt standard naming conventions and operating modes for all such channels in manner consistent with the current ANSI standard for public safety interoperability channels for use after the narrowband transition.
2. Narrowband the current primary statewide VHF interoperability wideband channels<sup>11</sup> by the FCC mandated deadline and adopt standard naming conventions and operating modes for these channels in manner consistent with the current ANSI standard for public safety interoperability channels.
3. License the national VCALL10 and VTAC11-14 channels and the primary statewide VHF interoperability channels on a statewide basis and establish statewide calling channels for public safety interoperability purposes.
4. Incorporate the VCALL/VTAC channels and the primary VHF interoperability channels into the ARMER VHF interoperability infrastructure.
5. Develop a letter of authorization or memorandum of understanding establishing permissions and guidelines for use of all statewide interoperability channels by authorized agencies.
6. Update or revise existing state radio standards as needed to ensure compliance with the VHF Interoperable Frequency Plan and the ANSI standard for public safety interoperability channels wherever possible.

### 6.1 Statewide VHF Interoperability Zone

**FE** discussed and reviewed potential statewide VHF interoperability channels with Steering Committee. The Steering Committee members were surveyed for frequencies suitable for inclusion in this Frequency Plan and to recommend frequencies for inclusion in a common statewide interoperability zone for VHF public safety users. The Steering Committee members were able to select up to 16 channels from a list of over

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<sup>11</sup> MINSEF (155.475), SWFIREMA (154.295), EMS HEAR (155.340) and MIMS (155.370)





49 potential interoperability channels and to submit other channels of their own choosing.

The Steering Committee members selected the VCALL and VTAC channels and the current primary VHF interoperability channels for inclusion in the common statewide interoperability zone. During the review process, the Steering Committee also determined that the legacy uses of the current primary VHF interoperability channels would continue and should be maintained. In other words, VHF law enforcement agencies will continue to use VLAW31 (MINSEF) for interagency law enforcement coordination and tactical operations, VHF Fire service agencies will continue to use VFIRE23 (SWFIREMA) for mutual aid and EMS agencies will continue to use VMED28 (EMS HEAR) for statewide medical coordination. The Steering Committee members also suggested that inter-discipline interoperability could be enhanced by allowing all public safety disciplines authority to access the current primary VHF interoperability channels rather than limiting access to specific public safety discipline.

**FE** concurs with this assessment and recommends that eligibility to access the Minnesota VHF statewide interoperability channels included in this Frequency Plan should be expanded to Public Safety Pool users, as defined in Part 90 of the FCC Rules (47CFR subpart B paragraph 90.20) which includes “..governmental entities and the following category of activities: Medical services, rescue organizations, veterinarians, persons with disabilities, disaster relief organizations, school buses, beach patrols, establishments in isolated places, communications standby facilities, and emergency repair of public communications facilities. This strategy could be executed by licensing these channels on a statewide basis and issuing letters of authorization for mobile and portable use of these channels to specific agencies and entities.

The Steering Committee also indicated the current MIMS channel should continue as an incident management channel but indicated that the use of that channel for legacy point-to-point purposes will be replaced by the use of dispatch center ARMER stations. With respect to the ARMER VHF Interoperability Infrastructure, the most compelling candidate for a statewide calling channel is VCALL10 due to limited existing use and licensing in Minnesota. This application would be consistent with and support the FCC designation that channel as a nationwide calling channel. However, MIMS may be easier to license for fixed base station use along the Canadian border since current licenses in this area have been successfully coordinated with the FCC and Industry Canada on a primary basis. Similar attempts to license VCALL10 in other states, as well as Minnesota, along the Canadian border have resulted in antenna height limitations to protect incumbent users on adjacent channels in Canada. Since MIMS is therefore likely to become a designated primary calling channel in some areas of Minnesota, the



Steering Committee also voted to rename this channel as MNCOMM (Minnesota Common) once this channel is narrow banded.

The Steering Committee responses to the interoperability survey also included requests to reserve some slots in the interoperability zone for local or regional radio channels. After further discussions, the Steering Committee ultimately decided to include only those channels designated for statewide operations in this zone. This determination was consistent with the Steering Committee's purpose in establishing the zone, which was to offer a single zone for use in primarily incident-based operations of a singular nature that require responses from multiple disciplines and jurisdictions. This approach also provides uniform and consistent training in the use of the interoperability zone.

Inclusion of the channels for temporary deployable assets from the STR in the statewide interoperability zone was also appropriate given the purposes for which those assets are designated.

The Steering Committee also agreed that the naming and operating modes of the channels in the statewide interoperability zone should be consistent with the current ANSI standard for public safety interoperability channels. Where no such standard exists, for channels such as MNCOMM, DNRTAC1, MNFIRG2, MINFIRG3 and the VTAC14R, standards should be developed and adopted. The Steering Committee further concluded that migrating to the ANSI standard CTCSS codes during the narrowband transition provides the highest level of interoperability for users within and outside the state. Entities that require interoperability with users in adjacent states and regions that continue to use national interoperability channels in a non-standard manner should address this on a case-by-case basis outside of the Minnesota Statewide VHF interoperability zone.

**FE** recommends establishment of a statewide VHF Interoperability zone and that this zone be populated only with narrowband channels. This will allow public safety users to add this zone to their radios during the narrowband transition with standard naming conventions and operating modes. Prior to the narrowband transition, public safety agencies should continue operations using existing wideband VHF interoperability channels with their current channel names and operating parameters. After the narrowband transition, the statewide VHF interoperability channels should only be operated as listed in Table 8.



**Table 8 – Statewide VHF Interoperability Zone**

Mode #	STD NAME	SHORT NAME <sup>12</sup>	Mobile TX Freq	CTCSS or NAC	Mobile RX Freq	Original Name
1	VCALL10	VCAL10	155.7525	156.7	155.7525	
2	VTAC11	VTAC11	151.1375	156.7	151.1375	
3	VTAC12	VTAC12	154.4525	156.7	154.4525	
4	VTAC13	VTAC13	158.7375	156.7	158.7375	
5	VTAC14	VTAC14	159.4725	156.7	159.4725	
6	MNCOMM	MNCOMM	155.3700	156.7	155.3700	MIMS
7	VFIRE23	VFIR23	154.2950	156.7	154.2950	SWFIREMA
8	MNFIRG2	MNFG2	154.0100	156.7	154.0100	
9	MNFIRG3	MNFG3	153.8300	156.7	153.8300	
10	DNRTAC1	DNRT1	151.4750	CSQ	151.4750	
11	VLAW31	VLAW31	155.4750	156.7	155.4750	MINSEF
12	VMED28	VMED28	155.3400	156.7	155.3400	EMS HEAR
13	IR 2	IR 2	165.9625	167.9	170.4125	
14	VTAC14R	TAC14R	154.6875	156.7	159.4725	
15	NGRPTR <sup>13</sup>	NGRPTR	Restricted	Restricted	Restricted	
16	LE 2 <sup>14</sup>	LE 2	Restricted	Restricted	Restricted	

## 6.2 Narrowbanding Statewide VHF Interoperability Frequencies

DPS is working with the SRB to establish a 60-day transition period for converting the current primary statewide VHF interoperability channels to narrowband operation beginning on October 1, 2012. The channels included in this transition are shown in Table 9.

**Table 9 – Current Primary VHF Interoperability channels**

Standard Name	Wideband or Current Name	Mobile TX Freq.	ANSI STD TX/RX CTCSS/NAC	Mobile RX Freq.
VLAW31	MINSEF	155.475	156.7/CSQ	155.475
VFIRE23	SWFIREMA	154.295	156.7/CSQ	154.295
VMED28	EMS HEAR	155.340	156.7/CSQ	155.340
MNCOMM	MIMS	155.370	156.7/CSQ	155.370

<sup>12</sup> For use with limited character display radios

<sup>13</sup> Local option channel if not implemented with LOA or MOU for use of federal channels.

<sup>14</sup> Local option channel if not implemented with LOA or MOU for use of federal channels.



**FE** recommends development of a master schedule for the state that establishes and tracks a phased narrowband migration strategy on a county-by-county and regional basis for state and local public safety agencies operating base stations on these channels. The master narrowbanding schedule should be available to all affected agencies and be updated in a timely manner in order to accurately reflect the status of interoperability assets during the transition period.

**FE** also concurs with DPS in recommending that, in order to preserve interoperability, agencies continue to maintain wideband capability on these channels in mobile and portable radios until the narrowbanding deadline of January 1, 2013. This could be accomplished by programming or updating the four current statewide interoperability channels in existing radio modes and zones using wideband names as shown in Table 9 and adding the Statewide VHF interoperability zone with narrowband channels into their radios prior to the 60 day transition period.

DPS proposes that users should proceed with reprogramming base stations on these four statewide channels beginning on October 1, 2010. Reprogramming of mobile and portable radios could begin before that date if users retain wideband capabilities as well. DPS also urges all users to complete narrowbanding these channels in all their radios no later than November 30, 2012. All wideband operations on these channels must cease as of January 1, 2013.

During this 60 day narrowbanding transition period, significant difficulties communicating on these four primary statewide mutual aid channels may occur if users at an incident are attempting to communicate from a narrowband channel to a wideband channel and vice versa. Even though the operating frequency is unchanged, the substantial differences in operating bandwidth between these modes can cause low or muted audio and/or significant distortion of radio communications. In **FE's** opinion, this provides further justification for creating and maintaining a master narrowbanding schedule during the narrowbanding transition period.

### **6.3 Statewide VHF Interoperable Frequency Licenses**

**FE** recommends that DPS license all of the narrowband channels listed in Table 10 for statewide area of operations for mobiles (MO) and either fixed base temporary (FBT) or fixed mobile relay temporary (FB2T) as appropriate. This will allow all authorized agencies operating under an agreement with the State to operate mobile radios and fixed temporary bases or repeaters on the statewide VHF interoperability channels without having to file for and maintain separate licenses for these channels. This would also provide the state the ability to deploy temporary bases and repeaters on the



statewide interoperability channels as needed to support disaster and emergency responses.

**FE** also recommends that DPS establish separate licenses on the narrowband channels listed in Table 10 for fixed base (FB) operations as needed to integrate these channels into the ARMER VHF interoperability infrastructure. This integration will require close coordination with the local and regional public safety agencies in order to eliminate duplicated coverage, interference, and channel contention with existing bases. The SRB should also establish guidelines for the continued use and coordination of statewide interoperability channels with incumbent licenses that continue to operate fixed bases on these channels.

**Table 10 – Statewide VHF Interoperable Frequency Licensing**

ANSI Standard Name	Wideband or Current Name	Mobile TX/ Base RX Freq.	Mobile RX/ Base TX Freq.	Station Classes
VFIRE23	SWFIREMA	154.295	154.295	FBT,FB,MO
MNFIRG2	NA	154.010	154.010	FBT,MO
MNFIRG3	NA	154.830	154.830	FBT,MO
DNRTAC1	DNR TAC 1	154.475	151.475	FBT,MO
VLAW31	MINSEF	155.475	155.475	FBT,FB,MO
VMED28	EMS HEAR	155.340	155.340	FBT,FB,MO
LE 2	NA	162.2625	167.2500	FB2T, MO
IR 2	NA	165.9625	170.4125	FB2T, MO
VCALL10	NA	155.7525	155.7525	FBT,FB,MO
VTAC11	NA	151.1375	151.1375	FBT,FB,MO
VTAC12	NA	154.4525	154.4525	FBT,FB,MO
VTAC13	NA	158.7375	158.7375	FBT,FB,MO
VTAC14	NA	159.4725	159.4725	FBT,FB,MO
VTAC14R <sup>15</sup>	NA	154.6875	159.4725	FB2T, MO
MNCOMM	MIMS	155.370	155.370	FBT,FB,MO

## 6.4 VHF Interoperability Infrastructure Channels

In accordance with the current ARMER interoperability plan, approved by the SRB on January 28, 2010, **FE** recommends integration of the VCALL/VTAC channels and the primary VHF interoperability channels<sup>16</sup> into the ARMER VHF interoperability infrastructure. If integrated prior to the narrowband transition, then these channels

<sup>15</sup> Consistent with ANSI naming conventions but not an ANSI standard channel.

<sup>16</sup> VLAW31 (155.475), VFIRE23 (154.295), VMED28 (155.340) and MNCOMM (155.370)



should utilize their current operating parameters including bandwidth and CTCSS codes. After the narrowbanding transition, these channels should operate in a manner consistent with the ANSI standard for public safety interoperability channels including standardized CTCSS codes for fixed radios. It is significant to note that the ANSI standard stipulates the use of CTCSS Tone 156.7 Hz for all analog operations on FCC designated interoperability channels and that all fixed and subscriber analog transmitters shall encode 156.7 Hz.

### ***6.5 Development or Revision of State Radio Standards***

**FE** recommends that development of any new standards for the use of the Statewide VHF Interoperability Channels be consistent with the ANSI standard for public safety interoperability channels. These standards should expand the eligibility for use of VFIRE23, VLAW31, VMED28, and MNCOMM to all public safety agencies that would qualify for licensing public safety pool channels as defined by the FCC. Additionally, these standards should stipulate that the use of the interoperability channels must be consistent with the protocols outlined in the National Incident Management System (NIMS) and Incident Command System (ICS), specifically including the provisions for “plain language.” The new interoperability standards should also outline the proper use of these channels for itinerant and incident based communications as well as the procedures and conditions for patching these channels to local or statewide resources.

Existing standards documents, such as the Minnesota Fire Frequency Utilization Plan and the Minnesota EMS Radio Communications Plan, should also be updated to reflect the current use of frequencies within these plans. These plans should also be revised to be consistent with ANSI standard for public safety interoperability channels wherever possible. In some cases, such as Fire channels VFIRE21 (154.2800 MHz) and VFIRE22 (154.2650 MHz), which are designated in the Minnesota Fire Frequency Utilization Plan as Fire Frequency 69 and 70 respectively, this may not be feasible. In the Minnesota plan, these channels are allocated on a county-by-county basis with different CTCSS codes. This condition makes their current use inconsistent with the national standard and limits the use of these channels for statewide interoperability and with other users from adjacent states and regions that may use these channels as defined in the ANSI standard (CTCSS Code of 156.7 Hz). However, if these channels are still widely used for Fire service operations in the state, modifying these existing channels merely to be consistent with the national standard may not be viable. A more practical approach may be to note this inconsistent use in the plan and to allocate alternate channels for fire ground or mutual aid operations in the counties where these channels are being used. The Minnesota EMS Radio Communications Plan should also be updated to reflect the use of standard CTCSS codes for the national interoperability



channels such as VMED28, which is currently widely used in ambulances and hospitals in the state.

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## Appendix A - Statewide VHF Interoperability Zone Cheat Sheet

Mode #	STD NAME	SHORT NAME <sup>17</sup>	Mobile TX Freq	CTCSS or NAC	Mobile RX Freq	Original Name
1	VCALL10	VCAL10	155.7525	156.7	155.7525	
2	VTAC11	VTAC11	151.1375	156.7	151.1375	
3	VTAC12	VTAC12	154.4525	156.7	154.4525	
4	VTAC13	VTAC13	158.7375	156.7	158.7375	
5	VTAC14	VTAC14	159.4725	156.7	159.4725	
6	MNCOMM	MNCOMM	155.3700	156.7	155.3700	MIMS
7	VFIRE23	VFIR23	154.2950	156.7	154.2950	SWFIREMA
8	MNFIRG2	MNFG2	154.0100	156.7	154.0100	
9	MNFIRG3	MNFG3	153.8300	156.7	153.8300	
10	DNRTAC1	DNRT1	151.4750	CSQ	151.4750	
11	VLAW31	VLAW31	155.4750	156.7	155.4750	MINSEF
12	VMED28	VMED28	155.3400	156.7	155.3400	EMS HEAR
13	IR 2	IR 2	165.9625	167.9	170.4125	
14	VTAC14R	TAC14R	154.6875	156.7	159.4725	
15	NGRPTR <sup>18</sup>	NGRPTR	Restricted	Restricted	Restricted	
16	LE 2 <sup>19</sup>	LE 2	Restricted	Restricted	Restricted	

The standard mode of operation for the VCALL and VTAC channels is analog narrowband. All fixed, mobile, and portable radios should transmit using the 156.7 Hz CTCSS code. All mobile and portable radios should be set for carrier squelch unless CTCSS is necessary in order to mitigate interference.

The standard mode of operation for the IR2 channels is analog narrowband. All fixed, mobile, and portable radios should transmit using the 167.9 Hz CTCSS code. All mobile and portable radios should be set for carrier squelch unless CTCSS is necessary in order to mitigate interference.

The standard mode of operation for the LE2 channel is P25 digital narrowband, and all mobile and portable radios on this LE channel should use the \$68F digital network access code.

<sup>17</sup> For use with radios with limited character display

<sup>18</sup> Local option channel if not implemented with LOA or MOU for use of federal channels.

<sup>19</sup> Local option channel if not implemented with LOA or MOU for use of federal channels.





## Appendix B – Proposed VHF Interoperable Frequency Use Agreement

\_\_\_\_\_ COUNTY, MINNESOTA

### VHF INTEROPERABLE FREQUENCY USE AGREEMENT

**Whereas**, the \_\_\_\_\_, as the governing body of \_\_\_\_\_ County desires to enter into an agreement with the State of Minnesota, Department of Public Safety (DPS) for use of certain state licensed radio frequencies for the purpose of coordination between emergency response agencies and resources.

**Whereas**, \_\_\_\_\_ County is a member of the \_\_\_\_\_ Regional Radio Board (RRB).

**Whereas**, participation in the Minnesota VHF Interoperable Frequency Plan must be approved by the County and submitted to the RRB for approval before radio equipment intended for use by public safety officials within the County can be programmed and used under the state license.

**Now Therefore**, the \_\_\_\_\_, as the governing body of \_\_\_\_\_ County approves the Minnesota VHF Interoperable Frequency Plan agreement applicable to the use of state licensed radio frequencies by County public safety officials:

#### I. Background

To the extent permitted by federal laws and regulations, the Statewide Radio Board (SRB), operating as the State Interoperability Executive Committee (SIEC), is responsible for developing guidelines and standards for the use of interoperability frequencies on all frequency spectrums assigned to public safety users in Minnesota. Given the widespread use of VHF frequencies in the state by agencies not utilizing ARMER, the Minnesota Department of Public Safety has developed a VHF Interoperable Frequency Plan to provide guidance for the use of VHF interoperable frequencies by public safety agencies operating in Minnesota during local, regional, and statewide emergency responses. The plan was subsequently approved by the SRB on **MM/DD/YYYY**.

Under this plan, DPS will also license all of the narrowband channels listed in Appendix A - Statewide VHF Interoperability Channels for statewide operations with mobiles and fixed temporary bases or fixed mobile relays (repeaters) as appropriate by July 1, 2011. This allows authorized agencies operating under this agreement with DPS to operate mobile radios and temporary bases or repeaters on the statewide VHF interoperability channels without having to file for and maintain separate licenses for these channels. This also provides the state the ability



to deploy temporary bases and repeaters on the statewide interoperability channels as needed to support disaster and emergency responses.

DPS will also establish separate licenses for the narrowband channels listed in Section IV for permanent fixed base operations as needed to integrate these channels into the ARMER VHF interoperability infrastructure. This phase of the plan will be completed in July 2012 in order to provide sufficient time for the transition of these channels to narrowband operations by January 2013 as mandated by the FCC. Continued operation of fixed bases on these channels by local and regional public safety agencies after January 1, 2013 must be coordinated and documented with DPS and Mn/DOT in order to eliminate duplicated coverage, interference, and channel contention.

## **II. Determination of Need**

There is a need to provide standardized interoperability channels in the VHF band between VHF public safety radio users that may respond to incidents within the state and between these VHF radio users and ARMER radio system users.

## **III. Terms of Agreement**

The Minnesota DPS shall apply for, manage, and maintain proper licenses for the use of statewide VHF interoperability channels. DPS shall also manage and maintain an accurate database of federal, state, and local agencies that have agreed to participate in the standardized use of these channels. DPS will issue updates and revisions to the Minnesota VHF Interoperable Frequency Plan contained herein as directed by request by the Statewide Radio Board.

The County shall participate in regional communications planning and manage use of the statewide VHF interoperability channels by public safety agencies within the county, ensuring compliance with the Minnesota VHF Interoperable Frequency Plan as well as applicable federal, state, and local laws, ordinances and regulations.

Minnesota DPS and the County mutually agree to the following conditions for use of the statewide VHF interoperability channels:

- Use the statewide VHF interoperability channels for day-to-day coordination, for urgent or emergency mutual aid situations, for task forces, for tactical teams, and for other purposes. Such coordination may occur during interagency operations, en-route travel, or on-incident.
- Use of the statewide VHF interoperability channels must be in compliance with the rules governing the VHF frequencies, and be authorized by the Incident Command (IC) or Unified Command (UC) structure at the scene of the incident or planned event.



- Radio communications procedures on the statewide VHF interoperability channels must consistent with the National Incident Management System (NIMS) and Incident Command System (ICS) including the use of “plain language” without 10-codes or agency-specific codes/jargon.
- When operating on the statewide VHF interoperability channels, users should initially identify in the following manner using plain English: Agency name, followed by service branch or function designation, followed by call sign or unit number. Examples: "North EMS 512", "Elk River Police 512", "Washington County Public Works 512", "State Patrol 512", etc. Once established, ongoing communications between the same units may be shortened.

#### IV. VHF Statewide Interoperability Zone

To facilitate uniform field access to the statewide VHF interoperability channels, all VHF subscriber radios authorized under this agreement should be programmed to include the following standardized VHF Statewide Interoperability Zone or “SI Zone”.

Mode #	Standard Name	Current Name	Mobile TX Freq.	CTCSS/NAC	Mobile RX Freq.
1	VCALL10		155.7525	156.7	155.7525
2	VTAC11		151.1375	156.7	151.1375
3	VTAC12		154.4525	156.7	154.4525
4	VTAC13		158.7375	156.7	158.7375
5	VTAC14		159.4725	156.7	159.4725
6	MNCOMM	MIMS	155.3700	156.7	155.3700
7	VFIRE23	SWFIREMA	154.2950	156.7	154.2950
8	MNFIRG2		154.0100	156.7	154.0100
9	MNFIRG3		153.8300	156.7	153.8300
10	DNRTAC1		151.4750	CSQ	151.4750
11	VLAW31	MINSEF	155.4750	156.7	155.4750
12	VMED28	EMS HEAR	155.3400	156.7	155.3400
13	IR 2		165.9625	167.9	170.4125
14	VTAC14R		154.6875	156.7	159.4725
15	NGRPTR*		Restricted	Restricted	Restricted
16	LE 2*		Restricted	Restricted	Restricted

\* Local option if not implemented with LOA or MOU.



**V. Units Operating Under State License**

The specific number of units that the County desires to operate under the state license is shown below.

<b>Class of Operation</b>	<b>Number of Units</b>
Mobiles	
Portables	
Fixed Temporary Base	
Fixed Temporary Mobile Relay	

**VI. Fixed Stations Operating Under County License**

The County desires to continue to operate and maintain fixed stations on the state VHF interoperability as indicated below. The County and DPS mutually agree to coordinate use of these channels in order to eliminate duplicated coverage, interference, and channel contention with existing bases in the ARMER VHF interoperability infrastructure. The County and DPS may also mutually agree to include County maintained interoperability channels in the ARMER VHF interoperability infrastructure. The County shall ensure that County maintained interoperability calling channels not integrated into the ARMER VHF interoperability infrastructure are continuously monitored by the dispatch centers indicated below. As of January 2013, the operating parameters of any fixed stations on the state VHF interoperability channels operated and maintained by the County shall also be consistent with the Minnesota VHF Interoperable Frequency Plan including the use of standardized CTCSS codes.

<b>FCC Call Sign</b>	<b>Frequency</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Dispatch Center</b>



**VII. Designated Local Administrator**

The following person is designated as the County contact for any issues related to operation and use of the statewide VHF interoperability channels:

\_\_\_\_\_ (Name and title)

\_\_\_\_\_ (Telephone number)

\_\_\_\_\_ (e-mail address)

Approved and adopted by the County on \_\_\_\_\_ of \_\_\_\_\_, 2010.

\_\_\_\_\_  
\_\_\_\_\_



## Appendix C - VHF Interoperability Channel Use in Adjacent States

VCALL10/155.7525 MHz	
ND	Staging Area Manager Net, Statewide interop zone 5, channel 7
SD	Emergency Use Only for all first responder/public safety radios
IA	Described in SCIP
WI	Public safety interagency calling channel
VTAC11/151.1375 MHz	
ND	Incident/Unified Command Net (Alternate/Spare), Statewide interop zone 5, channel 4
SD	Emergency Use Only for all first responder/public safety radios
IA	Described in SCIP
WI	Public safety interagency tactical communications, also have digital version described in plan
VTAC12/154.4525 MHz	
ND	Incident/Unified Command Net (Alternate/Spare), Statewide interop zone 5, channel 5
SD	Emergency Use Only for all first responder/public safety radios
IA	Described in SCIP
WI	Public safety interagency tactical communications, also have digital version described in plan
VTAC13/158.7375 MHz	
ND	Operations Section Chief Net, Statewide interop zone 5, channel 6
SD	Emergency Use Only for all first responder/public safety radios
IA	Described in SCIP
WI	Public safety interagency tactical communications, also have digital version described in plan



<b>VTAC14/159.4725 MHz</b>	
ND	EMS Tactical 2 (EMS Division/Branch/Group)
SD	Emergency Use Only for all first responder/public safety radios
IA	Described in SCIP
WI	Public safety interagency tactical communications, also have digital version described in plan
<b>VFIRE23/154.295 MHz/FIRESWMA</b>	
ND	Statewide Fire channel, Statewide common zone 3, channel 4 - Fire Command (Lead Tactical Fire Official)
SD	Statewide Fire channel, Mutual Aid 2 (VFIRE22 is Statewide Fire Mutual Aid 1)
IA	Uses 154.280 (VFIRE21) as statewide fire mutual aid
WI	Fire ground Blue, uses VFIRE 22 as statewide fire mutual aid
<b>VMED28 /155.340 MHz/EMS HEAR</b>	
ND	Statewide EMS channel, Statewide common zone 3, channel 5 - EMS Command (Lead Tactical EMS Official)
SD	Statewide EMS channel 3
IA	Statewide EMS mutual aid
WI	State EMS BLS channel (155.400 used as EMS ALS channel)
<b>VLAW31 /155.475 MHz/MINSEF</b>	
ND	Used as statewide mutual aid channel, (Statewide common zone 3, channel 3)
SD	Law Enforcement Use Only
IA	Statewide LEA mutual aid
WI	WISPERN - Law enforcement, used by other disciplines only if directed by law enforcement
<b>MNCOMM/155.370 MHz/MIMS</b>	
ND	Law Command (Lead Tactical Law Enforcement Official)
SD	Not widely used, not part of state plans
IA	Statewide point to point channel
WI	Statewide point to point channel, used by other disciplines only if directed by law enforcement

