


Summer 8-15-2017

Expansion of Microbial Virology by Impetus of the Reduction of Viral Dark Matter

Siddharth Ravindran Krishnamurthy
Washington University in St. Louis

Follow this and additional works at: https://openscholarship.wustl.edu/art_sci_etds

 Part of the [Allergy and Immunology Commons](#), [Immunology and Infectious Disease Commons](#), [Medical Immunology Commons](#), and the [Virology Commons](#)

Recommended Citation

Krishnamurthy, Siddharth Ravindran, "Expansion of Microbial Virology by Impetus of the Reduction of Viral Dark Matter" (2017). *Arts & Sciences Electronic Theses and Dissertations*. 1221.
https://openscholarship.wustl.edu/art_sci_etds/1221

This Dissertation is brought to you for free and open access by the Arts & Sciences at Washington University Open Scholarship. It has been accepted for inclusion in Arts & Sciences Electronic Theses and Dissertations by an authorized administrator of Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu.

WASHINGTON UNIVERSITY IN ST. LOUIS

Division of Biology and Biomedical Sciences
Immunology

Dissertation Examination Committee:

David Wang, Chair

Gaya Amarasinghe

Gautam Dantas

Michael Diamond

Daved Fremont

S Josh Swamidass

The Reduction of Viral Dark Matter by Expanding of Viral Diversity

by

Siddharth Ravindran Krishnamurthy

A dissertation presented to
The Graduate School
of Washington University in
partial fulfillment of the
requirements for the degree
of Doctor of Philosophy

August 2017
Saint Louis, MO

Table of Contents

List of Figures	.....	iii
List of Tables	.....	iv
List of Abbreviations	.....	v
Acknowledgments	.....	vi
Abstract	.....	ix
Chapter 1	Introduction.....	1
Chapter 1	References.....	16
Chapter 2	Hyperexpansion of RNA bacteriophage diversity.....	21
Chapter 2	References.....	53
Chapter 3	Identification of a novel bunya-like virus using DiscoVir, an alignment independent k-mer algorithm for viral sequence classification.....	56
Chapter 3	References.....	94
Chapter 4	Identifying RNA Phage Resistance Genes.....	96
Chapter 4	References.....	105
Chapter 5	Picobirnaviruses are a possible novel family of RNA bacteriophages.....	106
Chapter 5	References.....	118
Chapter 6	Conclusions and Future Directions.....	120
Chapter 6	References.....	125
Appendix I	List of SRA Files Scanned for RNA Bacteriophages.....	127
Appendix II	Taxonomy Breakdown for DiscoVir Analysis.....	164
Appendix III	List of SRA Files Searched for Novel Discovirus Sequences.....	166
Curriculum Vitae	.....	355

List of Figures

Figure 1.1	Generic overview of alignment based viral sequence identification.....	3
Figure 1.2	Assembly can identify more reads from novel viruses than direct alignment.....	7
Figure 1.3	The distribution of viral genomes in RefSeq GenBank as defined by their host species.....	8
Figure 1.4	A presence/absence plot of viral families that infect specific host types from the various Baltimore classification groups.....	8
Figure 2.1	Phylogenetic analyses of novel RNA bacteriophages discovered in metagenomic sequencing datasets.....	34
Figure 2.2	Unique characteristics of novel RNA bacteriophage.	38
Figure 2.3	Presence/absence heatmaps of RNA bacteriophage prevalence based on metagenomic sequencing in Rhesus Macaque Study 1.	42
Figure 2.4	Maximum-likelihood phylogenetic analysis.....	43
Figure 3.1	Performance of DiscoVir compared to BLASTx in a simulated experiment for identifying novel viral sequences.	63
Figure 3.2	Simulated experiment using DiscoVir and BLASTx with comparisons that involve Proteobacteria and Terrabacteria highlighted.....	64
Figure 3.3	Simulated experiment using DiscoVir and BLASTx with comparisons that involve Carnotetraviridae, Virgaviridae, and Idaeovirus highlighted.....	64
Figure 3.4	Simulated experiment using DiscoVir and BLASTx with each fungal taxa highlighted.....	65
Figure 3.5	Early retrieval rate was measured for the simulated experiment using CROC curves.....	66
Figure 3.6	Phylogeny and genome organization of Discovirus.....	68
Figure 3.7	Discovirus containing Penicillium colony morphology on SDA plate from serum of a patient with acute febrile illness.	70
Figure 3.8	Penicillium discovirus containing fungus phylogenetically clades among Penicillium species....	71
Figure 3.9	Detection of Discovirus genome segments in isolated Penicillium.....	73
Figure 3.10	Penicillium discovirus is maintained for multiple generations of Penicillium.....	75
Figure 4.1	RPKM abundance of metagenomic fragments in each selection round.	99
Figure 4.2	Q β , MS2 and C-1 infection curves with overexpressed metagenomic fragments.....	100
Figure 4.3	Efficiency of plating of Q β , MS2, fd and C-1 with overexpressed metagenomic fragments.....	101
Figure 5.1	Genome organization of Human Picobirnavirus.....	108
Figure 5.2	Alignment of RBS sequences among known and novel picobirnaviruses.....	110
Figure 5.3	RBS sequence enrichment among eukaryotic DNA and RNA viral sequences and bacteriophages.....	111
Figure 5.4	Schematic of initial HPBV reverse genetics system.....	111
Figure 5.5	Transmission electron microscopy of the overexpressed picobirnaviral segments.	112
Figure 5.6	Schematic of low copy HPBV reverse genetics system.....	113
Figure 5.7	HPBV2 WT Segment 2 dos not decrease slower than the catalytically dead mutant.....	113
Figure 5.8	Schematic of HPBV constructs containing chloramphenicol resistance genes.....	114

List of Tables

Table 2.1	List of novel ssRNA phage partial genomes.....	28
Table 2.2	List of novel dsRNA bacteriophage partial genomes.....	33
Table 2.3	Number of ssRNA bacteriophage species based on varying amino acid identity cut-offs.....	35
Table 2.4	Nucleotide alignment identities of AVE001 amplicons from the screening of Rhesus Macaque Study 1.	43
Table 2.5	Nucleotide alignment identities of AVE000 amplicons from the screening of Rhesus Macaque Study 1.	44
Table 2.6	List of primers used to confirm partial genomes by Sanger sequence.....	48
Table 3.1	Optimization of DiscoVir parameters.	60
Table 3.2	Assembled contig prediction by DiscoVir.....	69
Table 3.3	Penicillium discovirus like sequences found in other fungi and plants.....	76
Table 3.4	Penicillium discovirus like contigs assembled from SRA samples.....	83
Table 3.5	Primers.....	90

List of Abbreviations

Abbreviation	Full Name
BHI	Blood Heart Infusion
CAT	Chloramphenicol Acetyl Transferase
CLASH	cross-linking, ligation and sequencing hybrids
contigs	Contiguous Sequence
CROC	Concentrated ROC
dsDNA	Double-Stranded DNA
dsRNA	Double-Stranded RNA
HPBV	Human Picobirnavirus
ICTV	International Committee on the Taxonomy of Viruses
ITS	Internal Transcribed Spacer
LB	Lysogeny Broth
NBC	Naïve Bayes Classifier
NCBI	National Center for Biotechnology Information
NEPRC	New England Primate Research Center
nr	Non-redundant protein database
nt	Non-redundant nucleotide database
ORF	Open Reading Frame
OTU	Operational Taxonomic Unit
RACE	Rapid amplification of cDNA ends
RBS	Ribosomal Binding Site
RdRp	RNA dependent RNA Polymerase
ROC	Receiver Operator Characteristic
SDA	Sabouraud Dextrose Agar
SIV	Simian Immunodeficiency Virus
SRA	Sequence Read Archive
ssDNA	Single-stranded DNA
ssRNA	Single-stranded RNA
SVM	Support Vector Machine
TEM	Transmission Electron Microscopy
TNPRC	Tulane Primate Research Center

Acknowledgments

I have been lucky to have an amazing thesis committee. They have provided me invaluable insight into all my scientific projects as well as my personal professional development. I am truly grateful for the time Dr. Josh Swamidass spent with me deepening my knowledge of machine learning and providing absolutely critical insight on how to develop DiscoVir; this project would not have been possible without his help and has been truly trajectory altering for me. Discussions with Dr. Daved Fremont has broadened my view on how to capitalize on the genetic diversity of large, dsDNA viruses to understand biology, and I plan to use this viewpoint to inform my future projects. Dr. Michael Diamond provided me with critical resources to perform mouse experiments dealing with RNA bacteriophages and as well as an intellectual framework by which to examine host genes in the context of multiple viruses rather than a single virus. Dr. Gautam Dantas was extremely gracious in connecting me with members with his lab that were familiar with functional metagenomic screens, as well as providing the initial libraries to perform this screen; the ability to work on this project has also been truly trajectory altering. Dr. Gaya Amarasinghe has also provided me with invaluable insight on how to study RNA structure.

I would also like to thank my collaborators and informants outside of the Wang lab complex. Nathan Crook from the Dantas Lab has been invaluable in helping me design and analyze the functional metagenomic screen for RNA phage resistance genes. Dr. Anca Segall from San Diego State University provided critical direction in how to perform bacteriophage assays correctly. Dr. Mario Feldman, Dr. Christina Stallings, and their labs provided useful guidance on bacterial genetics as well as reagents and equipment to perform most of the phage

infection experiments. I would also like to thank Dr. Stephen Beverley for his useful insights on microbial virology.

All of the database scans for novel viruses, (whether RNA bacteriophages, Discovirus or picobirnaviruses) was greatly facilitated by the infrastructure set up and maintained by the Pathogen Discovery Core, namely Guoyan Zhao, Lindsay Droit and Scott Handley. Additionally, the Wang lab has been a great place to work and develop as a scientist.

I have been lucky enough to be supported by the Infectious Diseases Training Grant, for which I thank the Department of Infectious Diseases. Additionally, I would like the generosity of Angela Zeng and Shawn Hu for their donation to the Department of Pathology and Immunology that was the foundation for the scholarship I received. I additionally would like to thank Dr. Daved Fremont for nominating me for this scholarship.

I am extremely lucky to have David Wang as a research mentor. Dave has provided me the opportunity to work on amazing projects that have really allowed me to develop a unique scientific skill set. His open attitude toward science and collaborations has not only allowed me to take advantage of the global collaborations he has made, but also allowed me to discuss my work more broadly and gain larger insight on my projects. It was a huge risk to take a student without an extensive programming background and allow him to take on a computational project in the lab, but I'm extremely grateful that Dave took that risk.

I would like to acknowledge my friends, who have been useful throughout my years in graduate school, as well as my family, nuclear and extended, who have always expressed (or at least feigned) excitement about my scientific pursuits.

Siddharth Krishnamurthy

Washington University in Saint Louis

August 2017

ABSTRACT OF THE DISSERTATION

Expansion of Microbial Virology by Impetus of the Reduction of Viral Dark Matter

by

Siddharth Ravindran Krishnamurthy

Doctor of Philosophy in Biology and Biomedical Sciences

Immunology

Washington University in St. Louis, 2017

Professor David Wang, Chair

Modern metagenomic methods have rapidly accelerated the rate of viral discovery. Currently, to discover a novel virus, deep sequencing reads must align to a known reference virus. While alignment is effective at identifying closely related viruses, highly divergent viruses can often share no discernable sequence alignment with known viruses. Therefore, the accurate classification of viral dark matter – metagenomic sequences that originate from viruses but do not align to any reference virus sequences – is one of the major obstacles in not only discovering novel viruses, but also by extension, comprehensively defining the virome. As viral dark matter results fundamentally from a failure to align sequence reads, two major contributors to viral dark matter include 1) the lack of diversity in specific viral families and 2) the reliance on alignment as a metric to define viral taxonomy. In this dissertation, I address each of these issues. These projects resulted in a massive expansion in understanding of microbial virus diversity, which led me to further interrogate the biology of microbial viruses. Specifically, I attempted to identify novel antiviral mechanisms against RNA bacteriophages and possibly identify a novel family of RNA bacteriophages.

First, I addressed the underrepresentation of viral sequences in databases by identifying a specific underrepresented class of virus, bacteriophages with RNA genomes, and systematically discovered highly divergent novel RNA bacteriophages in previously sequenced data. I identified 161 partial genome sequences from at least 122 RNA bacteriophage phylotypes that are highly divergent from each other and from previously described RNA bacteriophages. These partial genome sequences displayed multiple novel genome organizations previously unknown for RNA bacteriophages, and in aggregate, encoded 91 open reading frames (ORFs) that did not align to any known protein; sequences related to these ORFs would be described as viral dark matter in absence of this systematic discovery effort.

This new level RNA bacteriophage diversity suggested that RNA bacteriophages might be major predators of bacteria in the environment. In turn, this would suggest that there might be active resistance mechanisms in bacteria that specifically antagonize RNA bacteriophages; as of now however, there are no active mechanisms known in bacteria that can antagonize RNA bacteriophages. Therefore, one goal was to identify bacterial genes that can restrict RNA bacteriophage infection. I performed a functional metagenomic screen to identify RNA phage resistance genes. From this, I identified four genes that conferred resistance to the RNA phages, Q β and MS2 but not the RNA phage C1.

Additionally, this expansion of RNA bacteriophage diversity suggests that there might be new families of RNA bacteriophages that are unrelated to the previously discovered RNA bacteriophages. One candidate eukaryotic viral family that might in fact be RNA bacteriophages are *Picobirnaviridae*. Picobirnaviruses are bisegmented RNA viruses that are highly prevalent in stool. By analyzing previously sequenced datasets, I discovered multiple new picobirnavirus

segments. From analyzing the upstream regions of the ORFs on these segments, I found that almost all of the ORFs are preceded by a bacterial ribosomal binding sequence. This conservation of bacterial ribosomal binding sequences suggests that these viruses might infect bacteria. I then unsuccessfully tried to show that Human Picobirnavirus can replicate in bacterial cells.

Second, I addressed the reliance on alignment based algorithms by developing a novel alignment-independent algorithm to identify viral sequences. This algorithm, DiscoVir, is a support vector machine (SVM) model that relies on nucleotide k-mer frequencies to discriminate sequences of novel, highly disparate eukaryotic viruses from prokaryotic and fungal sequences. I validated in silico that DiscoVir can identify viruses from novel viral taxa and that it outperforms BLASTx for almost all viral families. When applied to an authentic metagenomic dataset, DiscoVir identified two additional contigs that corresponded to two undetected segments of a novel bunya-like virus. By selectively culturing fungi from this serum sample, I identified an isolate of *Penicillium atramentosum* that contained all three viral RNA segments, thus suggesting that this fungal isolate was in fact the host of this novel virus. I sequenced the whole genome of this novel virus and demonstrated that the terminal nucleotide sequences were conserved between the three segments, and these sequences were consistent with the termini of bunyaviruses in the genera Phlebovirus and Tenuivirus. Thus, application of DiscoVir played a critical role in the identification of the first segmented negative stranded RNA virus infection of a fungus.

Taken together, I have contributed to the systematic reduction of viral dark matter using two different approaches, both of which enable future researchers to identify a much more

diverse repertoire of viruses than previously possible. This increased ability to identify highly divergent viruses will better enable the metagenomics community to accurately identify the role of viruses in larger biological processes, including but not limited to, human disease.

1. Introduction

This work has been published in part in *Virus Research* (2017)

Authors: Siddharth R Krishnamurthy¹, David Wang*¹

Affiliations: ¹Departments of Molecular Microbiology and Pathology and Immunology, Washington University School of Medicine, St. Louis, MO 63110, USA

Abstract: The accurate classification of viral dark matter –metagenomic sequences that originate from viruses but do not align to any reference virus sequences– is one of the major obstacles in comprehensively defining the virome. Depending on the sample, viral dark matter can make up from anywhere between 40-90% of sequences. This review focuses on the specific nature of dark matter as it relates to viral sequences. We identify three factors that contribute to the existence of viral dark matter: the divergence and length of virus sequences, the limitations of alignment based classification, and limited representation of viruses in reference sequence databases. We then discuss current methods that have been developed to at least partially circumvent these limitations and thereby reduce the extent of viral dark matter.

Highlights:

- Primary sequence alignment is the most common method to identify viral sequences
- Alignment methods are limited by low identity query sequences
- Low diversity in viral databases limit alignment based methods
- Experimental methods can specifically enrich viral sequences in sequencing datasets
- Computational methods use virus specific attributes to identify viral sequences

Introduction

Next generation sequencing has accelerated the rate at which novel viruses can be discovered. Sequence based viral discovery relies on aligning sequences to known reference genome or protein databases. This approach has been successful in identifying novel viruses that infect hosts from every major taxon of life: e.g. vertebrates ^{1,2}, arthropods ³, plants ⁴, fungi ⁵, bacteria ^{6,7} and archaea ⁸. However, highly divergent viruses may lack any primary sequence similarity to any previously sequenced virus. By comparison to other microbes, the identification of viruses and sub-viral agents pose a particular challenge as they lack a universally conserved gene analogous to the 16S rRNA gene in bacteria or the internal transcribed spacer

(ITS) in fungi⁹. This problem is compounded by the fact that many viruses mutate faster than any cellular organism.

Formally, dark matter is defined negatively: any nucleotide sequence that cannot be taxonomically assigned by alignment to any reference nucleotide or amino acid sequence (Figure 1.1). Viral dark matter is the subset of dark matter that originates from viruses. With total metagenomic data, sequences that do not align to any known organism could be from any organism and need not necessarily be viral. From studies that use experimental techniques to purify viral particles, 40-90% of sequences are unalignable¹⁰⁻¹³. Sequence alignment depends primarily on two variables: the experimental parameters used for sequencing and the computational strategies used for analysis. In this review, we first describe what enables and limits the alignment of sequences to viruses; subsequently, we discuss experimental and computational methods designed to alleviate some of these issues.

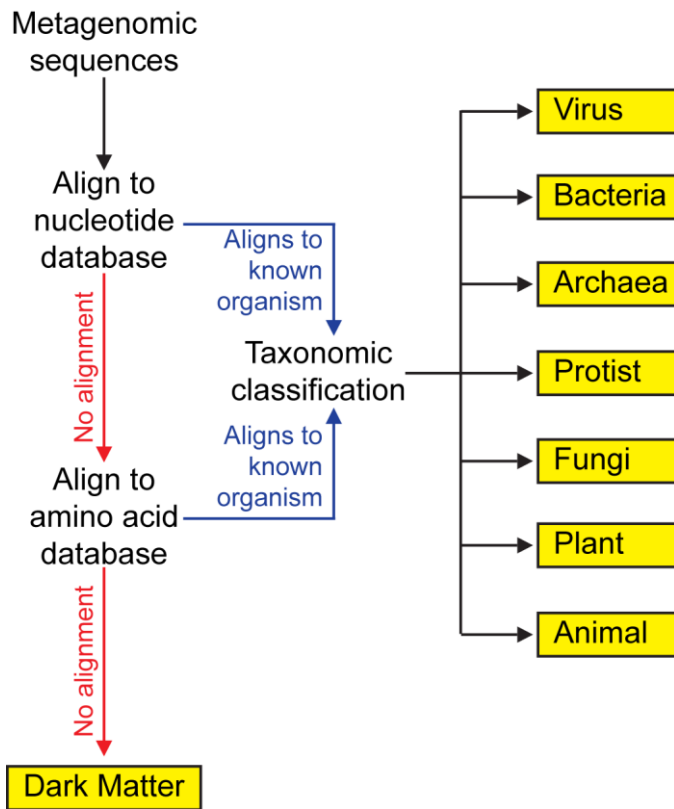


Figure 1.1. Generic overview of alignment based viral sequence identification

Limits of Alignment Based Classification

Currently, taxonomic classification of a given sequence as being viral in origin is dependent upon statistically significant alignment to known reference virus sequences. There are three fundamental components to aligning a viral sequence accurately to a known virus: the sequence being aligned, the alignment algorithm used, and the database of viral sequences. All three of these components can contribute to the inability of a given sequence to align to known viral sequences.

Alignment Algorithms

In principle, all aligners take in user defined sequences, referred to hereafter as “queries”, and compare them to a database of sequences of known taxonomic origin. Next generation sequencing often relies on short read aligners, such as Bowtie, SOAP or BWA, to efficiently align reads with high nucleotide identity to a known genome¹⁴⁻¹⁶. However, these aligners by design target nucleic acid sequences and do not generally allow extensive mismatches. Thus, they cannot identify sequences from highly divergent viral species that share only amino acid similarity to reference genomes. Consequently, although computationally slower, BLAST is still the most commonly used algorithm to align sequence reads to nucleotide databases for viral taxonomic classification¹⁷⁻²¹. Even more highly divergent viruses often require translation of these sequences to amino acids and alignment to known viral protein databases. This protein alignment is most often performed by BLASTx²². One limitation of protein alignment strategies is that they cannot be employed on the small proportion of agents that do not encode proteins, such as viroids. More rapid amino acid based alignment applications, such as DIAMOND and RAPSearch, have been developed that approximate the sensitivity of BLASTx, making large-scale protein based alignments more computationally feasible^{23,24}. DIAMOND and RAPSearch have successfully been used for virus discovery^{5,25,26}. Although amino acid alignment algorithms are more sensitive than their nucleotide counterparts, they are dependent upon the quality and completeness of databases of predicted protein

sequences used. Translated nucleic acid alignment algorithms can obviate this need, but they are much more computationally intensive.

Profile Based Methods

Alignment algorithms calculate distance between two sequences by using a generalized substitution matrix that equally penalizes mismatches at all residues of a sequence. However, from an evolutionary perspective, not all residues in a sequence are equally mutable, with some domains being highly conserved across multiple species; therefore, mutations in these highly conserved domains should be considered more divergent than those in non-conserved regions. Capitalizing on this idea, profile based methods create a substitution matrix specific for each position by integrating position specific information from a multiple sequence alignment of evolutionarily conserved proteins. This idea allows profile methods, including the hidden markov models, Pfam and HMMER, to be more sensitive than direct pairwise alignment^{27,28}. Profile models have been used to identify distant homologs of proteins that lack primary amino acid alignment. Recently, groups have mined viral proteins and generated profiles for viral specific proteins and have applied them to identify novel viral sequences^{29,30}.

Structural alignment algorithms

Although BLASTn and BLASTx together are most commonly used for the identification of viral sequences, more sensitive methods exist that are not typically used for next generation sequencing applications because their computational intensity makes them largely prohibitive for this function. One such algorithm is Phyre2, which structurally threads amino acid sequences into known structures. In a few studies, Phyre2 has been used to identify structural proteins and polymerases that often have no detectable primary sequence alignment³¹⁻³³.

Query Sequences

As BLAST is the most commonly used method for viral sequence identification, we will limit our discussion of the queries and databases of aligners to BLAST. BLAST based alignment algorithms measure alignment quality using a bit score, a log transformed number that measures the number of similar residues between two sequences. A high bit score can result either from a short alignment of sequence similarity or a very long alignment with low sequence similarity. Thus, shorter reads must have a higher degree of similarity to reference sequences in order to achieve a statistically significant alignment. Given that the length of individual sequence reads of most platforms currently ranges between 50 – 400 nucleotides³⁴, for a highly divergent virus, there will likely be many individual reads that cannot be aligned to reference sequences. This problem of short divergent reads, in some instances, can be obviated by assembling these reads into longer contiguous sequences (contigs), and then using those contigs as query sequences (Figure 1.2). In addition to increasing the sensitivity of detection of similarity to reference sequences, the assembly of contigs also enables reads derived from viral genes with no similarity to known viruses to be classified using genomic context; specifically a gene can be inferred as viral if it co-occurs on a contig that has a gene that aligns to a known viral gene. Novel viral genes have been identified this way for many viruses³⁵⁻³⁷. However, assembling contigs is not always possible, specifically with viruses that have lower coverage. Additionally, sequence reads can be misassembled into chimeric contigs, erroneously connecting a viral sequence to a non-viral sequence.

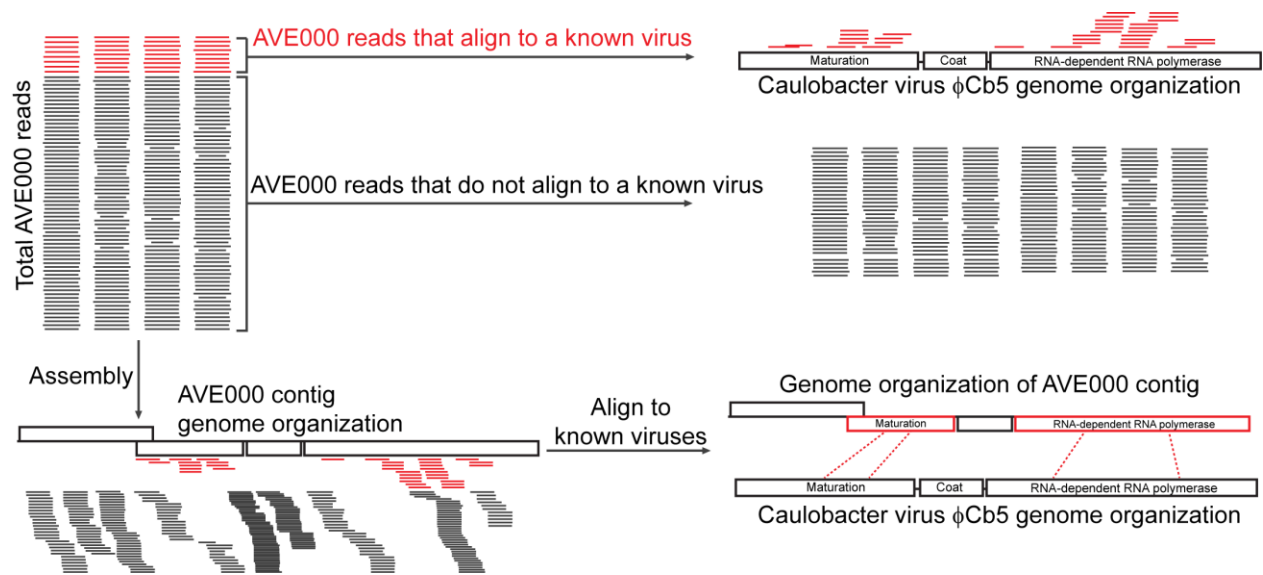


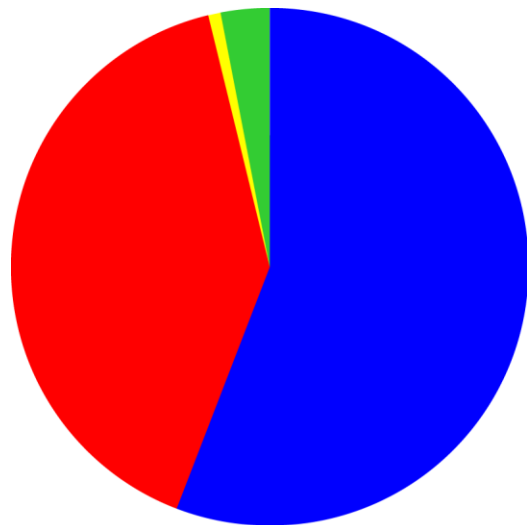
Figure 1.2. Assembly can identify more reads from novel viruses than direct alignment. An example virus, AVE000, from real data (PRJEB9503) shows that in this sample, there are more unalignable reads (black lines) than alignable reads (red lines) that map to AVE000. Upon assembly, all of these reads form a single contig that reveal 4 ORFs, two of which align to a known virus, while the other two are inferred as viral by genomic proximity. Aligned regions of AVE000 are represented by red dashed lines.

Viruses with segmented genomes, a common genomic organization characteristic of many families, provide particular challenges to virus discovery. For all segments from a divergent virus to be identified, each viral segment must contain an alignable gene to a known viral reference sequence. There are instances when a highly conserved gene, such as the RNA-dependent RNA polymerase, can be aligned to a reference virus, but viral proteins from other less well conserved genes on distinct viral genome segments cannot be aligned^{38,39}. In such cases, only a portion of the novel virus will be identified. Thus, while the most conserved genes can flag the presence of a multi-segmented virus, not all of the viral segments can necessarily be identified through sequence analysis alone.

Databases

A critical component to identifying viral sequences is a diverse, representative database of viral nucleotide and amino acid sequences. Although there has been a rapid expansion in the number of viral sequences in the Genbank non-redundant database, the sequences are largely biased towards mammalian, plant and bacterial viruses (Figure 1.3). Furthermore, the current limits of known viral diversity as they relate to

hosts and Baltimore classification also likely contribute to the distribution of viral dark matter. Although there are known viruses from every Baltimore classification that infect vertebrates, there are many host types that lack sequenced viruses of specific Baltimore classes (Figure 1.4). Increased metagenomic studies of non-vertebrates have the potential to address this deficiency⁴⁰. One example of this und



- Animal or Plant Viruses (2854)
- Fungal or Protist Viruses (156)
- Bacterial Viruses (2060)
- Archaeal Viruses (39)

Figure 1.3. The distribution of viral genomes in RefSeq GenBank as defined by their host species.

	Group I - dsDNA	Group II - ssDNA	Group III - dsRNA	Group IV - ssRNA+	Group V - ssRNA-	Group VI - RNA Retrovirus	Group VII - DNA Retrovirus
Animal	Red	Red	Red	Red	Red	Red	Red
Plant	Red	Red	Red	Red	Red	Red	Red
Fungi	Red	Red	Red	Red	Red	Red	White
Protist	Red	Red	Red	Red	White	White	White
Bacteria	Red	Red	Red	Red	White	White	White
Archaea	Red	Red	White	White	White	White	White

No Viral Family Present
 Viral Family Present

Figure 1.4. A presence/absence plot of viral families that infect specific host types from the various Baltimore classification groups.

Methods to better identify viral sequences

Studies of the bacterial and fungal microbiome have benefitted from the fact that all bacteria contain a 16S ribosomal sequence and all fungi contain an ITS sequence, which can be identified by sequencing of DNA. Viruses, however, contain both RNA and DNA genomes and do not have a single gene that is represented in all species. To reduce the amount of background non-viral sequences, many groups have created methods to better identify viral sequences from specific types of viruses. These solutions can be binned broadly into two categories: experimental methods designed to enrich viral sequences in a sequencing dataset and improved computational workflows designed to more sensitively detect viral sequences. The experimental methods address the issue of poor query sequences, while the improved computational workflows address the issue of alignment limitations. As illustrated below, these efforts have been successfully applied to reduce the amount of viral dark matter; however, in most cases, the methods rely on specific attributes of a specific subgroup of viruses and are not generally applicable to all viruses. Nonetheless, these types of approaches are critical to better define all components of the virome.

Experimental methods

These methods use experimental wet lab techniques to specifically enrich viral nucleic acids in a sample so that a higher proportion of viral sequence reads are present in the sequencing dataset. Because a higher percentage of the reads will be from viruses, these viruses are selectively sequenced deeper, with more reads originating from viruses. As each virus will have more reads corresponding to it, assemblers can generate longer viral contigs.

Virus Culture

Propagation of a virus in cell culture is the traditional gold standard to demonstrate a particular sequence is in fact viral in nature, even in the absence of discernable similarity to other known viruses. In terms of sequencing, viral propagation in culture increases the relative abundance of viral nucleic acid to host

nucleic acid, which ultimately can lead to improved assembly and longer contigs as alignment queries. In addition, one class of viruses for which culture is particularly useful is segmented viruses. As described previously, it can be difficult to identify all segments of a highly divergent virus by sequence analysis alone. Identifying viral segments using culture relies on the defined properties of segmented viruses, specifically that the genome of a segmented viruses is defined by the minimal number of segments necessary for viral propagation. Nucleic acids that can co-propagate with viruses but are unnecessary for viral transmission are usually defined as satellites rather than segments. Therefore, given a culture system, one could identify viral segments by performing limiting dilutions of a virus of interest and assess whether the putative segments co-propagate together. Additionally, molecular methods can be used to identify novel segments. Many segmented RNA viral taxa characteristically contain conserved 5' or 3' terminal sequences. These taxa include Bunyaviruses ⁴¹, Emaraviruses ⁴², Tenuiviruses ⁴³, Cystoviruses ⁴⁴, Rotaviruses ⁴⁵, Cileviruses ⁴⁶, and some Orthomyxoviruses ⁴⁷. Finding sequences that contain these conserved 5' or 3' motifs among multiple sequences provides strong evidence that these sequences are likely part of the same virus ^{38,39}.

Virus Like Particle (VLP) Purification

The ability to pass through 0.2 um filters has classically been a defining feature of viruses. Filtering samples through 0.45 um or 0.2 um filters enriches for virions because intact cellular organisms cannot pass through the filter. Since these filtrates can still contain nucleic acid from lysed bacteria or host cells, samples are often treated with RNAses and DNAses to further enrich the samples for viral nucleic acids, which are typically protected from the nucleases within the viral capsids whereas host nucleic acids are not. To more completely remove this nucleic acid, centrifugation through CsCl or other gradients can be performed ^{48,49}. Because viral particles are encapsidated with protein, they are denser than “naked” nucleic acid and can be separated. However, there is evidence that gradient ultracentrifugation preferentially enriches specific taxa of viruses over others ⁴⁸.

There are two major groups of viruses that cannot be enriched using this method. Giant dsDNA viruses including Mimiviruses and specific large viruses like Bacillus G Virus are too large to pass through filters. Secondly, viruses that do not exhibit an extracellular stage are likely to be missed. Viral taxa in this group tend to infect lower eukaryotes and fungi and include *Chrysoviridae*, *Hypoviridae*, *Totiviridae*, *Narnaviridae* and *Endornaviridae*. These viruses are largely transmitted vertically or by cell-cell contact, thus obviating the need for an extracellular phase. Because these viruses largely reside in the cytoplasm of eukaryotes, the viruses will generally co-segregate physically with their hosts, and not pass through a 0.45 um filter. Additionally, viruses that only intermittently exhibit an extracellular phase, such as temperate phages, can often be missed by VLP preps.

Viral tagging

Large dsDNA viruses often have long stretches of sequence containing numerous genes that do not align to any known viral genome. Because of their long length, it is often difficult to assemble a single genomic contig from a large dsDNA virus. This inability to generate a single contig results in multiple contigs assembled from the same virus, with many of these contigs lacking viral specific genes. Therefore, alignment cannot be reliably used to identify all viral derived contigs. Viral tagging is one approach that addresses this problem by capitalizing on the fact that some viruses are permeable to fluorescent dyes that bind DNA ⁷. Host cells are grown in isotopically labeled nucleotides, making the host genome labeled with heavy nucleotides. Viruses from an environmental sample can be labeled using a fluorescent dye, incubated with their host, resulting in the fluorescent viral DNA in the host cell. Fluorescent cells are then sorted after which, the DNA is extracted. The intracellular DNA is then centrifuged in a CsCl gradient to separate the light and heavy isotopically labeled DNA. The light DNA is then sequenced. Viral tagging therefore not only enriches viral DNA enabling longer genomic contigs to be assembled, but it also allows for specific phages to be associated with hosts. Currently, viral tagging has been primarily applied to bacteria.

dsRNA enrichment

All non-retroid RNA viruses use a double-stranded RNA (dsRNA) intermediate to replicate their genome. Long stretches of dsRNA are rarely made outside the context of viruses, so much so that mammalian and plant immune systems recognize it as a source of foreign nucleic acid ⁵⁰. Thus, physical enrichment of intracellular dsRNA reduces the complexity of the sample and increases the fraction of RNA virus sequences, which increases the likelihood of assembling longer contigs. Before the next generation sequencing era, intracellular dsRNA was enriched using nucleases to identify RNA viral segments from fungal and protozoal viruses ⁵¹. Other methods have also been used to enrich dsRNA, including CF11 cellulose chromatography and dsRNA antibodies ^{52,53}. Enrichment of dsRNA is particularly useful in the context of plant and fungal viruses, as many of these host organisms do not have genome sequences associated with them, and therefore their host sequences cannot be efficiently subtracted out by alignment.

Computational methods

The following methods address the second limitation in virus identification, the computational limits of sequence alignment. The common thread in these methods is that they identify specific qualities of viral sequences and use them to more specifically identify contigs as putative viruses. While none of these methods can always unequivocally identify viral sequences, they all generate a more compact list of contigs which can later be experimentally validated.

PFor

Many organisms use RNAi as a method to restrict viral infection by generating small RNAs and loading them onto the RISC complex. Because small RNAs are often generated from foreign nucleic acids, they represent a useful enrichment source of viral and sub-viral nucleic acids ^{54,55}. These sequences can then be assembled into contigs which can be subsequently aligned to viral proteins. Furthermore, these sequences can additionally be analyzed beyond alignment to identify novel viroids. As viroids contain a circular

genome, computationally identifying sequence reads that originate from circular contigs can enrich the likelihood that these reads come from a viroid. This idea is the basis for PFor⁵⁶. PFor identifies reads that are likely to be derived from a circular contig by recognizing that these reads must align to other reads at both the 5' and 3' ends. PFor removes all reads that do not fit this alignment criteria; if an individual read either does not align to any other read or only has reads that align to one terminus of its sequence, it is eliminated from the pool of reads. This process is repeated iteratively on the pool of reads until all the reads contain 5' and 3' alignments to other reads. At this point, the reads are then assembled into contigs. While these contigs cannot be definitively defined as novel viroids, they are likely enriched for viroid sequences, making them more attractive for classical experimentation. PFor and its updated version, PFor2 have identified both known and novel viroids^{57,58}.

K-mer based classification

It has been long recognized that genomes from different taxa vary in their dinucleotide composition⁵⁹⁻⁶³. This idea has been leveraged to develop classifiers that can classify dark matter based on the frequency of nucleotide oligomers, often referred to as k-mers⁶⁴⁻⁶⁸. Viral genomes are also known to have specific k-mer compositions, and these variations have previously been shown to correlate with virus host as well as Baltimore classification^{69,70}. Studies have shown that altering the dinucleotide composition of a virus can inhibit viral replication, even when no amino acid changes are made⁷¹⁻⁷⁸. Although a mechanistic understanding of the basis for k-mer biases in viruses is still largely unknown, the existence of specific viral k-mer compositions suggest that they could be exploited for taxonomic classification. Currently, there is only one published viral method, the Naïve Bayes Classifier (NBC), that incorporates viral k-mer sequences in its model, although it only includes DNA viral sequences⁷⁹⁻⁸¹. NBC takes in an input sequence and calculates a vector containing k-mer frequencies. Using a pre-computed database of k-mer frequencies of genomes from sequenced organisms, it calculates the probability of getting the input k-mer vector from each genome, and identifies bins the sequence based on whichever genome yields the highest

probability. K-mer based approaches have also been used to classify viral structural proteins based on their amino acid composition⁸². We have developed a method, DiscoVIR, suitable for classification of both DNA and RNA virus k-mer frequencies using a support vector machine (unpublished).

VirSorter

Taxonomic classification of DNA bacteriophages poses several challenges. One difficulty is that many bacteriophage genes share homology with host bacterial genes making it difficult to discern the true origin of a sequence that aligns to both reference bacteriophages and bacteria. Another challenge is that many bacteriophage defining genes, such as structural genes, share no primary sequence alignment to known phage genes in the database. VirSorter solves the lack of alignment of structural genes by constructing a specifically curated database of only bacteriophage defining protein sequences, most of which are structural genes such as “major capsid protein,” “portal,” “terminase large subunit,” “spike,” “tail,” “virion formation” or “coat”⁸³. Additionally, VirSorter identifies additional bacteriophage defining proteins by alignment of the initial derived set to publically available viromes, and includes those virome derived sequences in their database. Using these expanded sequences for bacteriophage defining sequences, VirSorter defines amino acid profile HMMs and uses these profiles to search new protein sequences against these profiles. Finally, VirSorter can identify bacteriophage sequences completely independent of alignment, scoring sequences for having bacteriophage genomic signatures, such as an enrichment for short genes and uncharacterized genes, a depletion of non-phage genes or segments of DNA that do not change the coding strand. The output of VirSorter is a confidence score that identifies contigs likely to be phage derived. VirSorter has been applied to public sequencing databases and has been successful in classifying a large proportion of dark matter as phage derived⁸⁴.

Conclusions and Future Directions

The discovery of highly divergent viruses will greatly advance our understanding of biology in the context of immunity, molecular biology, ecology and human disease. Broadening viral diversity creates

the evolutionary and genomic context to study these viral systems to understand these concepts. Here, I show how discovering highly divergent viruses can be used to expand biological understanding by using microbial viruses, specifically, the RNA bacteriophages, as an example case. RNA bacteriophages were highly underrepresented among known sequenced bacteriophages. Previously, only 16 known bacteriophages with RNA genomes were known, all of which were derived from two families, the *Leviviridae* and *Cystoviridae*³². This underrepresentation is not an accurate reflection of their importance in biology or utility, as many fundamental concepts in molecular biology have been discovered using RNA bacteriophages^{85,86}.

I address the underrepresentation of viral sequences in databases by identifying a specific underrepresented class of virus, bacteriophages with RNA genomes and systematically discovering highly divergent viruses in publically deposited sequencing data. This massive expansion of RNA bacteriophages created the context for us to ask whether there were any genes that could actively restrict RNA bacteriophages. Additionally, this expansion of RNA bacteriophages made us ask whether we could identify any novel families of RNA bacteriophages, unrelated to the known families. I then addressed the reliance on alignment based algorithms by developing a novel alignment-independent algorithm to identify viral sequences, DiscoVir. I applied DiscoVir to an authentic metagenome to aid in discovering the first segmented negative stranded RNA virus infecting a fungus.

References

- 1 Siebrasse, E. a. *et al.* Identification of MW polyomavirus, a novel polyomavirus in human stool. *Journal of virology* **86**, 10321-10326, doi:10.1128/JVI.01210-12 (2012).
- 2 Phan, T. G. *et al.* The fecal viral flora of wild rodents. *PLoS Pathogens* **7**, doi:10.1371/journal.ppat.1002218 (2011).
- 3 Tokarz, R. *et al.* Virome analysis of *Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes scapularis* ticks reveals novel highly divergent vertebrate and invertebrate viruses. *Journal of virology* **88**, 11480-11492, doi:10.1128/JVI.01858-14 (2014).
- 4 Geering, A. D. W. *et al.* Endogenous florendoviruses are major components of plant genomes and hallmarks of virus evolution. *Nature Communications* **5**, 1-11, doi:10.1038/ncomms6269 (2014).
- 5 Marzano, S.-Y. L. & Domier, L. Novel mycoviruses discovered from metatranscriptomics survey of soybean phyllosphere phytobiomes. *Virus research* **213**, 332-342, doi:10.1016/j.virusres.2015.11.002 (2015).
- 6 Holmfeldt, K. *et al.* Twelve previously unknown phage genera are ubiquitous in global oceans. *Proceedings of the National Academy of Sciences of the United States of America* **110**, 12798-12803, doi:10.1073/pnas.1305956110 (2013).
- 7 Deng, L. *et al.* Viral tagging reveals discrete populations in *Synechococcus* viral genome sequence space. *Nature*, 13459, doi:10.1038/nature13459 (2014).
- 8 Mochizuki, T. *et al.* Archaeal virus with exceptional virion architecture and the largest single-stranded DNA genome. *Proceedings of the National Academy of Sciences* **109**, 13386-13391, doi:10.1073/pnas.1203668109 (2012).
- 9 Marz, M. *et al.* Challenges in RNA Virus Bioinformatics. *Bioinformatics (Oxford, England)*, 1-7 (2014).
- 10 Fawaz, M. *et al.* Duck gut viral metagenome analysis captures snapshot of viral diversity. *Gut Pathogens* **8**, 30, doi:10.1186/s13099-016-0113-5 (2016).
- 11 Handley, S. A. *et al.* SIV Infection-Mediated Changes in Gastrointestinal Bacterial Microbiome and Virome Are Associated with Immunodeficiency and Prevented by Vaccination. *Cell Host and Microbe* **19**, 323-335, doi:10.1016/j.chom.2016.02.010 (2016).
- 12 Minot, S. *et al.* Rapid evolution of the human gut virome. *Proceedings of the National Academy of Sciences* **110**, doi:10.1073/pnas.1300833110/-/DCSupplemental.www.pnas.org/cgi/doi/10.1073/pnas.1300833110 (2013).
- 13 Reyes, A. *et al.* Gut DNA viromes of Malawian twins discordant for severe acute malnutrition. *Proceedings of the National Academy of Sciences* **112**, 201514285, doi:10.1073/pnas.1514285112 (2015).
- 14 Langmead, B. & Salzberg, S. L. Fast gapped-read alignment with Bowtie 2. *Nat Methods* **9**, 357-359, doi:10.1038/nmeth.1923 (2012).
- 15 Li, R. *et al.* SOAP2: An improved ultrafast tool for short read alignment. *Bioinformatics* **25**, 1966-1967, doi:10.1093/bioinformatics/btp336 (2009).
- 16 Li, H. & Durbin, R. Fast and accurate short read alignment with Burrows-Wheeler transform. *Bioinformatics* **25**, 1754-1760, doi:10.1093/bioinformatics/btp324 (2009).
- 17 Zhao, G. *et al.* Identification of novel viruses using VirusHunter--an automated data analysis pipeline. *PloS one* **8**, e78470, doi:10.1371/journal.pone.0078470 (2013).
- 18 Altschul, S. F., Gish, W., Miller, W., Myers, E. W. & Lipman, D. J. Basic local alignment search tool. *Journal of molecular biology* **215**, 403-410, doi:10.1016/S0022-2836(05)80360-2 (1990).
- 19 Kostic, A. D. *et al.* PathSeq: software to identify or discover microbes by deep sequencing of human tissue. *Nature biotechnology* **29**, 393-396, doi:10.1038/nbt.1868 (2011).

- 20 Lorenzi, H. A. *et al.* The Viral MetaGenome Annotation Pipeline (VMGAP): an automated tool for
the functional annotation of viral Metagenomic shotgun sequencing data. *Standards in genomic
sciences* **4**, 418-429, doi:10.4056/sigs.1694706 (2011).
- 21 Wommack, K. E. *et al.* VIROME: a standard operating procedure for analysis of viral
metagenome sequences. *Standards in genomic sciences* **6**, 427-439, doi:10.4056/sigs.2945050
(2012).
- 22 Gish, W. & States, D. J. Identification of protein coding regions by database similarity search. *Nat
Genet* **3**, 266-272, doi:10.1038/ng0393-266 (1993).
- 23 Buchfink, B., Xie, C. & Huson, D. H. Fast and sensitive protein alignment using DIAMOND.
Nature Methods **12**, 59-60, doi:10.1038/nmeth.3176 (2014).
- 24 Ye, Y., Choi, J.-H. & Tang, H. RAPSearch: a fast protein similarity search tool for short reads.
BMC Bioinformatics **12**, 159-159, doi:10.1186/1471-2105-12-159 (2011).
- 25 Yinda, C. K. *et al.* Novel highly divergent reassortant bat rotaviruses in Cameroon, without
evidence of zoonosis. *Scientific Reports* **6**, 34209, doi:10.1038/srep34209 (2016).
- 26 Greninger, A. L. & Derisi, L. Draft Genome Sequences of Leviviridae RNA Phages EC and MB
Recovered from San Francisco Wastewater. *Genome Announcements* **3**, 9-10,
doi:10.1128/genomeA.00652-15.Copyright (2015).
- 27 Finn, R. D. *et al.* The Pfam protein families database. *Nucleic acids research* **38**, D211-222,
doi:10.1093/nar/gkp985 (2010).
- 28 Finn, R. D., Clements, J. & Eddy, S. R. HMMER web server: Interactive sequence similarity
searching. *Nucleic Acids Research* **39**, 29-37, doi:10.1093/nar/gkr367 (2011).
- 29 Skewes-Cox, P., Sharpton, T. J., Pollard, K. S. & DeRisi, J. L. Profile Hidden Markov Models for
the Detection of Viruses within Metagenomic Sequence Data. *PLoS ONE* **9**, e105067-e105067,
doi:10.1371/journal.pone.0105067 (2014).
- 30 Karlsson, O. E., Larsson, J., Hayer, J., Berg, M. & Jacobson, M. The intestinal eukaryotic virome
in healthy and diarrhoeic neonatal piglets. *PLoS ONE* **11**, 1-16, doi:10.1371/journal.pone.0151481
(2016).
- 31 Kelley, L. A., Mezulis, S., Yates, C. M., Wass, M. N. & Sternberg, M. J. E. The Phyre2 web
portal for protein modeling, prediction and analysis. *Nature Protocols* **10**, 845-858,
doi:10.1038/nprot.2015-053 (2015).
- 32 Krishnamurthy, S. R., Janowski, A. B., Zhao, G., Barouch, D. & Wang, D. Hyperexpansion of
RNA Bacteriophage Diversity. *PLOS Biology* **14**, e1002409, doi:10.1371/journal.pbio.1002409
(2016).
- 33 Frey, K. G. *et al.* Bioinformatic Characterization of Mosquito Viromes within the Eastern United
States and Puerto Rico : Discovery of Novel Viruses. **12**, 1-12, doi:10.4137/EBO.S38518.TYPE
(2016).
- 34 Wu, Q., Ding, S.-W., Zhang, Y. & Zhu, S. Identification of Viruses and Viroids by Next-
Generation Sequencing and Homology-Dependent and Homology-Independent Algorithms.
Annual Review of Phytopathology **53**, 150605182533006, doi:10.1146/annurev-phyto-080614-
120030 (2014).
- 35 Mihindukulasuriya, K. a. *et al.* Nyamanini and midway viruses define a novel taxon of RNA
viruses in the order Mononegavirales. *Journal of virology* **83**, 5109-5116, doi:10.1128/JVI.02667-
08 (2009).
- 36 Liu, L. *et al.* Fungal negative-stranded RNA virus that is related to bornaviruses and nyaviruses.
Proceedings of the National Academy of Sciences of the United States of America **111**, 1-6,
doi:10.1073/pnas.1401786111 (2014).
- 37 Dutilh, B. E. *et al.* A highly abundant bacteriophage discovered in the unknown sequences of
human faecal metagenomes. *Nature Communications* **5**, 1-11, doi:10.1038/ncomms5498 (2014).

- 38 Presti, R. M. *et al.* Quarantil, Johnston Atoll, and Lake Chad viruses are novel members of the family Orthomyxoviridae. *Journal of virology* **83**, 11599-11606, doi:10.1128/JVI.00677-09 (2009).
- 39 Bacharach, E. *et al.* Characterization of a Novel Orthomyxo-like Virus Causing Mass Die-Offs of Tilapia. *mBio* **7**, e00431-00416, doi:10.1128/mBio.00431-16 (2016).
- 40 Bolduc, B. *et al.* Identification of Novel Positive-Strand RNA Viruses by Metagenomic Analysis of Archaea-Dominated Yellowstone Hot Springs. *Journal of Virology* **86**, 5562-5573, doi:10.1128/JVI.07196-11 (2012).
- 41 Schmaljohn, C. S. & Dalrymple, J. M. Analysis of Hantaan virus RNA: evidence for a new genus of bunyaviridae. *Virology* **131**, 482-491, doi:10.1016/0042-6822(83)90514-7 (1983).
- 42 Mielke, N. & Muehlbach, H.-P. A novel, multipartite, negative-strand RNA virus is associated with the ringspot disease of European mountain ash (*Sorbus aucuparia* L.). *The Journal of general virology* **88**, 1337-1346, doi:10.1099/vir.0.82715-0 (2007).
- 43 Takahashi, M., Toriyama, S., Kikuchi, Y., Hayakawa, T. & Ishihama, a. Complementarity between the 5'- and 3'-terminal sequences of rice stripe virus RNAs. *The Journal of general virology* **71** (Pt 12, 2817-2821 (1990).
- 44 Mindich, L. *et al.* Nucleotide sequence of the large double-stranded RNA segment of bacteriophage phi 6: genes specifying the viral replicase and transcriptase. *Journal of virology* **62**, 1180-1185 (1988).
- 45 Imai, M., Akatani, K., Ikegami, N. & Furuichi, Y. Capped and conserved terminal structures in human rotavirus genome double-stranded RNA segments. *Journal of virology* **47**, 125-136 (1983).
- 46 Locali-Fabris, E. C. *et al.* Complete nucleotide sequence, genomic organization and phylogenetic analysis of Citrus leprosis virus cytoplasmic type. *Journal of General Virology* **87**, 2721-2729, doi:10.1099/vir.0.82038-0 (2006).
- 47 Leahy, M. B., Dessens, J. T., Weber, F., Kochs, G. & Nuttall, P. A. The fourth genus in the Orthomyxoviridae: Sequence analyses of two Thogoto virus polymerase proteins and comparison with influenza viruses. *Virus Research* **50**, 215-224, doi:10.1016/S0168-1702(97)00072-5 (1997).
- 48 Kleiner, M., Hooper, L. V. & Duerkop, B. A. Evaluation of methods to purify virus-like particles for metagenomic sequencing of intestinal viromes. *BMC genomics* **16**, 7-7, doi:10.1186/s12864-014-1207-4 (2015).
- 49 Minot, S., Grunberg, S., Wu, G. D., Lewis, J. D. & Bushman, F. D. Hypervariable loci in the human gut virome. *Proceedings of the National Academy of Sciences* **109**, 3962-3966, doi:10.1073/pnas.1119061109 (2012).
- 50 Iwasaki, A. A virological view of innate immune recognition. *Annual review of microbiology* **66**, 177-196, doi:10.1146/annurev-micro-092611-150203 (2012).
- 51 Preisig, O., Moleleki, N., Smit, W. a., Wingfield, B. D. & Wingfield, M. J. A novel RNA mycovirus in a hypovirulent isolate of the plant pathogen *Diaporthe ambigua*. *The Journal of general virology* **81**, 3107-3114 (2000).
- 52 Decker, Carolyn J. & Parker, R. Analysis of Double-Stranded RNA from Microbial Communities Identifies Double-Stranded RNA Virus-like Elements. *Cell Reports* **7**, 898-906, doi:10.1016/j.celrep.2014.03.049 (2014).
- 53 Nerva, L. *et al.* Multiple approaches for the detection and characterization of viral and plasmid symbionts from a collection of marine fungi. *Virus research*, doi:10.1016/j.virusres.2015.10.028 (2015).
- 54 Kreuze, J. F. *et al.* Complete viral genome sequence and discovery of novel viruses by deep sequencing of small RNAs: A generic method for diagnosis, discovery and sequencing of viruses. *Virology* **388**, 1-7, doi:10.1016/j.virol.2009.03.024 (2009).

- 55 Giampetruzzi, A. *et al.* A new grapevine virus discovered by deep sequencing of virus- and viroid-derived small RNAs in Cv Pinot gris. *Virus Research* **163**, 262-268, doi:10.1016/j.virusres.2011.10.010 (2012).
- 56 Wu, Q. *et al.* Homology-independent discovery of replicating pathogenic circular RNAs by deep sequencing and a new computational algorithm. *Proceedings of the National Academy of Sciences of the United States of America* **109**, 3938-3943, doi:10.1073/pnas.1117815109 (2012).
- 57 Wu, Q. *et al.* Homology-independent discovery of replicating pathogenic circular RNAs by deep sequencing and a new computational algorithm. *Proceedings of the National Academy of Sciences* **109**, 3938-3943, doi:10.1073/pnas.1117815109 (2012).
- 58 Zhang, Z. *et al.* Discovery of Replicating Circular RNAs by RNA-Seq and Computational Algorithms. *PLoS Pathogens* **10**, e1004553-e1004553, doi:10.1371/journal.ppat.1004553 (2014).
- 59 Gast, F. U. & Spieker, R. L. Viroids proper can be distinguished from hammerhead viroids and satellite RNAs through their dinucleotide composition. *Archives of virology* **141**, 1775-1783 (1996).
- 60 Karlin, S. & Mrázek, J. Compositional differences within and between eukaryotic genomes. *Proceedings of the National Academy of Sciences of the United States of America* **94**, 10227-10232 (1997).
- 61 Duret, L. & Galtier, N. The covariation between TpA deficiency, CpG deficiency, and G+C content of human isochores is due to a mathematical artifact. *Molecular biology and evolution* **17**, 1620-1625 (2000).
- 62 Knight, R. D., Freeland, S. J. & Landweber, L. F. A simple model based on mutation and selection explains trends in codon and amino-acid usage and GC composition within and across genomes. *Genome biology* **2**, RESEARCH0010-RESEARCH0010 (2001).
- 63 Blaisdell, B. E. A measure of the similarity of sets of sequences not requiring sequence alignment. *Proceedings of the National Academy of Sciences of the United States of America* **83**, 5155-5159, doi:10.1073/pnas.83.14.5155 (1986).
- 64 Brady, A. & Salzberg, S. L. Phymm and PhymmBL: metagenomic phylogenetic classification with interpolated Markov models. *Nature methods* **6**, 673-676, doi:10.1038/nmeth.1358 (2009).
- 65 Nalbantoglu, O. U., Way, S. F., Hinrichs, S. H. & Sayood, K. RAIPhy: phylogenetic classification of metagenomics samples using iterative refinement of relative abundance index profiles. *BMC bioinformatics* **12**, 41, doi:10.1186/1471-2105-12-41 (2011).
- 66 Parks, D. H., MacDonald, N. J. & Beiko, R. G. Classifying short genomic fragments from novel lineages using composition and homology. *BMC bioinformatics* **12**, 328, doi:10.1186/1471-2105-12-328 (2011).
- 67 Diaz, N. N., Krause, L., Goesmann, A., Niehaus, K. & Nattkemper, T. W. TACOA: taxonomic classification of environmental genomic fragments using a kernelized nearest neighbor approach. *BMC bioinformatics* **10**, 56, doi:10.1186/1471-2105-10-56 (2009).
- 68 Gregor, I., Dröge, J., Schirmer, M., Quince, C. & McHardy, A. C. PhyloPythiaS+ : a self-training method for the rapid reconstruction of low-ranking taxonomic bins from metagenomes. *PeerJ* **4**, e1603-e1603, doi:10.7717/peerj.1603 (2016).
- 69 Kapoor, a., Simmonds, P., Lipkin, W. I., Zaidi, S. & Delwart, E. Use of nucleotide composition analysis to infer hosts for three novel picorna-like viruses. *Journal of virology* **84**, 10322-10328, doi:10.1128/JVI.00601-10 (2010).
- 70 Simmonds, P., Xia, W., Baillie, J. K. & McKinnon, K. Modelling mutational and selection pressures on dinucleotides in eukaryotic phyla – selection against CpG and UpA in cytoplasmically expressed RNA and in RNA viruses. *BMC Genomics* **14**, 1-1, doi:10.1186/1471-2164-14-610 (2013).
- 71 Cheng, X. *et al.* CpG usage in RNA viruses: data and hypotheses. *PloS one* **8**, e74109-e74109, doi:10.1371/journal.pone.0074109 (2013).

- 72 Atkinson, N. J., Witteveldt, J., Evans, D. J. & Simmonds, P. The influence of CpG and UpA dinucleotide frequencies on RNA virus replication and characterization of the innate cellular pathways underlying virus attenuation and enhanced replication. *Nucleic Acids Research* **42**, 4527-4545, doi:10.1093/nar/gku075 (2014).
- 73 Krinner, S., Heitzer, A. P., Diermeier, S. D., Obermeier, I. & La, G. CpG domains downstream of TSSs promote high levels of gene expression. 1-14, doi:10.1093/nar/gkt1358 (2014).
- 74 Tulloch, F., Atkinson, N. J., Evans, D. J., Ryan, M. D. & Simmonds, P. RNA virus attenuation by codon pair deoptimisation is an artefact of increases in CpG / UpA dinucleotide frequencies. 1-15, doi:10.7554/eLife.04531 (2014).
- 75 Gaunt, E. *et al.* Elevation of CpG frequencies in influenza a genome attenuates pathogenicity but enhances host response to infection. *eLife* **5**, 1-19, doi:10.7554/eLife.12735 (2016).
- 76 Coleman, J. R. *et al.* Virus attenuation by genome-scale changes in codon pair bias. *Science (New York, N.Y.)* **320**, 1784-1787, doi:10.1126/science.1155761 (2008).
- 77 Mueller, S. *et al.* Live attenuated influenza virus vaccines by computer-aided rational design. *Nature biotechnology* **28**, 723-726, doi:10.1038/nbt.1636 (2010).
- 78 Shen, S. H. *et al.* Large-scale recoding of an arbovirus genome to rebalance its insect versus mammalian preference. *Proceedings of the National Academy of Sciences* **112**, 201502864-201502864, doi:10.1073/pnas.1502864112 (2015).
- 79 Rosen, G., Garbarine, E., Caseiro, D., Polikar, R. & Sokhansanj, B. Metagenome fragment classification using N-mer frequency profiles. *Advances in bioinformatics* **2008**, 205969, doi:10.1155/2008/205969 (2008).
- 80 Rosen, G. L., Reichenberger, E. R. & Rosenfeld, A. M. NBC: the Naive Bayes Classification tool webserver for taxonomic classification of metagenomic reads. *Bioinformatics (Oxford, England)* **27**, 127-129, doi:10.1093/bioinformatics/btq619 (2011).
- 81 Rosen, G. L. & Lim, T. Y. NBC update: The addition of viral and fungal databases to the Naive Bayes classification tool. *BMC research notes* **5**, 81, doi:10.1186/1756-0500-5-81 (2012).
- 82 Seguritan, V. *et al.* Artificial Neural Networks Trained to Detect Viral and Phage Structural Proteins. *PLoS Computational Biology* **8**, e1002657-e1002657, doi:10.1371/journal.pcbi.1002657 (2012).
- 83 Roux, S., Enault, F., Hurwitz, B. L. & Sullivan, M. B. VirSorter: mining viral signal from microbial genomic data. *PeerJ* **3**, e985, doi:10.7717/peerj.985 (2015).
- 84 Roux, S., Hallam, S. J., Woyke, T. & Sullivan, M. B. Viral dark matter and virus-host interactions resolved from publicly available microbial genomes. *eLife* **4**, e08490-e08490, doi:10.7554/eLife.08490 (2015).
- 85 Steitz, J. A. Polypeptide chain initiation: nucleotide sequences of the three ribosomal binding sites in bacteriophage R17 RNA. *Nature* **224**, 957-964 (1969).
- 86 Turner, P. E., Chao, L. & Vale, U. D. Prisoner 's dilemma in an RNA virus. **398**, 441-443 (1999).

2. Hyperexpansion of RNA Bacteriophage Diversity

This work is published in PLoS Biology (2016), 14(3): e1002409

Siddharth R. Krishnamurthy¹, Andrew B. Janowski¹, Guoyan Zhao¹, Dan Barouch², David Wang^{1*}

¹ Departments of Molecular Microbiology and Pathology and Immunology, Washington University School of Medicine, St. Louis, Missouri, United States of America,

² Center for Virology and Vaccine Research, Beth Israel Deaconess Medical Center, Boston, Massachusetts, United States of America, and Ragon Institute of MGH, MIT, and Harvard, Boston, Massachusetts, United States of America

Abstract

Bacteriophage modulation of microbial populations impacts critical processes in ocean, soil, and animal ecosystems. However, the role of bacteriophages with RNA genomes (RNA bacteriophages) in these processes is poorly understood, in part because of the limited number of known RNA bacteriophage species. Here, we identify partial genome sequences of 122 RNA bacteriophage phylotypes that are highly divergent from each other and from previously described RNA bacteriophages. These novel RNA bacteriophage sequences were present in samples collected from a range of ecological niches worldwide, including invertebrates and extreme microbial sediment, demonstrating that they are more widely distributed than previously recognized. Genomic analyses of these novel bacteriophages yielded multiple novel genome organizations. Furthermore, one RNA bacteriophage was detected in the transcriptome of a pure culture of *Streptomyces avermitilis*, suggesting for the first time that the known tropism of RNA bacteriophages may include gram-positive bacteria. Finally, reverse transcription PCR (RT-PCR)-based screening for two specific RNA bacteriophages in stool samples from a longitudinal cohort of macaques suggested that they are generally acutely present rather than persistent.

Author Summary

Bacteriophages (viruses that infect bacteria) can alter biological processes in numerous ecosystems. While there are numerous studies describing the role of bacteriophages with DNA genomes in these processes, the role of bacteriophages with RNA genomes (RNA

bacteriophages) is poorly understood. This gap in knowledge is in part because of the limited diversity of known RNA bacteriophages. Here, we begin to address the question by identifying 122 novel RNA bacteriophage partial genome sequences present in metagenomic datasets that are highly divergent from each other and previously described RNA bacteriophages.

Additionally, many of these sequences contained novel properties, including novel genes, segmentation, and host range, expanding the frontiers of RNA bacteriophage genomics, evolution, and tropism. These novel RNA bacteriophage sequences were globally distributed from numerous ecological niches, including animal-associated and environmental habitats. These findings will facilitate our understanding of the role of the RNA bacteriophage in microbial communities. Furthermore, there are likely many more unrecognized RNA bacteriophages that remain to be discovered.

Introduction

Bacteria play key roles in metabolic and immunological processes; however, at this time many of the factors that define the composition of a given microbial population are still unknown¹⁻⁴. Bacteriophages are abundant in many environments, and because they can lyse bacteria or transfer genes, bacteriophages likely play a role in shaping the specific composition of microbial populations. The currently recognized bacteriophages employ highly diverse lifestyles, especially in regards to host range specificity and potential to induce cell lysis, and therefore, bacteriophages from different taxa may uniquely impact the microbial composition of a given

niche^{5,6}. One particularly understudied area of bacteriophage diversity is that of RNA bacteriophages. While many recent studies have aimed to characterize DNA bacteriophage communities in microbial populations, the RNA bacteriophage component of these communities is poorly defined⁷⁻¹⁰.

DNA bacteriophages are currently classified by the International Committee for the Taxonomy of Viruses (ICTV) into eight separate families with a total of 494 species, 55 single-stranded DNA (ssDNA), and 439 double-stranded DNA (dsDNA) bacteriophage species. These species derive from a diverse group of host bacteria; additionally, there are over 1,000 genomic sequences of DNA bacteriophage species in GenBank. By contrast, according to the latest (2014) report of the ICTV, only two official families of RNA bacteriophages are recognized: the single-stranded RNA (ssRNA) bacteriophage family *Leviviridae* that includes four recognized species (Enterobacteria phage Q β , Enterobacteria phage F1, Enterobacteria phage MS2, and Enterobacteria phage GA) and the segmented, double-stranded RNA (dsRNA) family *Cystoviridae* that contains a single recognized species (Pseudomonas phage ϕ 6)^{11,12}. There are complete sequences of 11 ssRNA and five dsRNA bacteriophages in the GenBank “Genomes” database as of 20 October 2015, inclusive of the five ICTV-recognized RNA bacteriophage species. In contrast to the DNA bacteriophages, in which bacteriophages have been characterized from a variety of bacterial phyla, all 16 of these bacteriophages are thought to infect hosts within the phylum Proteobacteria, with 15 that infect hosts within the class γ -proteobacteria. In addition, three highly divergent, sewage-derived ssRNA bacteriophage genomes, with unknown host tropisms, were recently deposited in Genbank¹³. For the analyses in this paper, we will refer to these 14 ssRNA bacteriophage sequences and five dsRNA bacteriophages sequences as the “reference RNA bacteriophages.” For some of these RNA bacteriophages, there are additional

partial and/or full genomic sequences of closely related variants (share > 66% nucleotide identity to the reference sequences) also available in Genbank.

Bacteriophage identification has historically relied on culture-based methods¹⁴⁻¹⁸. Given that the majority of bacterial species cannot be cultured in the laboratory, alternative culture-independent methods are necessary to describe bacteriophage diversity¹⁹. In recent years, metagenomic sequencing has been applied to define bacteriophage populations in the human gut²⁰⁻²⁵, skin²⁶, serum²⁷, and in the environment⁷. Additionally, computational mining of metagenomic datasets has been valuable for identifying additional novel taxa of DNA bacteriophages^{28,29}. However, the vast majority of these studies focused on sequencing and analysis of DNA only and therefore could not evaluate known or novel RNA bacteriophages that may be present. Of the studies that did examine RNA viruses in the environment, only one recent metagenomic study of sewage reported the presence of two novel RNA bacteriophages related to leviviruses¹³.

Here, by mining multiple metagenomic datasets that were generated such that RNA could be evaluated, we identify partial genomes of over 120 highly diverse RNA bacteriophage phylotypes that are highly divergent from each other and all of the known RNA bacteriophage genomes. This expansive diversity enabled us to identify new dimensions of RNA bacteriophage biology, including bacteriophages with novel genome organizations, numerous open reading frames (ORFs) that contain novel genes with no detectable homology to known bacteriophage genes, presence in novel ecological niches, and the first data in support of a RNA bacteriophage infection of a gram-positive bacterium. We additionally assess the prevalence of two novel RNA bacteriophages in a cohort of macaques, presenting the first description of the ecological dynamics of these novel RNA bacteriophages. Our results critically illuminate an unexamined

dimension of molecular and ecological bacteriophage diversity and fundamentally establish a necessary framework that enables a more accurate dissection of RNA bacteriophage modulation of microbial populations.

Results and Discussion

Identification of RNA Bacteriophage Sequences in Local Metagenomic Datasets

To detect RNA bacteriophages, we initially queried multiple metagenomic nucleotide sequence datasets with protein sequences from the known leviviruses and cystoviruses. We focused on datasets generated by our laboratory that contained cDNA sequences derived from RNA in the original material and that represented ecological niches known to support DNA bacteriophages, such as the vertebrate gastrointestinal tract and sewage. Cystovirus protein queries yielded no significant alignments (e-value $< 10^{-4}$). In contrast, multiple nucleotide sequences in datasets from stool-associated and sewage specimens were identified that, following translation to amino acid sequences, aligned to leviviral proteins. The four studies of relevance, which were previously generated by our laboratory, included a study of raw sewage³⁰, two distinct studies of simian immunodeficiency virus (SIV) infection in nonhuman primates^{31,32}, and a study of astrovirus infection in mice. Any single dataset that had at least ten sequence reads that yielded significant alignments (e-value $< 10^{-4}$) was selected for assembly. Using a National Center for Biotechnology Information (NCBI) conserved-domain search (e-value $< 10^{-3}$) or Phyre2 (confidence $> 90\%$), partial genomes of RNA bacteriophage phylotypes were defined as any assembled sequence greater than 750 nucleotides in length that contained a translated frame with a recognizable RNA bacteriophage-specific domain, such as a

bacteriophage-specific RNA-dependent RNA polymerase (RdRp), capsid, maturation protein, or packaging nucleoside triphosphatase (NTPase)^{33,34}.

In order to focus our analyses on truly unique RNA bacteriophage phylotypes, any partial genomes that shared > 70% nucleotide identity in either the RdRp or the maturation gene were defined as belonging to a single phylotype. The longest partial genome for a given phylotype was selected as the representative sequence for that phylotype in all downstream analyses. By these criteria, partial genomes of 20 unique RNA bacteriophage phylotypes were identified in 17 distinct specimens. Five partial genomes were assembled from metagenomic data from sewage specimens, 14 were from rhesus macaque stool data, and one was from mouse stool data. Additional partial genomes that shared 85%–97% nucleotide identity to these 20 unique partial genomes were also identified in multiple other specimens in these studies, but they did not represent novel phylotypes by our criteria and therefore were not analyzed further. Based on the sequence diversity of each of these assembled partial genomes within a single phylotype, we believe it is unlikely that these RNA bacteriophages originate from laboratory contamination. The 20 unique bacteriophage phylotypes were sequentially named based on whether it was identified from an environmental or animal specimen, followed by a two-letter descriptor of the ecological niche.

Experimental Confirmation of Partial Genome Assembly and 3' Termini

To confirm the partial genome assemblies, the eight longest partial genomes (range 3.5–5.0 kb) out of the 20 identified were experimentally validated by generating multiple overlapping reverse transcription PCR (RT-PCR) amplicons followed by Sanger sequencing. The average

length of the amplicons was ~1.8 kb. In addition, the 3' ends of AVE000, AVE001, and AVE003 were extended using rapid amplification of cDNA ends (RACE).

Table 2.1: List of novel ssRNA phage artial genomes

Phage	Partial Genome Length	Phage Source	Geographic Location	Nucleotide Database	Accession Number	Sequence confirmed by PCR	Amino Acid Identity to Closest Levivirus	Closest Known Leviviral Member	ssRNA Phage Maturation Domain (mat)	ssRNA Phage Coat Domain (Levi_Coat)	MS2 Lysin Domain (Lys)	ssRNA Phage Replicase Domain (rep)
AIN000	3675	Insect Pool	Hubei, China	SRA	SRR1745803	No	No	Enterobacteria C-1	X	X		X
AIN001	3635	Insect Pool	Hubei, China	SRA	SRR1745803	No	No	Enterobacteria QB	X			X
AIN002	3846	Insect Pool	Hubei, China	SRA	SRR1745803	No	No	Enterobacteria C-1	X	X		X
AIN003	3929	Insect Pool	Hubei, China	SRA	SRR1745803	No	No	Enterobacteria Hga1	X	X		X
AIN004	1209	Crab and Barnacle Pools	Zhejiang, China	SRA	SRR1745809	No	No	Enterobacteria F1				X
AIN005	924	Millipedes	Hubei, China	SRA	SRR1745810	No	No	Caulobacter phiCb5				X
AIN006	1032	Stylyssa carteri sponge	Thuwal, Saudi Arabia	SRA	SRR1038495	No	No	Enterobacteria BZ13	X			
AIN007	1684	Stylyssa carteri sponge	Thuwal, Saudi Arabia	SRA	SRR1038495	No	No	Enterobacteria Hga1				X
AIN008	1054	Insect Pool	Hubei, China	SRA	SRR1745803	No	No	Caulobacter phiCb5				X
AIN009	832	Crab and Barnacle Pools	Zhejiang, China	SRA	SRR1745809	No	No	Enterobacteria M11				X
AIN010	1647	Insect Pool	Hubei, China	SRA	SRR1745803	No	No	Enterobacteria C-1				X
AVE000	4977	Primate Stool	Boston, USA	ENA	PRJEB9503	Yes	Yes	Caulobacter phiCb5	X			X
AVE001	5022	Primate Stool	Boston, USA	ENA	PRJEB9503	Yes	Yes	Pseudomonas PP7	X			X
AVE002	4220	Primate Stool	Boston, USA	ENA	PRJEB9503	Yes	Yes	Enterobacteria F1	X			X
AVE003	3957	Murine Stool	Saint Louis, USA	SRA	PRJNA291303	Yes	Yes	Enterobacteria C-1	X			X
AVE004	3776	Primate Stool	New Orleans, USA	ENA	PRJEB9503	Yes	Yes	Pseudomonas PRR1	X			X
AVE005	3709	Primate Stool	Boston, USA	ENA	PRJEB9503	Yes	Yes	Enterobacteria SP	X			X
AVE006	3609	Primate Stool	New Orleans, USA	ENA	PRJEB9503	Yes	Yes	Enterobacteria M11	X			X
AVE007	3580	Primate Stool	Boston, USA	ENA	PRJEB9503	Yes	Yes	Pseudomonas PRR1	X			X
AVE008	2565	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria QB				X
AVE009	2094	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria M	X			
AVE010	1753	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria F1	X			
AVE011	1422	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria M	X			
AVE012	1053	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria F1	X			
AVE013	946	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria QB				X
AVE014	798	Primate Stool	Boston, USA	ENA	PRJEB9503	No	No	Enterobacteria fr				X
AVE015	4385	Grass Carp Intestine	Unknown	SRA	DRR013899	No	No	Enterobacteria BZ13	X			X
AVE016	4198	EPEC Associated Feces	Unknown	SRA	SRR901903	No	No	Enterobacteria M	X			X
AVE017	3483	Grass Carp Intestine	Unknown	SRA	DRR013891	No	No	Enterobacteria BZ13	X	X	X	X
AVE018	3746	Cow Rumen	Beijing, China	SRA	SRR1604866	No	No	Enterobacteria F1				X
AVE019	3737	Cow Rumen	Beijing, China	SRA	SRR594642	No	No	Enterobacteria QB	X			X
AVE020	4729	Cow Rumen	Beijing, China	SRA	SRR594654	No	No	Enterobacteria F1	X			X
AVE021	3362	Cow Rumen	Beijing, China	SRA	SRR1604865	No	No	Enterobacteria QB	X			X
AVE022	3124	Cow Rumen	Beijing, China	SRA	SRR1604865	No	No	Pseudomonas PRR1	X			X
AVE023	3023	Cow Rumen	Beijing, China	SRA	SRR1604865	No	No	Enterobacteria M11				X

AVE024	2663	Cow Rumens	Beijing, China	SRA	SRR1604865	No	No	Enterobacteria QB					X
AVE025	1925	Cow Rumens	Beijing, China	SRA	SRR594642	No	No	Pseudomonas PRR1					X
AVE026	1727	Cow Rumens	Beijing, China	SRA	SRR1604866	No	No	Enterobacteria F1	X				
AVE027	1132	Grass Carp Intestine	Unknown	SRA	DRR013891	No	No	Pseudomonas PRR1					X
AVE028	798	Cow Rumens	Beijing, China	SRA	SRR594670	No	No	Enterobacteria M					X
AVE029	1591	Wild Shrew Feces	Mpungu, Zambia	SRA	DRR023333	No	No	Enterobacteria BZ13					X
AVE030	987	Cow Rumens	Beijing, China	SRA	SRR1604865	No	No	Enterobacteria F1	X				
AVE031	965	Cow Rumens	Beijing, China	SRA	SRR1604865	No	No	Enterobacteria F1	X				
AVE032	965	Cow Rumens	Beijing, China	SRA	SRR1604865	No	No	Enterobacteria QB					X
AVE033	1818	Cow Rumens	Beijing, China	SRA	SRR1604866	No	No	Caulobacter phiCb5					X
AVE034	866	Cow Rumens	Beijing, China	SRA	SRR1604866	No	No	Enterobacteria SP					X
AVE035	811	Cow Rumens	Beijing, China	SRA	SRR1604866	No	No	Enterobacteria M					X
AVE036	769	Cow Rumens	Beijing, China	SRA	SRR1604866	No	No	Enterobacteria F1					X
AVE037	1163	Nasopharyngeal Viromes	Unknown	SRA	SRR466446	No	No	Enterobacteria C-1	X				
AVE038	1350	Nasopharyngeal Viromes	Unknown	SRA	SRR466446	No	No	Enterobacteria C-1					X
AVE039	2469	Cow Rumens	Beijing, China	SRA	SRR594642	No	No	Enterobacteria QB	X				
EMM000	2478	Microbial Mat	Rennes, France	SRA	ERR435911	No	No	Pseudomonas PRR1					X
EMM001	1193	Microbial Mat	Rennes, France	SRA	ERR435911	No	No	Enterobacteria SP	X				
EMM002	1062	Microbial Mat	Rennes, France	SRA	ERR435911	No	No	Enterobacteria M11					X
EMM003	976	Microbial Mat	USA	SRA	SRR1283110	No	No	Enterobacteria QB					X
EMS000	2751	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Enterobacteria SP					X
EMS001	3229	Sulfur Spring Sediment	Mountain View, USA	SRA	SRR064197	No	No	Enterobacteria M11					X
EMS002	2572	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Enterobacteria Hgal1	X				X
EMS003	2391	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Enterobacteria QB					X
EMS004	1980	Sediment	Wadden Sea	SRA	SRR2012732	No	No	Enterobacteria QB					X
EMS005	1750	Sediment	Wadden Sea	SRA	SRR2012732	No	No	Enterobacteria M	X				
EMS006	1679	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Enterobacteria F1					X
EMS007	1535	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Caulobacter phiCb5	X				
EMS008	1313	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Pseudomonas PP7					X
EMS009	1221	Sulfur Spring Sediment	Mountain View, USA	SRA	SRR064284	No	No	Caulobacter phiCb5					X
EMS010	1218	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Pseudomonas PRR1	X				
EMS011	1161	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Enterobacteria M11	X				
EMS012	1109	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Pseudomonas PRR1					X
EMS014	3843	Sulfur Spring Sediment	Mountain View, USA	SRA	SRR064197	No	No	Enterobacteria Hgal1	X		X		X
EMS016	912	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Caulobacter phiCb5					X
EMS017	880	Benthic Cold Seep Sediment	Barbados	SRA	SRR1822316	No	No	Enterobacteria SP	X				
EOC000	3303	Cyanobacterial Mat	Champs-sur-Marne, France	SRA	SRR1283306	No	No	Enterobacteria QB	X				X
EOC001	1670	Marine Environment	Baltic Sea	SRA	SRR072888	No	No	Pseudomonas PRR1					X
EOC002	1285	Plume	Amazon River	SRA	SRR1199286	No	No	Enterobacteria M					X
EOC004	1344	Ocean	West Mediterranean Sea	SRA	ERR550396	No	No	Enterobacteria M	X				
EOC005	1435	Watershed	British Columbia, Canada	SRA	SRR2089023	No	No	Enterobacteria BZ13	X				
EOC006	1037	Watershed	British Columbia, Canada	SRA	SRR2089023	No	No	Enterobacteria MS2	X				

E0C007	976	Watershed	British Columbia, Canada	SRA	SRR2089023	No	No	Enterobacteria MS2					X
ESE000	3426	Sewage	Pittsburgh, USA	SRA	SRR315458	No	No	Enterobacteria Hga1	X				X
ESE001	1862	Sewage	Pittsburgh, USA	SRA	SRR315458	No	No	Enterobacteria F1	X				
ESE002	1451	Sewage	Pittsburgh, USA	SRA	SRR315458	No	No	Acinetobacter Phage AP205	X				
ESE003	1366	Sewage	Barcelona, Spain	SRA	SRR315457	No	No	Enterobacteria MS2					X
ESE004	1290	Sewage	Pittsburgh, USA	SRA	SRR315458	No	No	Enterobacteria C-1	X				
ESE005	4407	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1611147	No	No	Pseudomonas PRR1	X				X
ESE006	3469	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1611147	No	No	Pseudomonas PRR1	X				X
ESE007	3294	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1427729	No	No	Pseudomonas PRR1	X	X			X
ESE008	4187	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1611150	No	No	Caulobacter phiCb5	X				X
ESE009	1917	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1046681	No	No	Enterobacteria SP					X
ESE010	1852	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1611150	No	No	Enterobacteria M	X				X
ESE011	1598	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1611150	No	No	Enterobacteria F1					X
ESE012	1550	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1611147	No	No	Enterobacteria MS2					X
ESE013	950	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1046681	No	No	Enterobacteria C-1					X
ESE014	896	Luxemburg Sewage	Schifflange, Luxemburg	SRA	SRR1046681	No	No	Caulobacter phiCb5					X
ESE015	3805	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Caulobacter phiCb5	X				X
ESE016	3692	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Caulobacter phiCb5					X
ESE017	3604	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria MS2	X				X
ESE018	3502	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria fr	X				X
ESE019	3608	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB	X				X
ESE020	3727	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria F1	X				X
ESE021	3547	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB	X				X
ESE022	2915	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Caulobacter phiCb5					X
ESE023	3666	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB	X				X
ESE024	2671	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB	X				X
ESE025	2383	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria F1					X
ESE026	2128	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Caulobacter phiCb5	X				
ESE027	1851	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria M11					X
ESE028	1635	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Caulobacter phiCb5					X
ESE029	3655	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria C-1	X				X
ESE030	1789	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria M	X				
ESE031	914	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB					X
ESE032	903	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Pseudomonas PP7					X
ESE033	951	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria fr					X
ESE034	1433	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB					X
ESE035	755	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB					X
ESE036	1464	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria MS2					X
ESE037	1224	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria Hga1	X				
ESE038	1000	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB					X
ESE039	796	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria MS2	X				
ESE040	1012	Ulipandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB					X

ESE041	1877	Ulpandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria QB	X				
ESE042	1431	Ulpandan Sewage	Singapore	SRA	SRR1027978	No	No	Enterobacteria BZ13	X				
ESE043	1272	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1427729	No	No	Enterobacteria fr	X				
ESE044	1135	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1427729	No	No	Enterobacteria BZ13					X
ESE045	1731	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1427729	No	No	Enterobacteria M11					X
ESE046	1703	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1427729	No	No	Enterobacteria M12	X	X			
ESE048	1677	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1544599	No	No	Enterobacteria F1					X
ESE049	1067	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1544599	No	No	Enterobacteria C-1	X				
ESE050	752	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1544599	No	No	Acinetobacter AP205					X
ESE051	1147	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611147	No	No	Enterobacteria F1	X				
ESE052	915	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611147	No	No	Enterobacteria QB					X
ESE053	1192	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611147	No	No	Caulobacter phiCb5					X
ESE054	818	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611147	No	No	Enterobacteria BZ13	X				
ESE055	764	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611150	No	No	Caulobacter phiCb5					X
ESE056	1301	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611150	No	No	Enterobacteria MS2	X				
ESE057	984	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611150	No	No	Enterobacteria Hga11					X
ESE058	3620	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611150	No	No	Enterobacteria Hga11	X				X
ESE047	971	Luxemburg Sewage	Schlifflange, Luxemburg	SRA	SRR1611150	No	No	Enterobacteria F1	X				
ES0000	4110	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Caulobacter phiCb5	X				X
ES0001	3968	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Caulobacter phiCb5	X				X
ES0002	3819	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Caulobacter phiCb5	X				X
ES0003	3679	Anoxic Bulk Soil of Rice Paddy	Vercelli, Italy	SRA	SRR1013758	No	No	Enterobacteria M11	X				X
ES0004	1662	Arctic Peat Soil	Svalbard	SRA	SRR1509498	No	No	Pseudomonas PRR1					X
ES0005	874	Anoxic Bulk Soil of Rice Paddy	Vercelli, Italy	SRA	SRR1013758	No	No	Enterobacteria fr					X
ES0006	831	Anoxic Bulk Soil of Rice Paddy	Vercelli, Italy	SRA	SRR1013758	No	No	Pseudomonas PRR1	X				
ES0007	1301	Anoxic Bulk Soil of Rice Paddy	Vercelli, Italy	SRA	SRR1013758	No	No	Enterobacteria QB	X				
ES0008	1760	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Caulobacter phiCb5					X
ES0009	1514	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Caulobacter phiCb5					X
ES0010	3612	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Enterobacteria SP	X				X
ES0011	1284	Arctic Peat Soil	Svalbard	SRA	SRR1509497	No	No	Enterobacteria SP					X
ES0012	1198	Arctic Peat Soil	Svalbard	SRA	SRR1509498	No	No	Enterobacteria F1	X				
ES0013	988	Arctic Peat Soil	Svalbard	SRA	SRR1509498	No	No	Enterobacteria MS2					X
ES0014	1484	Arctic Peat Soil	Svalbard	SRA	SRR1509498	No	No	Enterobacteria MS2					X
ES0015	1176	Arctic Peat Soil	Svalbard	SRA	SRR1509518	No	No	Enterobacteria M11					X
ES0016	904	Arctic Peat Soil	Svalbard	SRA	SRR1509518	No	No	Enterobacteria QB					X
ES0017	948	Arctic Peat Soil	Svalbard	SRA	SRR1509518	No	No	Enterobacteria MS2					X
ES0018	1240	Arctic Peat Soil	Svalbard	SRA	SRR1509518	No	No	Caulobacter phiCb5					X
ES0019	1521	Rhizosphere	Norfolk, United Kingdom	SRA	ERR566379	No	No	Caulobacter phiCb5					X
ES0020	1292	Rhizosphere	Norfolk, United Kingdom	SRA	ERR566379	No	No	Caulobacter phiCb5	X				

RNA Bacteriophages Are Prevalent in Publicly Available Metagenomic Datasets

To expand our search space, we analyzed publicly deposited sequencing datasets—generated by other laboratories—that sequenced RNA (>10,000 Sequence Read Archive [SRA] datasets associated with >2,000 publications). These included transcriptomic and RNA-inclusive metagenomic studies. The metagenomic data analyzed were derived from environmental sources, such as oceans, sewage, and soil, and animal-associated sources, including stool. We aligned amino acid sequences from the 20 novel and 19 reference RNA bacteriophages against sequences in these datasets, following six-frame translation, using tBLASTn. Out of 2,765 RNA-inclusive metagenomes and 7,309 transcriptomic datasets examined, 115 contained at least ten sequences with significant alignments (e-value < 10^{-4}). The complete sequencing data from each of these 115 datasets were assembled, and RNA bacteriophage partial genomes were defined as above (length > 750 nt, <70% identity to any other partial or complete genome). We identified 138 unique partial genomes that contained ssRNA bacteriophage domains and five unique partial genomes that contained characteristic dsRNA bacteriophage motifs (Table 2.1; Table 2.2). Thus, including the initial identification of the 20 novel ssRNA bacteriophages, we identified a total of 158 unique ssRNA bacteriophage motif-containing partial genomes. For the partial genomes that contained ssRNA bacteriophage-associated domains, 119 contained RdRp domains, and 81 contained maturation domains (42 contained both maturation and RdRp domains). Three partial genomes contained dsRNA bacteriophage RdRp domains. As RNA viruses are not known to encode multiple RdRp genes, we conservatively estimated the number of novel RNA bacteriophage phylotypes based on the number of partial genomes that contain unique RdRp domains. Based on this criterion, we have identified at least 122 novel RNA bacteriophage phylotypes, greatly increasing the known RNA bacteriophage diversity. Furthermore, it is

possible that some of the partial genomes that contained only maturation domains may derive from additional novel RNA bacteriophages, so this is likely an underestimation.

Table 2.2: List of novel dsRNA bacteriophage partial genomes

Phage	Segment	Contig Size	Phage Source	Geographic Location	Nucleotide Database	Accession Number	Closest Known Cystovirus	dsRNA Motifs
EMS013	L	11089	Sulfur Spring Sediment	Mountain View, USA	SRA	SRR064283	$\phi 8$	RdRp, NTPase, Muramoyl-Dipeptide Carboxypeptidase
EOC003	L	950	Oxygen Minimum Zone	Iquique, Chile	SRA	SRR1617598	$\phi 6/\phi 13$	RdRp
Streptomyces phage $\phi 0$	L	6775	Soil	Canada	SRA	SRX1090146	$\phi 6$	P7 Assembly, P2 RdRp, P4 Packaging NTPase, P1 Procapsid Shell
Streptomyces phage $\phi 0$	M	3397	Soil	Canada	SRA	SRX1090146	$\phi 6$	P3 Host Attachment Protein, P6 Membrane Fusion Protein
Streptomyces phage $\phi 0$	S	3211	Soil	Canada	SRA	SRX1090146	$\phi 13$	P8, Lysozyme Related Gene

Novel RNA Bacteriophage Genomes Are Highly Divergent from Known Genomes

To elucidate the evolutionary relationships between the novel and known RNA bacteriophages, we next performed phylogenetic analysis. Of the 119 novel ssRNA RdRp-domain-containing partial genomes, we limited the analysis to the 71 partial genomes that encompassed all five conserved motifs of the RdRp palm domain³⁵. In addition, we included the 14 “reference ssRNA bacteriophages.” We included an outgroup containing the RdRp palm domains of the two type species of *Narnaviridae*, as their polymerases are most closely related to those of leviviruses³⁶. While bootstrap support for some portions of the tree is limited, it nonetheless demonstrated that the partial genomes were highly divergent from each other and from the known RNA bacteriophages (Figure 2.1A). For the dsRNA bacteriophage-domain-

containing partial genomes, two unique partial genomes contained the entire RdRp gene, and both were clearly distinct (Figure 2.1B).

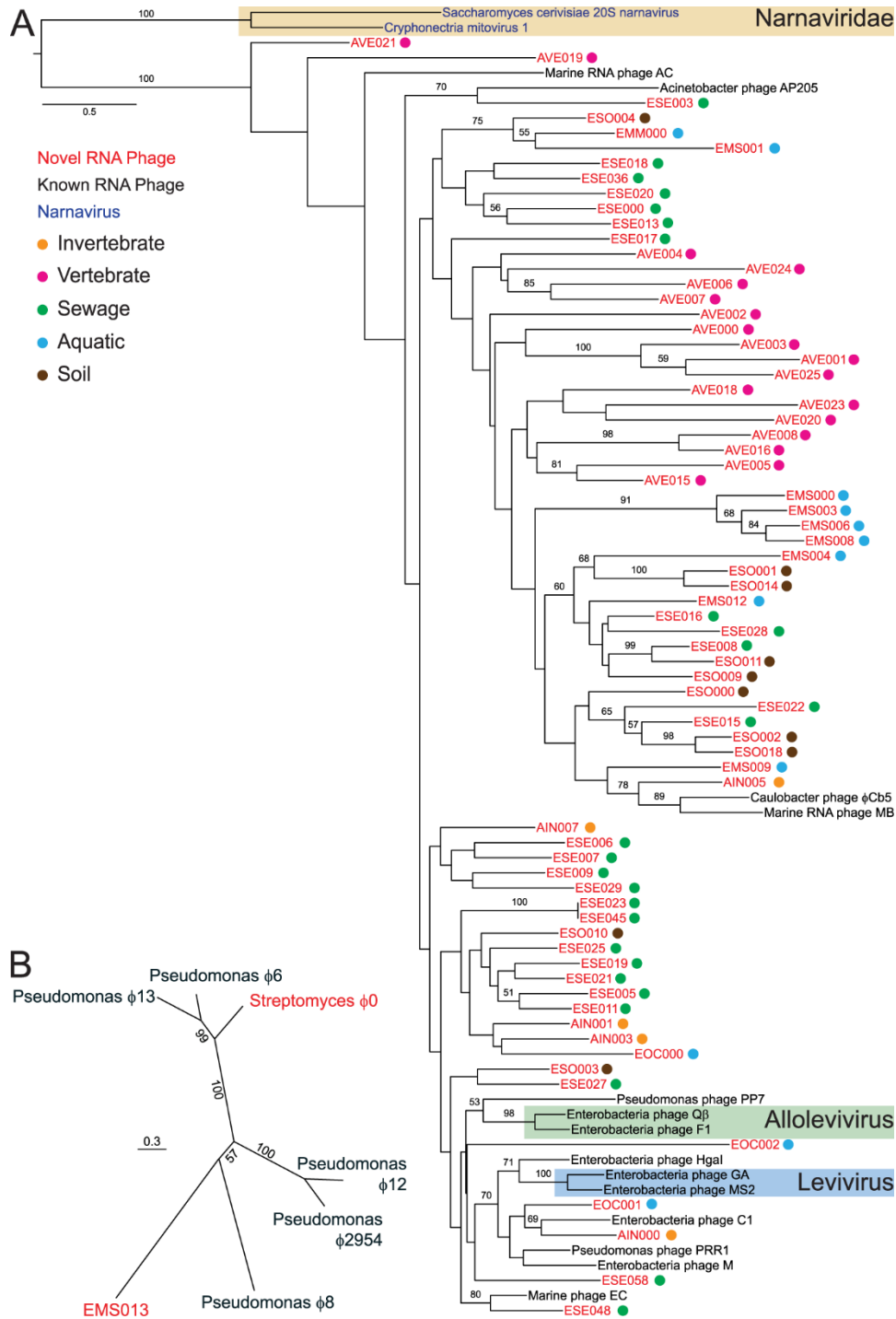


Figure 2.1. Phylogenetic analyses of novel RNA bacteriophages discovered in metagenomic sequencing datasets. (A) ssRNA RdRp domain-based tree. Colored dots represent the ecological niche from which each partial genome was identified. Bootstrap

values under 50 are not displayed. The current ICTV taxonomic classification for RNA bacteriophages and eukaryotic viruses is shaded. (B) Phylogenetic analysis based on RdRp of EMS013 and Streptomyces bacteriophage ϕ 0 with known cystoviruses.

There are currently no official ICTV criteria for defining species among RNA bacteriophages. For many other viral taxa, strictly molecular criteria are used^{37,38}. For example, marine picornaviruses have previously been identified by sequence alignment and classified based on phylogenetic distance³⁸. Taxonomy of DNA bacteriophages has traditionally relied on bacteriophage morphology but now is largely determined using sequence-based criteria, in that phages that share a certain percentage of genes are considered the same species^{39,40}. One possible classification strategy for RNA bacteriophage would be to infer sequence-based criteria based on the current ICTV-recognized species. Distinct ssRNA bacteriophage species within ICTV-recognized genera (levivirus and allolevivirus) share <60% amino acid identity (51% and 55% amino acid identity in the RdRp, respectively). By extension, if membership in a species is defined as sharing $\geq 60\%$ amino acid identity in the RdRp, the 158 ssRNA RNA bacteriophage phylotypes would represent 111 novel RNA bacteriophage species. Even using a 50% amino acid identity threshold (which would collapse currently recognized distinct species into one species) would still result in 53 novel ssRNA bacteriophage species (Table 2.3). Regardless of the final criteria used for classification by the ICTV, the RNA bacteriophage phylotypes identified in this study dramatically expand the known sequence diversity of RNA bacteriophages.

Table 2.3. Number of ssRNA bacteriophage species based on varying amino acid identity cut-offs.

Amino acid identity	Number of Species
70	117
60	111

50	53
40	9

The family *Cystoviridae* has a single genus, the only ICTV-recognized species of which is *Pseudomonas* phage $\phi 6$ ¹². The four additional fully sequenced dsRNA bacteriophage species in Genbank, which are not officially classified in the genus *Cystovirus*, encode polymerase proteins that share 20%–51% amino acid identity to that of *Pseudomonas* phage $\phi 6$. A species defining criterion of 50% amino acid identity would classify the three novel dsRNA bacteriophage phylotypes as three species. A threshold of 40% amino acid identity, which would collapse four distinctly recognized species into two, would result in two novel dsRNA species.

Multiple Novel Genome Organizations for RNA Bacteriophages Identified

Following gene prediction and annotation of all the novel RNA bacteriophages, multiple novel genome organizations were identified. Two of the novel RNA bacteriophage partial genomes, both of which were confirmed by RT-PCR and Sanger sequencing, were much longer than all sequenced leviviruses, which range from 3.73–4.27 kb in length⁴¹. The genome of AVE000 had at least a 4.95 kb genome; this longer genome can be attributed to the presence of a novel >1.20 kb ORF of unknown function that is 5' to and partially overlaps the maturation protein by 259 nucleotides (Figure 2.2A). AVE001 also has an expanded genome of at least 5.02 kb, due to the presence of a strikingly large 2.39 kb ORF containing the maturation domain, which is larger than all of the reference ssRNA bacteriophages maturation genes, which on average are 1.27 kb and range from 1.17–1.60 kb. In addition, AVE002 is the first RNA bacteriophage described to contain two nonoverlapping ORFs between the RdRp and maturation

genes; neither of the two ORFs has discernable similarity to known proteins. While one of these ORFs likely represents the coat protein, the other ORF might represent a novel lysin or have homologous function to the Q β read-through protein. From the 119 ssRNA partial genomes, there were 100 ORFs predicted exclusive of the RdRp and maturation genes. Aside from eight ORFs that had predicted leviviral coat domains and one that had a MS2 lysin domain, none of the other 91 ORFs had primary sequence alignment to any known bacteriophage coat or lysin protein. These ORFs may encode proteins that are coat or lysin orthologs that are unrecognizable because of the greater evolutionary divergence of those genes as compared to the RdRp or maturation protein, or they could have completely novel functionalities. Even in the former case, the extreme evolutionary divergence may result in novel host tropisms or novel mechanisms of bacterial lysis. Further elaboration of these bacteriophage genomes will likely identify additional novel genome organizations and additional novel ORFs of unknown function.

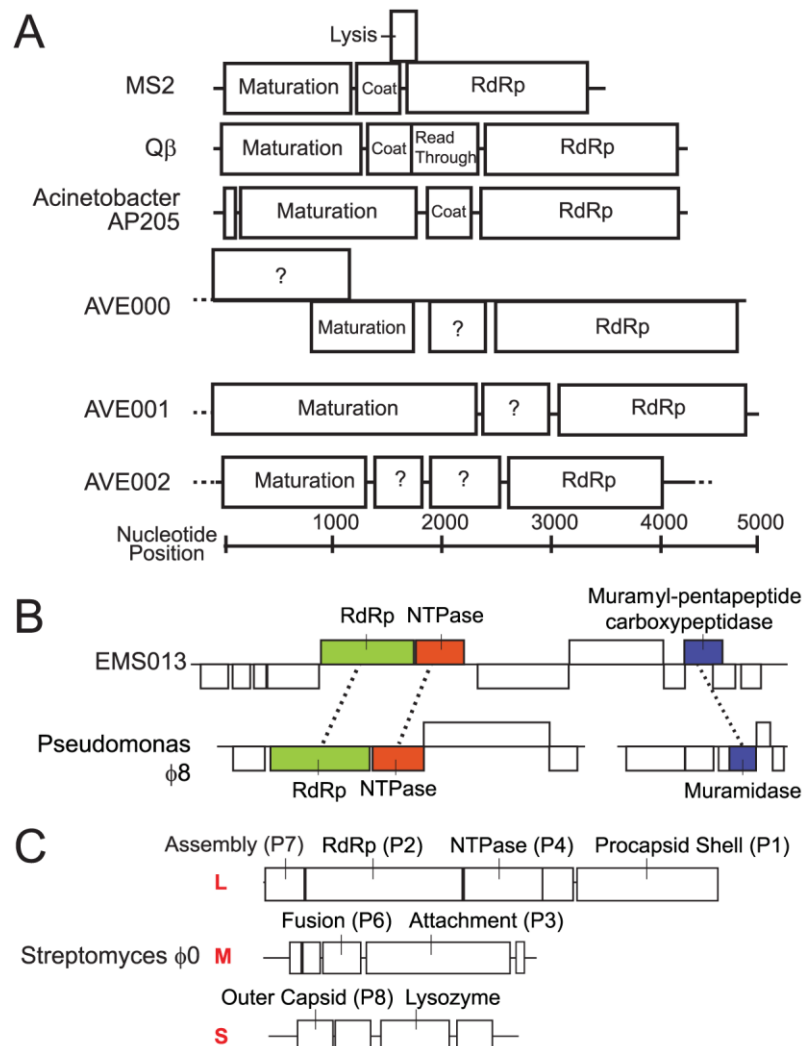


Figure 2.2. Unique characteristics of novel RNA bacteriophage. (A) Genome organizations of three novel RNA bacteriophage partial genomes compared to prototypical RNA bacteriophage. (B) EMS013 and (C) Streptomyces bacteriophage $\phi 0$ genome organizations. ORFs were annotated using protein alignment, conserved domain searching, and structural alignment.

The cystovirus protein sequence queries of public sequencing datasets identified partial genomes that provided evidence of an RNA bacteriophage with a novel genomic organization. All five reference cystoviruses are trisegmented, with a ~6.4 kb L segment encoding both the RdRp and packaging NTPase and a ~2.9 kb S segment separately encoding a peptidoglycan degradation enzyme. We identified EMS013, a single 11.2 kb assembled sequence from a metatranscriptomic sample, originally isolated from the Zodletone sulfur spring, containing three individual ORFs that were annotated with these three functions (Figure 2.2B). Two additional

samples from this sulfur spring in the same study also contained sequences that aligned to this partial genome. An assembled sequence that contains both a cystoviral L and S genes is notable as there is ongoing debate as to the evolutionary origin of cystoviruses⁴². One model suggests that cystoviruses share a common eukaryote-infecting ancestor with segmented eukaryotic RNA viruses. The competing model suggests that cystoviruses originate from an unsegmented bacteria-infecting dsRNA bacteriophage. While this partial genome is based solely on in silico assembly, a provocative hypothesis is that this bacteriophage could represent evidence of an unsegmented cystovirus ancestor.

Identification of a RNA Bacteriophage in a Gram-Positive Bacteria Transcriptome Study

As the majority of the novel RNA bacteriophage partial genomes were detected in metagenomic datasets derived from complex microbial communities, the host bacterium of each bacteriophage could not be explicitly determined by our analyses in most cases. One notable exception was the detection of three dsRNA motif-containing assembled sequences in a publically available bacterial transcriptomic study derived from pure culture of *Streptomyces avermitilis*⁴³. This bacteriophage had the traditional genome organization of cystoviruses, although many ORFs could not be definitively annotated by either sequence or structural alignment (Figure 2.2C). This was named *Streptomyces* bacteriophage $\phi 0$, keeping with nomenclature conventions of other cystoviruses. The study was composed of two conditions with three replicates each, and five out of six samples contained sequences from the RNA bacteriophage. The presence of sequences in each of the specimens in this experiment, combined with the annotation of the study as being derived from bacterial monoculture, strongly suggests that *S. avermitilis* represents the true host for this bacteriophage. As the known RNA

bacteriophages are only believed to infect proteobacteria, Streptomyces bacteriophage $\phi 0$, if experimentally confirmed to infect *S. avermitilis*, would represent the first RNA bacteriophage known to infect bacteria in a phylum other than the proteobacteria. Moreover, it would be the first RNA bacteriophage known to infect a gram-positive bacteria, thereby dramatically broadening the known bacterial host range of RNA bacteriophages.

RNA Bacteriophages Inhabit Multiple Novel Biogeographies

While many bacteriophages were found from ecologies known to harbor RNA bacteriophages, namely mammalian stool and sewage, we identified numerous bacteriophages from novel ecological niches (Table 2.1). Interestingly, we identified numerous bacteriophages that originated from microbial communities of invertebrate hosts, including pools of insects and aquatic invertebrates such as crabs, sponges, and barnacles. Additionally, bacteriophages were identified from microbial sediments associated with extreme aquatic environments, such as sulfur springs and benthic cold seeps.

RNA Bacteriophages Are Acutely Present in the Microbiome

In order to evaluate spatial and temporal trends associated with novel RNA bacteriophages, we defined the prevalence of RNA bacteriophages in stool from previously described cohorts³² of rhesus macaques collected at the Tulane National Primate Research Center (TNPRC) and the New England Primate Research Center (NEPRC) using both metagenomic and RT-PCR-based approaches. Specimens from NEPRC were available at two separate time points, 24 and 64 wk post SIV infection. Based on metagenomic sequencing data, 34 out of 120 specimens had at least one sequence from one novel RNA bacteriophage, with ten

specimens containing at least one sequence from two or more novel RNA bacteriophages (Figure 2.3). To independently assess the prevalence of a subset of these RNA bacteriophages, we screened this cohort using two sets of PCR primers: one set for AVE000 and another for AVE001. We detected AVE000 in five out of 120 rhesus macaques and detected AVE001 in 13 specimens. The AVE000-positive amplicon sequences shared 95%–99% nucleotide identity with each other, while AVE001-positive amplicons shared 84%–100% nucleotide identity with each other. Phylogenetic analysis demonstrated that there was apparent geographic segregation of both AVE000 and AVE001, as sequences from each primate research center formed distinct clusters (Figure 2.4, Table 2.4, Table 2.5). All specimens positive by metagenomic sequencing for AVE000 or AVE001 were confirmed to be RT-PCR positive. In addition, four specimens that were negative by metagenomic sequencing were RT-PCR positive, most likely because of the increased sensitivity of the RT-PCR assay compared to metagenomic sequencing. The geographic clustering of the amplicon sequences combined with their observed diversity strongly argues against the possibility of laboratory contamination, as all of these specimens were prepared using the same protocol and reagents. From the RT-PCR analysis, we found only two macaques were positive for the same RNA bacteriophage at two separate time points, suggesting that AVE000 and AVE001 generally do not persist (Figure 2.4). Similarly, from the metagenomic analysis, the vast majority of the RNA bacteriophages were only present at a single time point. This acute presence of these RNA bacteriophages is in stark contrast to the persistent nature in the primate gut of lytic DNA bacteriophages, specifically the *Microviridae* bacteriophages²³.

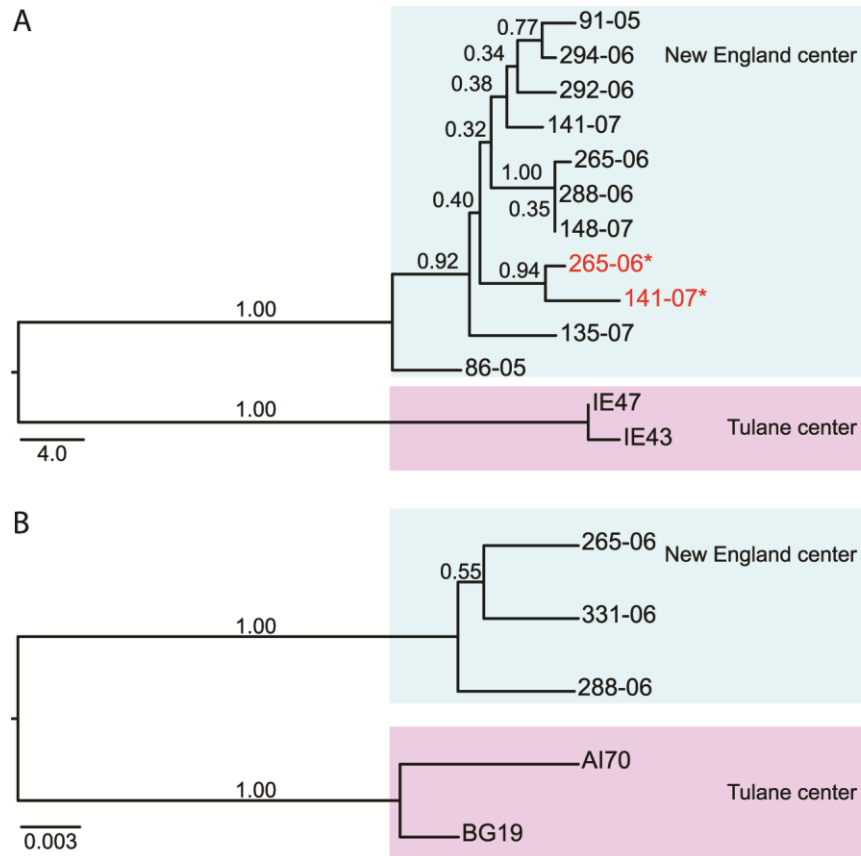


Figure 2.4. Maximum-likelihood phylogenetic analysis of (A) AVE001- and (B) AVE000-positive amplicons. Red text and asterisks indicate samples from the second time point.

Table 2.4. Nucleotide alignment identities of AVE001 amplicons from the screening of Rhesus Macaque Study 1. Top half: pairwise nucleotide identity. Bottom half: number of mismatched nucleotides.

Location	Time Point	Specimen	265-06	141-07	135-07	141-07	147-07	265-06	91-05	86-05	294-06	288-06	148-07	IE43	IE47
NEPRC	64	265-06		0.99	0.97	0.98	0.98	0.98	0.97	0.97	0.98	0.98	0.98	0.84	0.84
NEPRC	64	141-07	6		0.97	0.97	0.97	0.97	0.97	0.96	0.97	0.97	0.97	0.84	0.84
NEPRC	24	135-07	12	16		0.98	0.98	0.97	0.98	0.97	0.98	0.97	0.97	0.84	0.85
NEPRC	24	141-07	10	14	11		0.99	0.98	0.99	0.97	0.99	0.99	0.99	0.85	0.85
NEPRC	24	147-07	10	14	11	6		0.98	0.99	0.97	0.99	0.99	0.99	0.84	0.85
NEPRC	24	265-06	10	14	13	8	8		0.97	0.96	0.98	1	1	0.84	0.84
NEPRC	24	91-05	12	14	11	6	6	12		0.96	0.99	0.98	0.98	0.84	0.85
NEPRC	24	86-05	15	17	14	15	15	17	17		0.97	0.97	0.97	0.86	0.86
NEPRC	24	294-06	11	15	8	5	5	11	3	14		0.98	0.98	0.84	0.85
NEPRC	24	288-06	9	13	12	7	7	1	11	16	10		1	0.84	0.85
NEPRC	24	148-07	9	13	12	7	7	1	11	16	10	0		0.84	0.85
TNPRC	NA	IE43	77	78	76	72	76	77	75	67	75	76	76		1
TNPRC	NA	IE47	75	76	74	70	74	75	73	65	73	74	74	2	

Table 2.5. Nucleotide alignment identities of AVE000 amplicons from the screening of Rhesus Macaque Study 1. Top half: pairwise nucleotide identity. Bottom half: number of mismatched nucleotides.

Location	Specimen	265-06	288-06	313-08	AI70	BG19
NEPRC	265-06		0.99	0.99	0.95	0.95
NEPRC	288-06	5		0.99	0.95	0.95
NEPRC	313-08	4	5		0.95	0.95
TNPRC	AI70	23	22	23		0.99
TNPRC	BG19	20	21	20	5	

In this study, we have vastly increased the number of known RNA bacteriophage phylotypes and demonstrated their presence in a wide range of habitats worldwide. However, this is clearly an underestimate of the total number of RNA bacteriophage species, as there are undoubtedly many more novel RNA bacteriophages that remain undiscovered. While our work has clearly identified a much greater diversity of RNA bacteriophages, there are still obvious taxonomic groups that are missing. For example, RNA bacteriophages that contain negative-sense genomes or helical capsids have still not been identified, both of which underscore some of the many remaining gaps left in our understanding of RNA bacteriophage diversity. Some of these novel RNA bacteriophages may be present in existing metagenomic datasets that simply cannot be currently recognized because of a lack of primary sequence alignment. Furthermore, the vast majority of metagenomic studies are still heavily DNA-centric. With the increased recognition of the importance of RNA bacteriophages and RNA eukaryotic viruses, the number of RNA-inclusive metagenomic datasets will surely grow, leading to additional discoveries of novel RNA bacteriophages. Critically, the multitude of RNA bacteriophages already identified in this study provide a unique opportunity to define their natural contributions to ecology, explore novel aspects of their life cycle, and potentially exploit them as novel tools for bacteriophage therapy.

Methods

Ethics Statement

Mouse experiments yielding metagenomic data were performed with the approval of the Washington University IACUC, under protocol #20140244.

Metagenomic Studies Mined for RNA Bacteriophages

Rhesus Macaque Study 1. We analyzed 120 stool specimens that had been previously sequenced using 454 FLX Titanium technology from a previously published study (MG-RAST Project 1449, 1451, 1452)³². Briefly, rhesus macaques were either pathogenically infected with SIV or served as controls. They were housed at NEPRC or TNPRC. Macaques at NEPRC were sampled at two time points, 24 and 64 wk post SIV infection, whereas macaques at TNPRC were sampled once.

Rhesus Macaque Study 2. From 36 primates that were a subset of a previously published SIV vaccination cohort, 79 stools were collected³¹. Stools were processed as previously described³². Stools were diluted 1:6 in PBS, filtered through 0.45 μ m filter, and extracted on a COBAS Ampliprep Instrument (Roche). Nucleic acids were subjected to random cDNA synthesis and then amplification TruSeq library (Illumina). Libraries were sequenced on an Illumina MiSeq Platform⁴⁴. All sequences were uploaded to the European Nucleotide Archive under the project PRJEB9503.

Murine study. Stool pellets combined from two mouse cages infected with murine astrovirus were metagenomically analyzed as previously described^{45,46}. Briefly, stool was diluted in 1:6 in PBS and filtered through a 0.45 μ m membrane to minimize recovery of intact

bacteria. Total nucleic acid was extracted from the filtrate, subjected to random-priming cDNA synthesis and amplification, and sequenced by 454 FLX Titanium pyrosequencing. The sequences from this specimen are deposited in NCBI SRA under PRJNA291303.

Sewage study. The sewage sequencing reads have been previously described and are deposited in NCBI SRA (Accession SRA040148)³⁰. Briefly, untreated wastewater was obtained from Pittsburgh, Pennsylvania, United States; Barcelona, Spain; and Addis Ababa, Ethiopia, and then virions were concentrated using organic flocculation. Both RNA and DNA were isolated and subsequently sequenced using the 454 FLX Titanium pyrosequencing.

tBLASTn query of previously sequenced databases. Nucleotide databases were constructed using either 454 FLX Titanium or Illumina MiSeq sequencing reads from specimens from the above studies. We constructed nucleotide databases from 454 sequencing-based reads that did not align to any known protein within the Genbank non-redundant (nr) database, as determined by VirusHunter⁴⁷. Illumina MiSeq-based nucleotide databases were constructed from sequencing reads that did not align to any known human or eukaryotic viral protein in the non-redundant database, at an e-value of 10^{-3} . We downloaded complete reference genomes of all 11 *Leviviridae* and five *Cystoviridae* species, as defined by NCBI Taxonomy, and isolated amino acid sequences of all annotated ORFs. These amino acid sequences were then queried against the described databases using tBLASTn (non-default parameters: -evalue 1e-4 – num_descriptions 100000 –num_alignments 100000 –outfmt 7).

tBLASTn query of SRA deposited databases. Using the command line NCBI SRA tBLASTn, amino acid sequences were queried against deposited nucleotide databases that were annotated as having sequenced RNA. SRA was searched for datasets using the key terms “stool,” “feces,” “sewage,” “wastewater,” “metatranscriptome,” “ocean,” “viromes,” or “freshwater;” the

resulting datasets were further filtered to select those that were annotated to sequence RNA. Similarly, all SRA datasets from individual bacteria were identified by querying the NCBI Taxonomy database with the bacteria taxonomic identification number (taxid2) and then filtering for sequencing of RNA. As these latter studies often contained many specimens, we randomly selected, using a random number generator, a single specimen from each study for analysis; if a specimen had reads that aligned to RNA bacteriophage, every specimen from that study was subsequently analyzed for RNA bacteriophage reads. These datasets were queried using amino acid sequences derived from the 19 reference RNA bacteriophage and 20 novel RNA bacteriophage we identified from initial analysis of our own metagenomic datasets using tBLASTn with the same parameters as above.

Partial genome assembly. For every specimen that had more than ten reads that aligned with an e-value $< 10^{-4}$, all deposited reads from the specimen were then assembled with IDBA using default parameters⁴⁸. Specimen datasets larger than 8 GB were split into files smaller than 8 GB for assembly, with each smaller file individually assembled. The contiguous sequences (contigs) resulting from these individually assembled files were then combined into one file and batch assembled together using IDBA. Only contigs longer than 750 nucleotides were selected for further analysis. Because there are no official guidelines from the ICTV for defining a species for RNA bacteriophages, we selected 70% nucleotide identity in the RdRp or maturation gene as a cutoff for defining unique phylotypes in this study, as this cutoff represented the trend from known leviviral species, in which strains can vary as low as 72% nucleotide identity across the RdRp and maturation genes. Therefore, we defined contigs that BLASTn determined to share greater than 70% nucleotide identity across the RdRp or maturation genes as the same phylotype.

The longest contig that contained RNA bacteriophage domains from these total assemblies were used as the partial genome.

Novel RNA bacteriophage nomenclature. Novel RNA bacteriophages were named based on the ecology from which they were identified. The first letter designates whether the bacteriophage was identified from an animal (A) or an environmental (E) specimen. The second two letters designate a more specific ecological designation, where IN = invertebrate, VE = vertebrate, SE = sewage, SO = soil, MS = microbial sediment, MM = microbial mat, and OC = ocean. The three letters were followed by a three-digit number.

Experimental confirmation of contig assembly and 3' termini sequencing. Multiple PCR primers were designed to confirm eight (AVE000, AVE001, AVE002, AVE003, AVE004, AVE005, AVE006, and AVE007) of the assembled partial genomes (Table 2.6). RT-PCR was performed using the Qiagen OneStep RT-PCR kit. Gaps between contigs from the same specimen were closed by designing PCR primers from the existing contigs. Using 3' RACE as previously described, 3' termini were confirmed⁴⁷. Briefly, total nucleic acid was polyadenylated (Ambion), column purified (Qiagen RNEasy), and then used as a template in OneStep RT-PCR (Qiagen), using an Oligo-d(T) primer and the primers specified (Table 2.6). All amplicons were cloned into pCR4-TOPO and Sanger sequenced. Each partial genome was sequenced to >2x coverage by Sanger sequencing. Discrepancies between next-generation sequencing partial genomes and Sanger sequencing reads were resolved with additional Sanger sequencing.

Table 2.6: List of primers used to confirm partial genomes by Sanger sequence

PhageSpecies	PrimerName	Sequence
AVE000	SK_MiSeq70_Levivirus_1	TTGCAACGGAAAAAGCCGAG

AVE000	SK_MiSeq70_Levivirus_2	CCTGGTTAACACCAGACCCC
AVE000	SK_MiSeq70_Levivirus_3	GAATCAACCCATTCGTGCGG
AVE000	SK_MiSeq70_Levivirus_4	AAGTTGCTGGCCTATCGCTT
AVE000	SK_MiSeq70_Levivirus_5	CCCCTCTACTACAATGAAAGGAGTG
AVE000	SK_MiSeq70_Levivirus_6	CATCCGGACTTCGGTCTCAG
AVE000	SK_MiSeq70_Levivirus_7	CTTCGCAGGCCAGCAAAAAT
AVE000	SK_MiSeq70_Levivirus_8	CCTTTTCGACCATGGGGTCA
AVE000	SK_MiSeq70_Levivirus_9	AGTCAACGGATCGTGGAGTC
AVE000	SK_MiSeq70_Levivirus_10	GACCTGAAGCGTGTAGGTGA
AVE000	SK-MiSeq70Broad1	GTGTWCAAARACACACC
AVE000	SK-MiSeq70Broad2	TGWYTCMACWGGGAAAC
AVE000	SK_MiSeq70_3RACE	TCGCAAAGCGATATACAGCGG
AVE000	SK_MiSeq70_3RACE2	TCGAACCGATTCAACGCTCA
AVE000	SK_MiSeq70_3RACE3	CGCAAAGCGATATACAGCGG
AVE001	SK_MiSeq66.5_Levi_1	TGCAATGCGGATAGCGTTTG
AVE001	SK_MiSeq66.5_Levi_2	GACTTTGAGTCCCCTCCCG
AVE001	SK_MiSeq66.5_Levi_3	GTGTGGGTAAGGTGACCTCG
AVE001	SK_MiSeq66.5_Levi_4	TTTTGTAGCTCTGAGGCGCA
AVE001	SK_MiSeq66.5_Levi_5	CTGGGATGAGAGCCTTGGTG
AVE001	SK_MiSeq66.5_Levi_6	ATGCCTTCAGTGTAGCTCCG
AVE001	SK-MiSeq66.5Yokoyama1	AAGGATCGACTMATWACWGTSGAGCCG
AVE001	SK-MiSeq66.5Yokoyama2	AGAACGACTTRGCCSKGTTKACGCGGAAG
AVE001	SK_MiSeq66.5_3RACE	GTCTGTACACTTCTGGAACAG
AVE001	SK_MiSeq66.5_3RACE2	CTGGCCCTTCTTAGTAGAGGG
AVE001	SK_MiSeq66.5_3RACE3	ACGCTCTTTGGTCATCGGTT
AVE001	SK_MiSeq66.5_3RACE4	CTGCGAAGGGGAGAGCATTCA
AVE002	SK_MiSeq69_0_Levi_1	ACCCAGGACACCCTAATCCA
AVE002	SK_MiSeq69_0_Levi_2	GGATCAGCGACCAATGACGA
AVE002	SK_MiSeq69_0_Levi_3	GTACGCAAAGACGAACAGCG
AVE002	SK_MiSeq69_0_Levi_4	ATCTGGTCACGGACTCTCCA
AVE002	SK_MiSeq69_0_Levi_5	GCAGGCCTGATGGGTAAAGT
AVE002	SK_MiSeq69_0_Levi_6	GAACCGTCGGATGCGTAGAT
AVE003	Yokoyama_Levi_1	GCCGAAGACGAAGGTACACA
AVE003	Yokoyama_Levi_2	CCGGCAGCGTTTTAGATTTCG
AVE003	Yokoyama_Levi_3	ACATCAACTCCGGCGCTAAA
AVE003	Yokoyama_Levi_4	GCTAATAGCTCCTCAGGGCG
AVE003	Yokoyama_Levi_5	GCCCTTCGTGACTGATGGAA
AVE003	Yokoyama_Levi_3RACE1	CAACCGGGCTAAGTCGTTT
AVE003	Yokoyama_Levi_3RACE2	CGTATCGCACGGTTTTTCGAC
AVE004	SK_Tulane_IP45_1	GTAATCGCAATCCAAGGAAGGG
AVE004	SK_Tulane_IP45_2	TGCAAGGATTTTCTTACTGTGT
AVE004	SK_Tulane_IP45_3	TTGCAGACCCTTGTGCGTA

AVE004	SK_Tulane_IP45_4	CCACTGGCATAACATCCACCA
AVE004	SK_Tulane_IP45_1_New	GTAATCGCAATCCAAGGAAAGG
AVE005	SK_Contig4_Fwd	GGCATATACCGGAAGCCACA
AVE005	SK_Contig1_Rev	CCACATGGTCGTAACAGGCT
AVE005	SK_Contig2_Fwd	AATGGCTGGACATGGCTCAA
AVE005	SK_Contig3_Rev	GAGCCAGTCTCGATCATCCG
AVE006	SK_IP94_Levivirus_1	TTCCCATTATCGCCAGAGGC
AVE006	SK_IP94_Levivirus_2	GCGAAATGACTGCGTAGCTG
AVE006	SK_IP94_Levivirus_3	GGGCACTCGGCTCTCTATTC
AVE006	SK_IP94_Levivirus_4	GGGTTTCCCACACAGGACAT
AVE006	SK_IP94_Levivirus_5	GCACGATTATTAAGGAGGTGC
AVE006	SK_IP94_Levivirus_6	GGCCAACAGTTACAGGGTCA
AVE006	SK_IP94_Levivirus_7	AGACTATACGCCATGCGAGC
AVE006	SK_IP94_Levivirus_8	AGAGGACTGAAAACGTTCCGG
AVE007	SK_MiSeq64_0_Levi_1	AGGAGACAGATATGACTAATC
AVE007	SK_MiSeq64_0_Levi_2	CCTCCACGAAAACATTAGGGT
AVE007	SK_MiSeq64_0_Levi_3	GCCCGTTCAGGACTAAGTGA
AVE007	SK_MiSeq64_0_Levi_4	CCTTCTGTGCGGATGATCC

Genomic analysis. ORFs were predicted using ORF Finder from NCBI and subsequently analyzed for conserved domains using the NCBI Conserved-Domain Search. Domain annotation was defined using NCBI conserved domains that had e-values $< 10^{-3}$ or structural alignments with greater than 90% accuracy using Phyre2. Global alignment of RNA bacteriophage proteins was performed with the MUSCLE algorithm using MEGA6, and pairwise percent identity was calculated based on the p-distance based on the alignment matrix.

Phylogenetic analysis. ssRNA bacteriophage phylogeny was determined by acquiring RdRp protein sequences from NCBI GenBank for all reference levivirus genomes (Enterobacteria bacteriophage FI: NC_004301.1, Acinetobacter bacteriophage AP205: NC_002700.2, Enterobacteria bacteriophage Q β : NC_001890.1, Caulobacter bacteriophage ϕ Cb5: NC_019453.1, Pseudomonas bacteriophage PP7: NC_001628.1, Pseudomonas

bacteriophage PRR1: NC_008294.1, Enterobacteria bacteriophage MS2: NC_001417.2, Enterobacteria bacteriophage Hgal1: NC_019922.1, Enterobacteria bacteriophage C-1 INW-2012: NC_019920.1, Enterobacteria bacteriophage GA: NC_001426.1, and Enterobacteria bacteriophage M: NC_019707.1) as well as three additional known ssRNA bacteriophages: Marine bacteriophage MB: KF510034.2, Marine bacteriophage EC: KF616862.2, and Marine bacteriophage AC: KF616864. Additionally, the two type species of the family *Narnaviridae* (Cryphonectria parasitica mitovirus: NC_004046.1, and Saccharomyces cerevisiae narnavirus 20S: NC_004051.1) were included as out-groups. Novel ssRNA bacteriophage that contained all five motifs of the RdRp palm domain as determined by multiple sequence alignment to the known ssRNA bacteriophage were selected for phylogenetic analysis. Amino acid sequences were aligned using 13 iterations of MUSCLE in MEGA6. The palm domain alignment was isolated, and noninformative sequences were trimmed using GBlocks (minimum number of sequences for a conserved position = 20, minimum number of sequences for a flank position = 73, maximum number of contiguous nonconserved positions = 20, minimum length of a block = 4, and allowed gap positions = all) ⁴⁹. The final trimmed alignment was manually edited to preserve known conserved RdRp motifs and then used to construct maximum likelihood phylogenetic trees using Blosum62 + F + G + I with 100 bootstrap replicates in PhyML. dsRNA bacteriophage phylogeny was determined by acquiring RdRp protein sequences from NCBI GenBank for all reference cystovirus genomes (Pseudomonas bacteriophage ϕ 6: NC_003715.1, Pseudomonas bacteriophage ϕ 8: NC_003299.1, Pseudomonas bacteriophage ϕ 12: NC_004173.1, Pseudomonas bacteriophage ϕ 13: NC_004172.1 and Pseudomonas bacteriophage ϕ 2954: NC_012091.2). Novel dsRNA bacteriophages that contained the full RdRp ORF were also selected for phylogenetic analysis. Amino acid sequences were aligned using six iterations of

MUSCLE and maximum likelihood phylogenetic trees using LG + F + G + I with 100 bootstrap replicates in MEGA6. Phylogenetic trees that examine single phylotype diversity based on RT-PCR screening were constructed using nucleotide sequence alignments using MUSCLE with six iterations in MEGA6. Maximum likelihood trees were constructed using the Kimura 2-parameter model with 100 bootstraps.

RT-PCR screening of samples in Rhesus Macaque Study 1. PCR primers designed to detect AVE000 and AVE001 (Table 2.6) were designed. PCR cycling conditions were 50 °C for 45 min, 95 °C for 15 min, and 40 cycles of 95 °C for 30 s, 50 °C for 30 s, and 72 °C for 1 min, followed by 72 °C for 10 min using OneStep RT-PCR (Qiagen).

References

- 1 Atarashi, K. *et al.* Induction of Colonic Regulatory T Cells by Indigenous Clostridium Species. *Science* **331**, 337-342, doi:10.1126/science.1198469 (2011).
- 2 Lupp, C. *et al.* Host-Mediated Inflammation Disrupts the Intestinal Microbiota and Promotes the Overgrowth of Enterobacteriaceae. *Cell Host & Microbe* **2**, 119-129, doi:10.1016/j.chom.2007.06.010 (2007).
- 3 Le Chatelier, E. *et al.* Richness of human gut microbiome correlates with metabolic markers. *Nature* **500**, 541-546, doi:10.1038/nature12506 (2013).
- 4 Stecher, B. *et al.* Salmonella enterica serovar typhimurium exploits inflammation to compete with the intestinal microbiota. *PLoS Biology* **5**, 2177-2189, doi:10.1371/journal.pbio.0050244 (2007).
- 5 Young, R. Phage lysis: Three steps, three choices, one outcome. *Journal of Microbiology* **52**, 243-258, doi:10.1007/s12275-014-4087-z (2014).
- 6 Weitz, J. S. *et al.* Phage-bacteria infection networks. *Trends in Microbiology* **21**, 82-91, doi:10.1016/j.tim.2012.11.003 (2013).
- 7 Angly, F. E. *et al.* The marine viromes of four oceanic regions. *PLoS Biology* **4**, 2121-2131, doi:10.1371/journal.pbio.0040368 (2006).
- 8 Deng, L. *et al.* Viral tagging reveals discrete populations in Synechococcus viral genome sequence space. *Nature advance on*, doi:10.1038/nature13459 (2014).
- 9 Bergh, O., Børshheim, K. Y., Bratbak, G. & Heldal, M. High abundance of viruses found in aquatic environments. *Nature* **340**, 467-468, doi:10.1038/340467a0 (1989).
- 10 Suttle, C. a. Marine viruses--major players in the global ecosystem. *Nature reviews. Microbiology* **5**, 801-812, doi:10.1038/nrmicro1750 (2007).
- 11 van Duin, J. & Olsthoorn, R. C. L. in *Virus Taxonomy* 1035-1043 (2012).
- 12 Poranen, M. M. & Bamford, D. H. in *Virus Taxonomy* 515-518 (2012).
- 13 Greninger, A. L. & Derisi, L. Draft Genome Sequences of Leviviridae RNA Phages EC and MB Recovered from San Francisco Wastewater. *Genome Announcements* **3**, 9-10, doi:10.1128/genomeA.00652-15.Copyright (2015).
- 14 Kannyo, S., Shao, Y. & Wang, I.-N. Rethinking the evolution of single-stranded RNA (ssRNA) bacteriophages based on genomic sequences and characterizations of two R-plasmid-dependent ssRNA phages, C-1 and Hgal1. *Journal of bacteriology* **194**, 5073-5079, doi:10.1128/JB.00929-12 (2012).
- 15 Furuse, K. & Osawa, S. Bacteriophage distribution in human faeces: continuous survey of healthy subjects and patients with internal and leukaemic diseases. *Journal of General Virology* **64**, 2039-2043 (1983).
- 16 Osawa, S., Furuse, K. & Watanabe, I. Distribution of ribonucleic acid coliphages in animals. *Applied and environmental microbiology* **41**, 164-168 (1981).
- 17 Furuse, K. & Ando, A. Distribution of ribonucleic acid coliphages in raw sewage from treatment plants in Japan. *Applied and environmental microbiology* **41**, 1139-1139 (1981).
- 18 Furuse, K. *et al.* Distribution of ribonucleic acid coliphages in south and east Asia. *Applied and environmental microbiology* **35**, 995-1002 (1978).
- 19 Dantas, G., Sommer, M. O. a., Degan, P. H. & Goodman, A. L. Experimental approaches for defining functional roles of microbes in the human gut. *Annual review of microbiology* **67**, 459-475, doi:10.1146/annurev-micro-092412-155642 (2013).
- 20 Breitbart, M. *et al.* Metagenomic Analyses of an Uncultured Viral Community from Human Feces Metagenomic Analyses of an Uncultured Viral Community from Human Feces. *Journal of Bacteriology* **185**, 6220-6223, doi:10.1128/JB.185.20.6220 (2003).
- 21 Minot, S. *et al.* The human gut virome: inter-individual variation and dynamic response to diet. *Genome research* **21**, 1616-1625, doi:10.1101/gr.122705.111 (2011).

- 22 Minot, S., Grunberg, S., Wu, G. D., Lewis, J. D. & Bushman, F. D. Hypervariable loci in the human gut virome. *Proceedings of the National Academy of Sciences of the United States of America* **109**, 3962-3966, doi:10.1073/pnas.1119061109 (2012).
- 23 Minot, S. *et al.* Rapid evolution of the human gut virome. **110**, doi:10.1073/pnas.1300833110/-/DCSupplemental.www.pnas.org/cgi/doi/10.1073/pnas.1300833110 (2013).
- 24 Reyes, A. *et al.* Viruses in the faecal microbiota of monozygotic twins and their mothers. *Nature* **466**, 334-338, doi:10.1038/nature09199 (2010).
- 25 Reyes, A., Semenkovich, N. P., Whiteson, K., Rohwer, F. & Gordon, J. I. Going viral: next-generation sequencing applied to phage populations in the human gut. *Nature reviews. Microbiology* **10**, 607-617, doi:10.1038/nrmicro2853 (2012).
- 26 Oh, J. *et al.* Biogeography and individuality shape function in the human skin metagenome. *Nature* **514**, 59-64, doi:10.1038/nature13786 (2014).
- 27 Vlaminc, I. D. *et al.* Temporal Response of the Human Virome to Immunosuppression and Antiviral Therapy. *Cell* **155**, 1178-1187, doi:10.1016/j.cell.2013.10.034 (2013).
- 28 Roux, S., Hallam, S. J., Woyke, T. & Sullivan, M. B. Viral dark matter and virus-host interactions resolved from publicly available microbial genomes. *eLife* **10** (2015).
- 29 Dutilh, B. E. *et al.* A highly abundant bacteriophage discovered in the unknown sequences of human faecal metagenomes. *Nature Communications* **5**, 1-11, doi:10.1038/ncomms5498 (2014).
- 30 Cantalupo, P. G., Calgua, B. & Zhao, G. Raw Sewage Harbors Diverse Viral Populations. doi:10.1128/mBio.00180-11.Editor (2011).
- 31 Barouch, D. H. *et al.* Protective efficacy of adenovirus-protein vaccines against SIV challenges in rhesus monkeys. *Science (New York, N.Y.)* **28**, 1-9, doi:10.1126/science.aab3886 (2015).
- 32 Handley, S. a. *et al.* Pathogenic simian immunodeficiency virus infection is associated with expansion of the enteric virome. *Cell* **151**, 253-266, doi:10.1016/j.cell.2012.09.024 (2012).
- 33 Kelley, L. A., Mezulis, S., Yates, C. M., Wass, M. N. & Sternberg, M. J. E. The Phyre2 web portal for protein modeling , prediction and analysis. *Nature Protocols* **10**, 845-858, doi:10.1038/nprot.2015-053 (2015).
- 34 Marchler-Bauer, A. *et al.* CDD: NCBI's conserved domain database. *Nucleic Acids Research* **43**, D222-D226, doi:10.1093/nar/gku1221 (2014).
- 35 Kidmose, R. T., Vasiliev, N. N., Chetverin, A. B., Andersen, G. R. & Knudsen, C. R. Structure of the Qbeta replicase, an RNA-dependent RNA polymerase consisting of viral and host proteins. *Proceedings of the National Academy of Sciences of the United States of America* **107**, 10884-10889, doi:10.1073/pnas.1003015107 (2010).
- 36 Hillman, B. I. & Esteban, R. 1055-1060 (2012).
- 37 Adams, M. J., Antoniw, J. F. & Fauquet, C. M. Molecular criteria for genus and species discrimination within the family Potyviridae. *Archives of Virology* **150**, 459-479, doi:10.1007/s00705-004-0440-6 (2005).
- 38 Culley, A. I. & Steward, G. F. New genera of RNA viruses in subtropical seawater, inferred from polymerase gene sequences. *Applied and environmental microbiology* **73**, 5937-5944, doi:10.1128/AEM.01065-07 (2007).
- 39 Lawrence, J. G., Hatfull, G. F. & Hendrix, R. W. Imbroglis of Viral Taxonomy: Genetic Exchange and Failings of Phenetic Approaches. *Journal of Bacteriology* **184**, 4891-4905, doi:10.1128/JB.184.17.4891 (2002).
- 40 Lavigne, R., Seto, D., Mahadevan, P., Ackermann, H. W. & Kropinski, A. M. Unifying classical and molecular taxonomic classification: analysis of the Podoviridae using BLASTP-based tools. *Research in microbiology* **159**, 406-414, doi:10.1016/j.resmic.2008.03.005 (2008).
- 41 Friedman, S. D., Genthner, F. J., Gentry, J., Sobsey, M. D. & Vinjé, J. Gene mapping and phylogenetic analysis of the complete genome from 30 single-stranded RNA male-specific

- coliphages (family Leviviridae). *Journal of virology* **83**, 11233-11243, doi:10.1128/JVI.01308-09 (2009).
- 42 Holmes, E. C. *The Evolution and Emergence of RNA Viruses* 1edn, (Oxford University Press, 2009).
- 43 Liot, Q. & Constant, P. Breathing air to save energy - new insights into the ecophysiological role of high-affinity [NiFe]-hydrogenase in *Streptomyces avermitilis*. *MicrobiologyOpen*, 1-13, doi:10.1002/mbo3.310 (2015).
- 44 Lim, E. S., Deem, S. L., Porton, I. J., Cao, S. & Wang, D. Species-Specific Transmission of Novel Picornaviruses in Lemurs. *Journal of Virology* **89**, 4002-4010, doi:10.1128/JVI.03342-14 (2015).
- 45 Lim, E. S. *et al.* Discovery of rosavirus 2, a novel variant of a rodent-associated picornavirus, in children from The Gambia. *Virology* **454-455**, 25-33, doi:10.1016/j.virol.2014.01.018 (2014).
- 46 Yokoyama, C. C. *et al.* Adaptive Immunity Restricts Replication of Novel Murine Astroviruses. *Journal of Virology* **86**, 12262-12270, doi:10.1128/JVI.02018-12 (2012).
- 47 Zhao, G. *et al.* Identification of novel viruses using VirusHunter--an automated data analysis pipeline. *PloS one* **8**, e78470-e78470, doi:10.1371/journal.pone.0078470 (2013).
- 48 Peng, Y., Leung, H. C. M., Yiu, S. M. & Chin, F. Y. L. IDBA-UD: a de novo assembler for single-cell and metagenomic sequencing data with highly uneven depth. *Bioinformatics (Oxford, England)* **28**, 1420-1428, doi:10.1093/bioinformatics/bts174 (2012).
- 49 Castresana, J. Selection of conserved blocks from multiple alignments for their use in phylogenetic analysis. *Molecular biology and evolution* **17**, 540-552, doi:10.1093/oxfordjournals.molbev.a026334 (2000).

3. Identification of a novel bunya-like virus using DiscoVir, an alignment independent k-mer algorithm for viral sequence classification

This work was submitted to Nature Microbiology

Siddharth Krishnamurthy^{1,2}, Guoyan Zhao², Emad Mohareb³, Iva Christova⁴, S. Josh Swamidass², David Wang^{1,2*}

¹Department of Molecular Microbiology, ²Department of Pathology and Immunology, Washington University in St. Louis, St. Louis, MO,

³U.S. Naval Medical Research Unit #3, Cairo, Egypt

⁴National Center of Infectious and Parasitic Diseases, Sofia, Bulgaria

Abstract

Alignment of deep sequencing reads to known reference genomes enables metagenomic studies of microbial populations. While this is an effective method of classification for some sequences, many sequences have no significant alignment to any sequenced organism. Here we describe DiscoVir, a support vector machine (SVM) model that relies on nucleotide k-mer frequencies to discriminate sequences of novel, highly disparate eukaryotic viruses from prokaryotic and fungal sequences. We validated *in silico* that the model can identify viruses from novel viral taxa using a leave two taxa out approach. Furthermore, DiscoVir outperforms BLASTx for almost all viral families. When we applied DiscoVir to a metagenomic dataset from which we only could identify one segment of a tripartite bunyavirus by conventional alignment, DiscoVir identified two additional contigs that corresponded to the two undetected segments of the virus. By selectively culturing fungi from this serum sample, we identified an isolate of *Penicillium atramentosum* that contained all three viral RNA segments. Sequencing of these segments demonstrated that the terminal nucleotide sequences were conserved between the three segments, and these sequences were consistent with the termini of viruses in the genera *Phlebovirus* and *Tenuivirus*. We determined that this virus can be vertically transmitted through fungal spores and that every spore isolated contained this virus. Thus, application of DiscoVir played a critical role in the identification of the first segmented negative stranded RNA virus of a fungus. DiscoVir is the first algorithm to identify novel viral sequences without requiring alignment.

Introduction

The discovery of novel eukaryotic viruses has enhanced our understanding of human disease^{1,2}. Next generation metagenomic sequencing has rapidly accelerated the rate of viral discovery. However, despite this rapid progress, highly divergent eukaryotic viruses are still difficult to identify due to the absence of a universally conserved gene among all viruses analogous to the 16S rRNA gene in bacteria³. Current metagenomic analysis of viruses is dependent on primary sequence alignment to known reference genome or protein databases in order to assign metagenomic sequences to novel viruses⁴. Highly divergent viruses are particularly challenging because viruses mutate faster than any cellular organism, and thus their genes are less likely to align to known viruses³. Therefore, there is a critical need to develop tools that are able to discover highly divergent viruses without requiring sequence alignment. The ability to identify highly divergent viral sequences will increase our understanding of metagenomic communities and help identify novel, potentially disease-causing viruses.

K-mers are contiguous sequences of k elements, most often amino acids or nucleotides in biology. Many alignment-independent methods use k-mer frequencies to compositionally transform a sequence into a vector in which each element represents a specific k-mer frequency. Various vector operations, such as the inner product or Euclidean distance, can then be calculated to measure sequence relatedness. Using this approach, alignment-independent methods such as Phylopythia and RaiPhy can classify bacterial sequences using machine learning models, including support vector machines, developed from compositionally transformed genome fragments from bacteria^{5,6}. Furthermore, applications have used k-mers to differentiate noise from true biological signal from metagenomic data⁷⁻⁹. Complex site metagenomes such as stool, sewage and oceans are largely dominated by bacterial sequences;

therefore, to better identify viral reads, alignment-independent methods that can specifically separate viral reads from reads originating from other highly diverse organisms, such as bacterial and fungi, are necessary. While many alignment-independent methods can classify bacterial sequences^{3,5,6,10-14} and one can classify DNA eukaryotic viral sequences¹⁵, no algorithm has been described that is broadly applicable for classification of all types of eukaryotic viral sequences (DNA viruses, RNA viruses and retroviruses).

The *Bunyaviridae* viral family contains tri-segmented negative-sense RNA viruses that infect humans, plants and arthropods. Some members of this family, such as Rift Valley fever and Crimean Congo hemorrhagic fever, cause acute febrile illness that can progress to fatal hemorrhagic fever or encephalitis¹⁶. Their genomes encode a RNA dependent RNA Polymerase (RdRp) on the L segment, envelope glycoproteins genes on the M segment, and a nucleocapsid gene on the S segment, with specific genera of bunyaviruses encoding additional non-structural genes. Multipartite viruses pose a particular difficult challenge for sequence-based identification unlike the situation with monopartite viruses, where a single highly conserved region (e.g. RdRp) may suffice to identify the entire viral genome.

Here, we present DiscoVir, a k-mer based method for discriminating viral sequences from bacterial and fungal sequences. DiscoVir represents sequences as k-mer vectors and uses support vector machines to generate a model that classifies unknown sequences as viral or non-viral. Our *in silico* results demonstrate that DiscoVir is capable of identifying more highly divergent viral sequences than the traditional alignment based BLASTx. Finally, we demonstrate the utility of DiscoVir in real metagenomic data; use of DiscoVir played a critical role in the identification of a novel multi-segmented virus distantly related to known bunyaviruses present in the serum of a patient with unknown febrile illness. Surprisingly, follow up studies

demonstrated that the virus infects a *Penicillium atramentosum* strain present in the patient serum sample. This virus represents the first known segmented negative-sense RNA virus to infect a fungus.

Results:

Parameterization and in silico evaluation of DiscoVir

The DiscoVir classifier analyzes k-mer transformed sequences using a SVM that discriminates bacterial and viral sequences and a SVM that discriminates fungal and viral sequences. The outputs of these two SVMs are then integrated using a logistic regression, resulting in a log-odds value that evaluate whether a sequence is viral. This log-odds value can then be converted into a probability that a given sequence is viral. To optimize the classification accuracy of both initial SVMs, we evaluated multiple models with varying k-mer and sequence lengths using 5-fold cross validation. We tested a range of values of k ($2 \leq k \leq 8$) and sequence lengths (50, 100, 200 and 400 nucleotides) to identify the optimal parameterization space to enable viral sequence separation. We determined that there were two maxima for viral sequence discrimination from bacteria at $k = 4$ at a sequence length of 400 nt and $k = 6$ at a sequence length of 200 nt with area under the curves (AUCs) of receiver operating characteristic (ROC) of 0.81 and 0.83, respectively (Table 3.1). Similar maxima existed for viral sequence discrimination from fungi. Therefore, we established two models of DiscoVir, one using 400 nucleotide length sequences on sequencing data that has sequences 400 base pairs or longer and one utilizing 200 nucleotide length sequences on sequencing data that range between 200-400 nucleotides.

Table 3.1. Optimization of DiscoVir parameters. Virus-bacteria and Virus-Fungi SVM models were optimized for k-mer length and sequence length.

	K-mer Length
--	--------------

		2	3	4	5	6	7	8	
Sequence Length	Bacteria	50	0.56	0.59	0.61	0.62	0.62	0.62	0.63
		100	0.62	0.65	0.66	0.67	0.68	0.69	0.70
		200	0.75	0.79	0.80	0.82	0.83	0.83	0.83
		400	0.75	0.79	0.81	0.81	0.80	0.79	0.77
	Fungi	50	0.58	0.61	0.64	0.65	0.63	0.66	0.67
		100	0.64	0.69	0.67	0.69	0.70	0.72	0.72
		200	0.74	0.75	0.76	0.79	0.82	0.81	0.81
		400	0.76	0.82	0.84	0.84	0.83	0.82	0.80

DiscoVir outperforms BLASTx in identifying sequences from highly divergent viral families

One of the central challenges in viral metagenomics is identifying novel, highly divergent viruses that are members of undiscovered taxa. Therefore, we wanted to test how well DiscoVir could discriminate between sequences from novel viral taxa and novel bacterial or fungal taxa. To evaluate DiscoVir, we simulated a novel virus identification experiment using a leave two taxa out approach. A total of 69 viral taxa, 18 bacterial taxa and 8 fungal taxa were used as input data. In each iteration, all sequences derived from one virus taxon and one non-virus taxon were set aside to be used as test data set. A model was generated from the remaining training set and was assessed for its ability to separate the viral from the non-viral sequences in the test data set. This process was repeated with both SVMs for all combinations of one viral taxa and one non-viral taxa, resulting in 1,794 simulations (Appendix 2). This assessment is more challenging for the classifier than standard cross-validation protocols, because both viral and non-viral sequences in the test set are from taxa the classifier does not see during training. As a performance baseline against which to compare DiscoVir, we also assessed BLASTx in the same protocol. We aligned the held out sequences from the viral and non-viral taxa against protein sequence databases that

were depleted of protein sequences from those taxa. Bitscores were retrieved as measures for alignment and receiver operating characteristic (ROC) curves were constructed.

Except for one viral-bacterial taxon comparison (out of 1242), we found that the bacteria-virus SVM performed better than BLASTx at distinguishing viral sequences from bacteria (Figure 3.1a). The average AUC for the 1242 bacteria-virus SVM was 0.9 (range 0.58-1) while for BLASTx the average was 0.53 (range 0.20-0.73). The bacteria-virus SVM performed well, including for bacterial phyla that performed consistently poorly in BLASTx such as *Proteobacteria* and *Terrabacteria*, (Figure 3.2). Novel *Proteobacteria* and *Terrabacteria* sequences might not be inherently difficult to align to other bacterial protein sequences, especially when protein sequences from *Proteobacteria* and *Terrabacteria* are included in the protein database. However, these results demonstrate the idea that in the absence of close relatives, there are sequences from novel bacteria so divergent that they can align better to viral protein sequences than some viral sequences (Figure 3.1a). Even for the best performing viral taxa in the BLASTx analysis, *Carmotetraviridae*, *Virgaviridae* and *Idaeovirus*, the bacteria-virus SVM outperformed BLASTx based on AUC scores (Figure 3.3). The aligned sequences mostly originated from the RNA dependent RNA polymerase genes in these viruses, which are highly conserved with other viral families. Similarly, the fungus-virus SVM outperformed BLASTx in 67% of the comparisons when viral and fungal taxa were removed (Figure 3.1b). The fungus-virus SVM was very sensitive to which phylum of fungus was being used as a comparison, with *Blastocladiomycota* being very well predicted by the SVM while *Microsporidia* were very poorly predicted (Figure 3.1b, Figure 3.4).

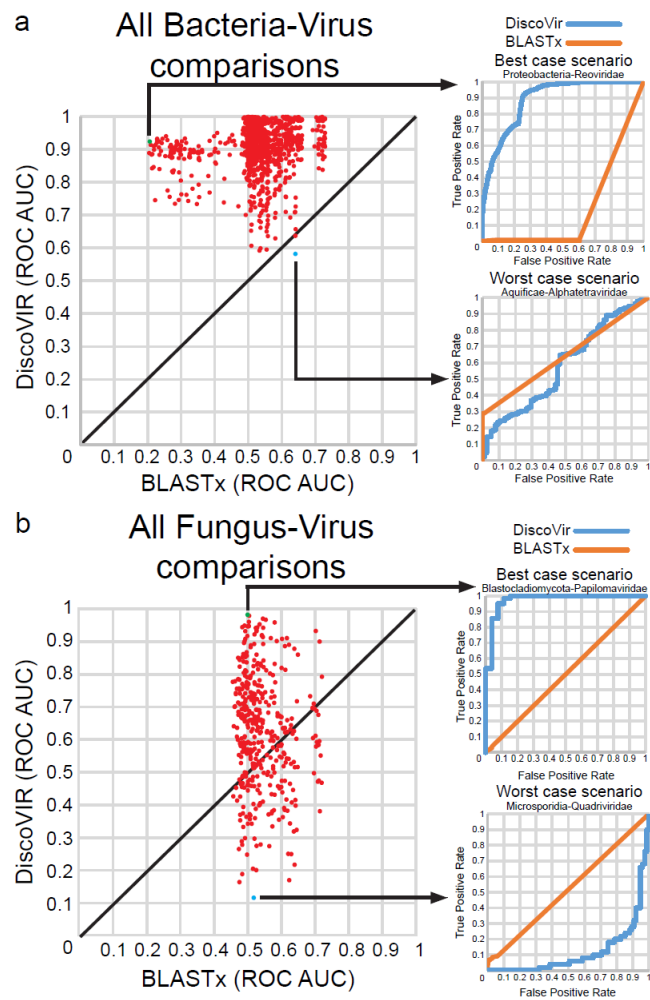


Figure 3.1. Performance of DiscoVir compared to BLASTx in a simulated experiment for identifying novel viral sequences. Sequences from one viral and either (a) one bacterial or (b) one fungal top-level taxon were left out of the training data for DiscoVir and were then used as test sets to predict how well DiscoVir could taxonomically classify these sequences. An analogous simulated experiment was performed for BLASTx in which amino acid sequences from the top-level taxa were removed from the protein database, and the sequences from the left out taxa were then used as test sets to assess how well BLASTx could taxonomically classify these sequences. ROC Curves were constructed from both of these experiments and plotted. Example ROC curves are provided of both the best case (upper) and worst case (lower) predictive scenarios.

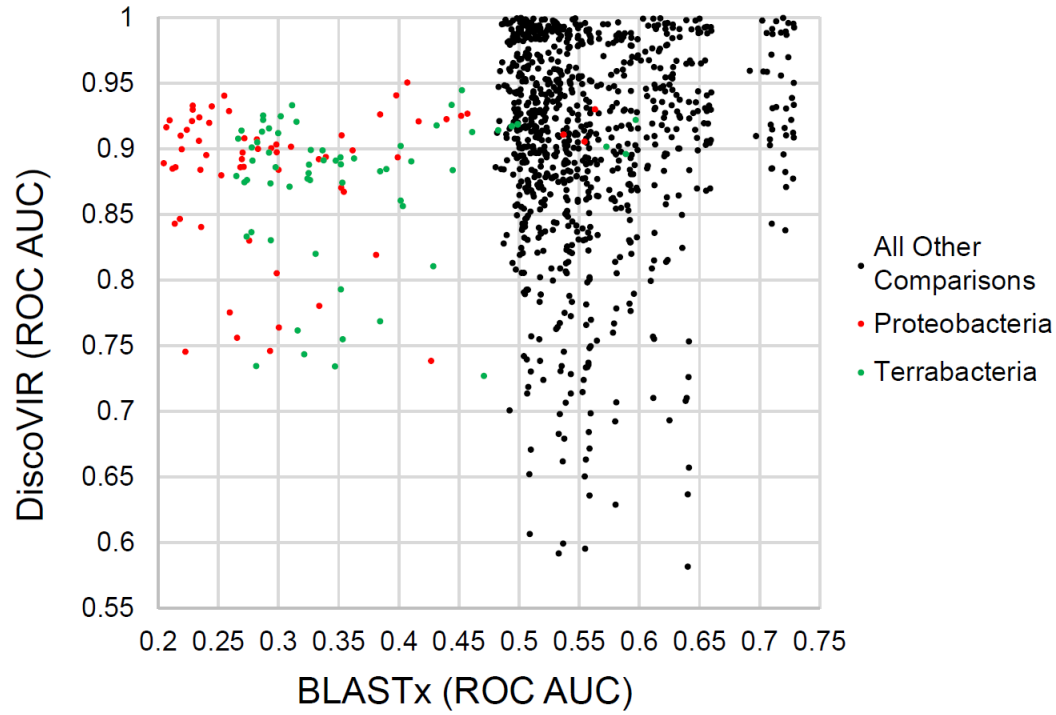


Figure 3.2. Simulated experiment using DiscoVir and BLASTx with comparisons that involve Proteobacteria and Terrabacteria highlighted

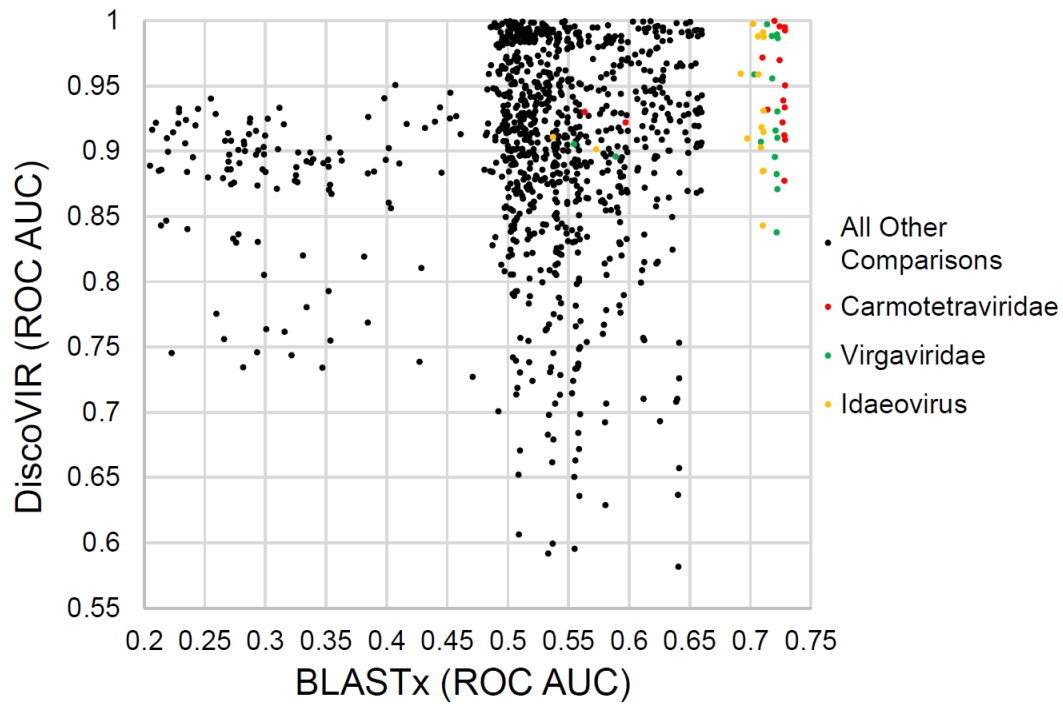


Figure 3.3. Simulated experiment using DiscoVir and BLASTx with comparisons that involve Carmotetraviridae, Virgaviridae, and Idaeovirus highlighted

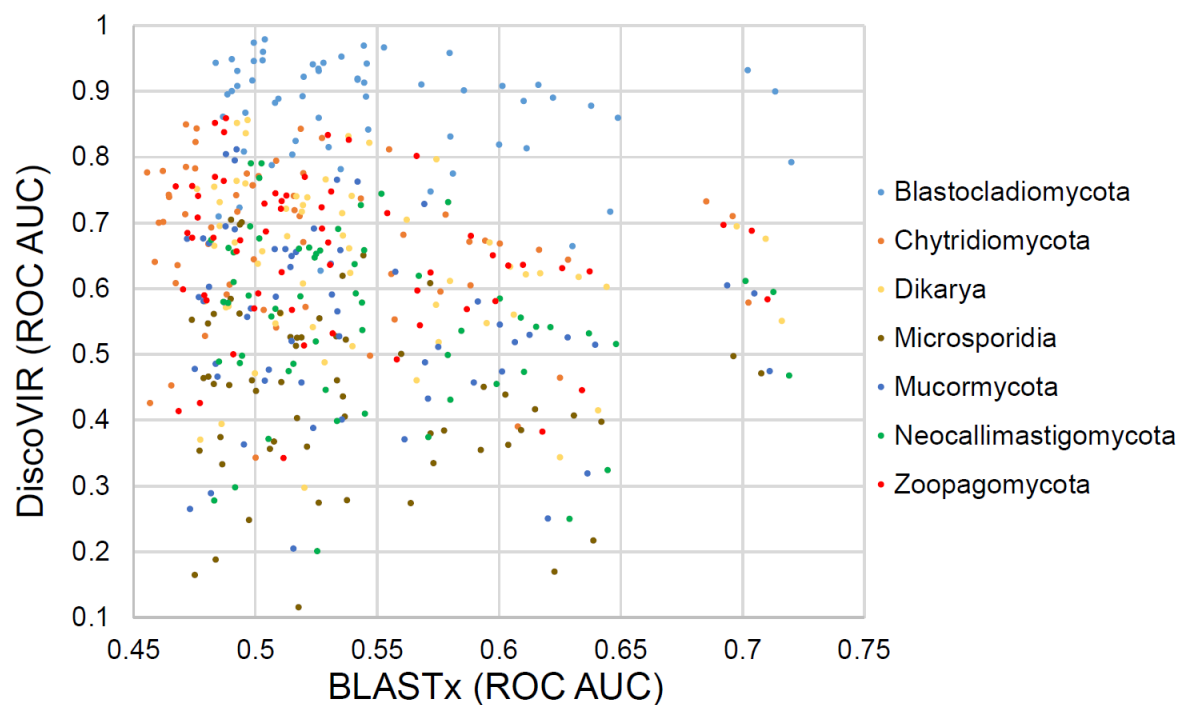


Figure 3.4. Simulated experiment using DiscoVir and BLASTx with each fungal taxa highlighted

A common goal of computationally identifying novel viral sequences is to establish candidate sequences for further experimental validation. Experimental validation rarely can be performed on a large set of sequences, therefore it is useful for any viral sequence classifier to have the highest ranked sequences have a very low false positive rate. The proportion of accurately classified sequences at the highest confidence of prediction scores is defined as the early retrieval rate. To compare the early retrieval rate of DiscoVir and BLASTx, we constructed concentrated receiver operating characteristic (CROC) curves based on the leave two taxa out simulated experimental data¹⁷. We found that the early retrieval rate for the bacteria-virus SVM was generally higher than BLASTx, with 82% of the comparisons resulting in the bacteria-virus SVM having a higher CROC AUC than BLASTx (Figure 3.5). The fungi-virus SVM however,

generally had a worse early retrieval than BLASTx, although both BLASTx and the fungi-virus SVM had a high misclassification rate for early retrieval in general.

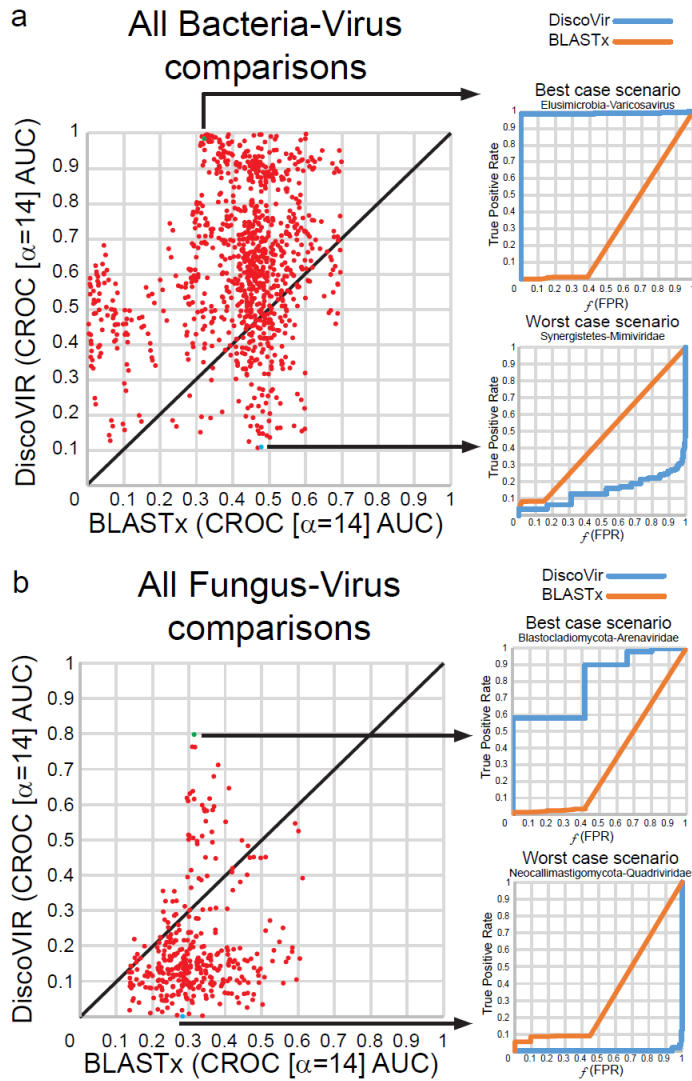


Figure 3.5. Early retrieval rate was measured for the simulated experiment using CROC curves with an alpha = 14, for both (a) bacterial and (b) fungal taxa, CROC curves are provided of both the best case (left panel) and worst case (right panel) predictive scenarios.

Novel bunya-like virus identified from human serum

We applied DiscoVir to identify novel viral sequences in an authentic metagenomic dataset derived from a human serum sample. The serum sample originated from a 69 year-old male in Bulgaria who presented with a fever of 39.2°C, shaking, excessive sweating,

lymphadenopathy, hepatomegaly, fatigue, joint pain, muscle soreness and a skin lesion. He was seronegative for etiologic agents of hemorrhagic fever endemic to that geographic region, including Hantaan virus, Puumala virus, Crimean-Congo Hemorrhagic Fever virus, Tick Borne Encephalitis virus and Q-Fever.

The dataset contained a total of 702,502 unique, high quality reads (Illumina MiSeq 2X250 nucleotide length reads). Primary sequence alignment using BLASTx identified reads from numerous viruses in this sample, including 12 reads that aligned to Torque Teno-Like Virus, 41 reads that aligned to Human Adenovirus C and one read that aligned to Durania virus, a bunyavirus. Additionally, over half of the total primary reads contained no translated product that could be aligned to any known protein. This high number could be in part due to the abundance of non-coding nucleic acid in eukaryotic genomes, which would not contain a protein product to align.

Assembly of the primary reads resulted in a total 182 assembled contiguous sequences (contigs) of at least 500 nucleotides, of which 140 contigs aligned to known proteins. Two contigs contained translation products that aligned to known viruses, one aligned to the Human Adenovirus C Fiber protein and another aligned distantly to Durania virus RdRp. No reads or contigs were identified that shared detectable sequence similarity with any M or S segment from any bunyavirus. Phylogenetic analysis based on the predicted bunyaviral RdRp domain demonstrated that it was highly divergent from other bunyavirus RdRps, but was most closely related to those of phleboviruses and tenuiviruses (Figure 3.6A). The novel virus encoding this RdRp was named Discovirus.

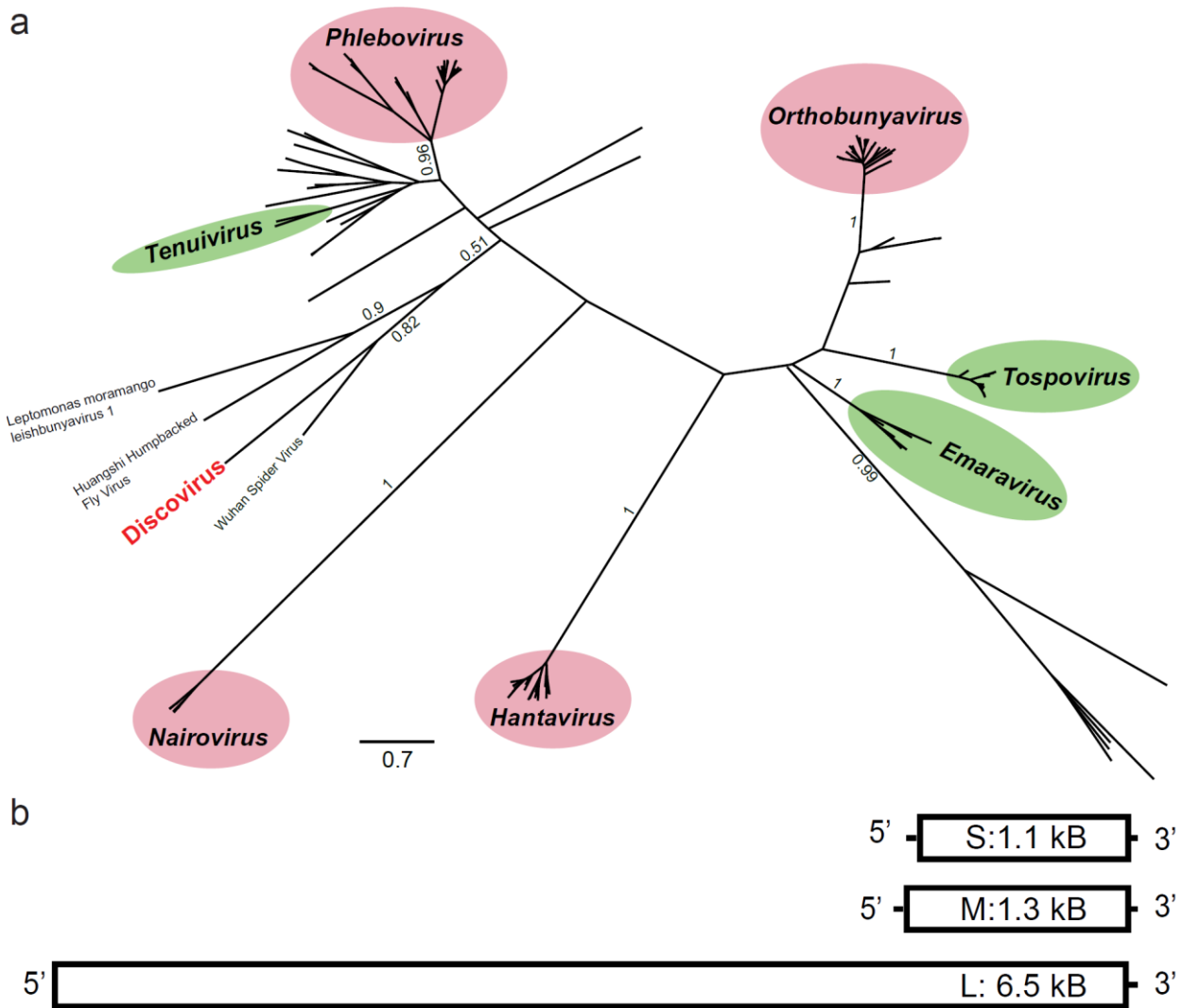


Figure 3.6. Phylogeny and genome organization of Discovirus. (a) Phylogenetic tree of Discovirus RdRp (b) Genomic organization of Discovirus.

DiscoVir identified candidate viral sequences among the contigs

As all known viruses in the family *Bunyaviridae* are tri-segmented, we sought to identify the additional genome segments of Discovirus by applying DiscoVir to the 42 contigs in the dataset that did not align to any known proteins. Of these, 5 were predicted to have at least 33% probability of being viral in origin (Table 3.2). Structural modeling using Phyre2 identified one of these five contigs (contig-10) as having significant structural homology to a bunyaviral nucleocapsid protein, suggesting this may be the S segment (Figure 3.6B). Of the remaining four

potential viral contigs, one (contig-7; 1.3 kB in length) had similar sequencing depth coverage as the other two contigs (Table 3.2). Based on these analyses, we hypothesized that these were the two best candidate contigs that might be derived from the additional genome segments of Discovirus.

Table 3.2. Assembled contig prediction by DisoVir.

Contig Number	Contig Length	Coverage	Bacteria-Virus SVM Score	Fungal-Virus SVM Score	DiscoVir Score	Probability Sequence is viral	Aligns to Discovirus
174	502	7	0.84	-0.50	0.70	0.669	No
81	646	2	0.80	-0.54	0.47	0.616	No
7	1367	310	0.89	-0.67	0.06	0.514	Yes: M
147	530	4	0.70	-0.77	-0.64	0.346	No
10	1251	210	0.72	-0.78	-0.69	0.334	Yes: S
170	510	2	0.92	-0.85	-0.71	0.329	No
105	594	2	0.94	-0.86	-0.73	0.325	No
166	514	8	0.80	-0.83	-0.76	0.318	No
118	574	2	0.84	-0.85	-0.81	0.307	No
29	932	5	1.34	-1.07	-1.05	0.260	No
28	964	5	0.75	-0.89	-1.12	0.246	No
149	528	3	0.51	-0.82	-1.15	0.241	No
115	577	1	1.25	-1.12	-1.41	0.196	No
101	602	6	0.84	-0.99	-1.42	0.194	No
85	636	2	0.60	-0.92	-1.44	0.191	No
181	500	11	0.93	-1.03	-1.48	0.186	No
25	985	4	0.85	-1.02	-1.52	0.179	No
125	563	2	0.78	-1.00	-1.55	0.175	No
142	535	4	0.54	-0.95	-1.66	0.160	No
52	734	3	0.60	-0.97	-1.67	0.158	No
121	571	1	0.56	-0.96	-1.69	0.155	No
150	527	3	0.62	-0.99	-1.72	0.152	No
98	616	18	0.25	-0.87	-1.74	0.150	No
87	633	3	0.77	-1.04	-1.75	0.149	No
117	575	9	0.80	-1.07	-1.83	0.138	No
163	518	5	0.84	-1.11	-1.92	0.127	No
108	590	30	0.63	-1.06	-1.99	0.120	No
176	501	3	0.05	-0.88	-2.02	0.117	No
144	532	2	0.53	-1.04	-2.07	0.112	No
55	729	3	0.81	-1.15	-2.14	0.105	No
37	817	8	0.50	-1.06	-2.20	0.099	No
110	583	13	-0.17	-0.85	-2.23	0.097	No
40	795	1	0.46	-1.10	-2.42	0.082	No
49	756	2	0.39	-1.09	-2.48	0.077	No
71	672	2	0.34	-1.09	-2.53	0.074	No
112	578	4	0.30	-1.11	-2.70	0.063	No
122	566	1	0.17	-1.09	-2.80	0.057	No
84	641	1	-0.33	-0.98	-2.99	0.048	No
133	550	5	-0.03	-1.17	-3.39	0.033	No
104	600	1	-0.08	-1.17	-3.47	0.030	No
119	574	2	-0.11	-1.19	-3.62	0.026	No
106	591	10	-0.60	-1.14	-4.06	0.017	No

***Penicillium* colonies recovered from patient serum contained Discovirus**

Attempts to culture Discovervirus from the serum sample using Vero, BHK, SW13 and C6/36 cell lines did not yield any detectable cytopathic effect. Additionally, infection in suckling mice did not cause any noticeable pathology (data not shown). These failures combined with the fact that none of the candidate assembled contigs were predicted to contain coding regions expressing transmembrane regions, which are classic features of viral envelope proteins, lead us to ask whether there might be a non-human host for this virus present in the patient serum sample. To address this possibility, we analyzed the non-human and non-viral contigs present in the metagenomic sequencing dataset. The conceptual translation products of 99 assembled contigs aligned to various fungal proteins, many within the *Penicillium* genus with 75-90% amino acid identity. In an effort to culture fungi from this sample, patient serum sample was incubated on Blood Heart Infusion (BHI) and Sabouraud Dextrose agar (SDA) plates. After 4 days at 30°C, fungal colonies of mold morphology were present on both plates (Figure 3.7). The fungal colonies were taxonomically classified by isolating genomic DNA from multiple colonies from the SDA plate and sequencing the Inter-Transcribed Spacer (ITS) region. The ITS region was identical among all the colonies, and clustered among *P. atremetosum* strains (Figure 3.8). We named this isolate *P. atremetosum* St. Louis.



Figure 3.7. Discovervirus containing *Penicillium* colony morphology on SDA plate from serum of a patient with acute febrile illness.

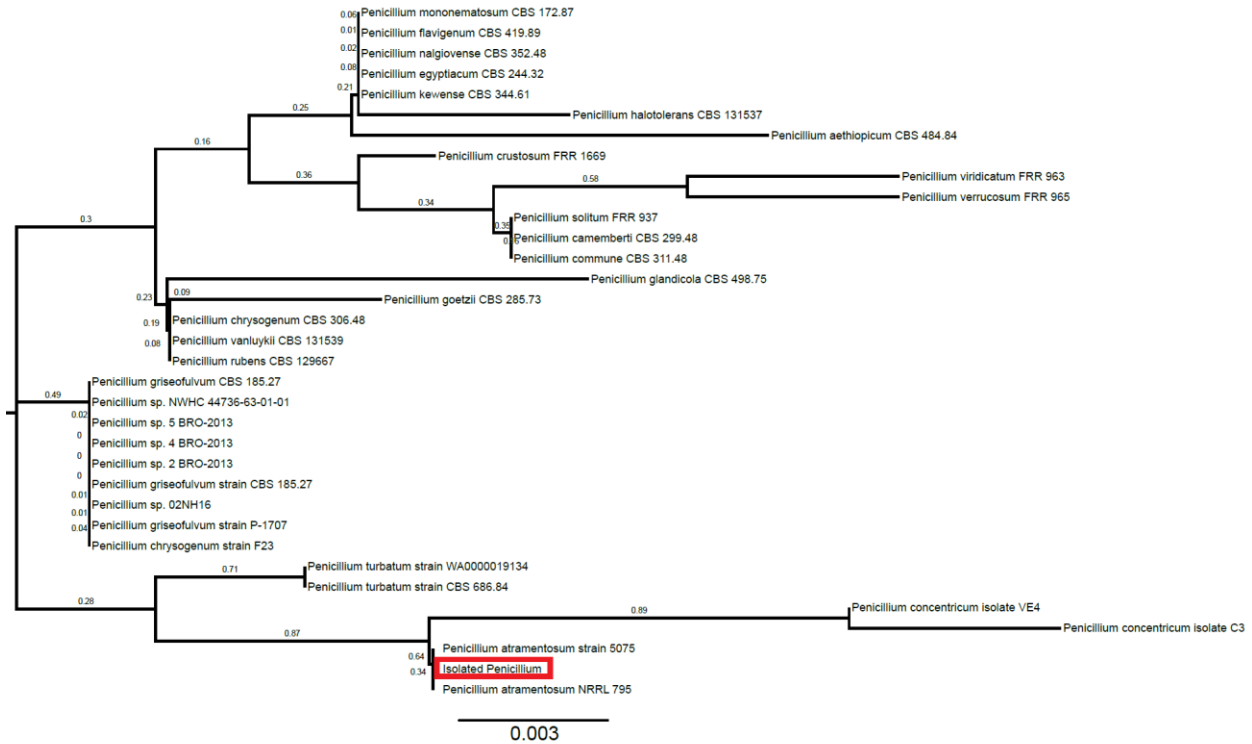


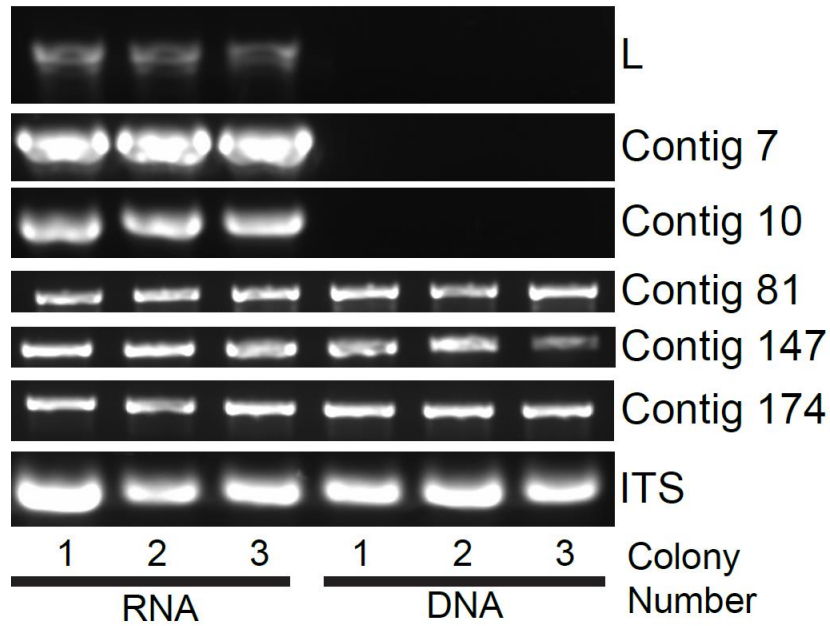
Figure 3.8. *Penicillium* discovirus containing fungus phylogenetically clades among *Penicillium* species. Phylogenetic tree was calculated based on ITS sequence

To test for the presence of the L segment of Discovirus in these colonies, we isolated RNA from 3 independent colonies of *P. atrementosum* St. Louis, and the presence of the L was confirmed in each colony by RT-PCR (Figure 3.9A). By contrast, RNA from the reference *Penicillium chrysogenum* strain (ATCC 10106) was negative for L (Figure 3.9B). Next, we tested for the presence of the other five candidate contigs (contigs 7, 10, 81, 147, and 174) by RT-PCR and all five were present in *P. atrementosum* St. Louis but again absent from *Penicillium chrysogenum*. Testing by PCR of DNA extracted from the fungus gave bands for contigs 81, 147 and 174 suggesting they originated from DNA while contigs 7 and 10 were derived from RNA. Because all known bunya-like viruses have RNA genomes and lack a DNA stage, these data support the possibility that contigs 7 and 10 were distinct segments of Discovirus.

Using the isolated total RNA from *P. atremetosum* St. Louis, the L segment and contigs 7 and 10 were extended by RT-PCR and 3' RACE. We determined that both the 3' and 5' termini of all 3 segments contained a conserved (5'-TGGGGTGCTTTGTGT-3') motif. The eight most 5' terminal nucleotides, 5'-CTTTGTGT-3', were shared with both the phleboviruses and tenuiviruses. The conserved terminal nucleotide sequences among the segments is 15 nucleotides in length, consistent with other tenuiviruses and phleboviruses, in which the terminal segment sequences within a specific species share longer conservation than the eight conserved within the genus. Taken together, this suggests that all 3 of these contigs are in fact viral and belong to the same virus. Bunyavirus segments are labeled based on their length, with the longest segment labeled as the L segment, the middle length labeled as the M segment and the smallest segment labeled as the S segment; we use this nomenclature to represent the segments of Discovirus. The L segment is 6494 nucleotides long, the M segment is 1320 nucleotides long, and S segment is 1181 nucleotides long (Genbank Accession numbers MF142458-MF142460). Also, because fungal viruses include their hosts' name, we refer to the virus as "Penicillium discovirus" henceforth.

a.

Penicillium atramentosum Saint Louis



b.

Penicillium chrysogenum

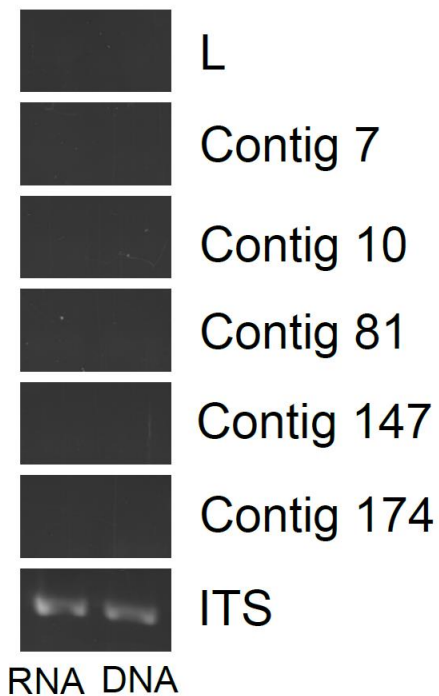


Figure 3.9. Detection of Discovirus genome segments in isolated *Penicillium* (a) RT-PCR of the Discovirus L segment from multiple colonies of the isolated *Penicillium* fungus and a control reference *Penicillium chrysogenum* strain (b) RT-PCR from RNA and conventional PCR from DNA of putative Discovirus segments

Penicillium discovirus is vertically transmitted via sporulation

As all known bunyaviruses and tenuiviruses are transmitted via arthropod vectors, while most fungal viruses are transmitted vertically, we sought to elucidate the transmission of *Penicillium discovirus*. We assessed whether *Penicillium discovirus* could be vertically transmitted through germination of *P. atremetosum* St. Louis. Spores were isolated and passaged for three generations. Fungal RNA was isolated at each generation, and was assessed for all three segments of *Penicillium discovirus* using RT-PCR. In parallel, we passaged spores of *P. chrysogenum* for three generations and also tested each generation for all three *Penicillium discovirus* segments. Every generation of *P. atremetosum* St. Louis contained detectable levels of each viral segment, whereas no generation of *P. chrysogenum* contained any segment of *Penicillium discovirus* (Figure 3.10A). Although *Penicillium discovirus* is transmitted vertically through spores, it is possible that not every daughter spore carries *Penicillium discovirus*. To assess how frequently *Penicillium discovirus* gets packaged into spores, we performed a limiting dilution assay with the spore filtrate. Eight single spore derived cultures were analyzed by isolating RNA and using RT-PCR to test for all three segments. All eight *Penicillium* colonies contained all three segments of *Penicillium discovirus* (Figure 3.10B).

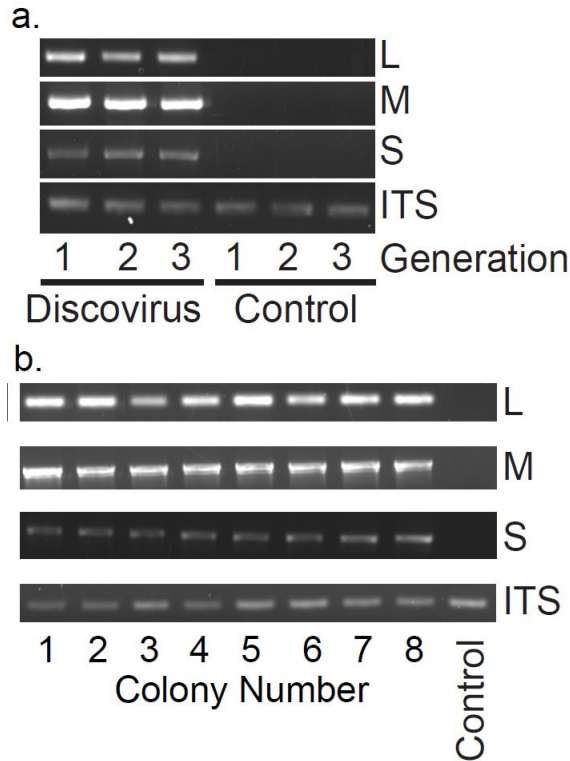


Figure 3.10. Penicillium discovirus is maintained for multiple generations of Penicillium (a) Penicillium spores were filter purified and plated for three generations. Each generation was tested for Penicillium discovirus RNA using RT-PCR. In parallel, Penicillium chrysogenum spores were also passaged for 3 generations, and each generation was tested for Penicillium discovirus (b) Limiting dilution of Penicillium atramentosum spores shows that each spore contained Penicillium discovirus.

Viral sequences related to Penicillium discovirus are widespread in fungal and plant

transcriptome datasets

Given the extreme sequence divergence of Penicillium discovirus to known viruses and the fact that we were unable to align M or S segment sequence to reference databases using BLAST, we hypothesized that viruses related to Penicillium discovirus were likely to be present in other RNA sequencing datasets but were unrecognized. The logical candidate datasets were fungal RNA transcriptomes, and plant transcriptomic datasets, as fungi can often live inside plants. We queried 9,695 publically available fungal transcriptome and 39,962 plant transcriptome studies from the NCBI sequence read archive by tBLASTn with the amino acid sequences of Penicillium discovirus. From these studies, we identified 14 fungal samples that

contained at least one read that aligned to *Penicillium discovirus*. Two samples from a transcriptome of pathogenic *Pseudogymnoascus* species had over 100 reads that aligned to *Penicillium discovirus* (Table 3.3). In addition 267 plant samples contained at least one read that aligned to *Penicillium discovirus*. To better characterize the genomes of these putative novel Discoviruses, we assembled transcriptomic datasets that contained at least 50 reads that aligned to *Penicillium discovirus*. Twenty-one unique contigs larger than 500 nucleotides (up to 6464 nt) were generated. 13 contigs contained translation frames that aligned to the L segment ORF, 4 contigs contained translation frames that aligned to the M segment ORF and 4 contigs contained translation frames that aligned to the S segment (Table 3.4). Only plant transcriptomic datasets yielded sufficiently long contigs, including some agriculturally important plants^{18,19}. These contigs range from 28-76% amino acid identity to *Penicillium Discovirus*, suggesting these are distinct viruses from *Penicillium discovirus*. These viruses were distributed on at least three continents (North America, Europe and Australia), and all the host plants associated with Discoviruses were angiosperms.

Table 3.3. *Penicillium discovirus* like sequences found in other fungi and plants.

SRA Accession	Kingdom	Species	Number of Reads that Align to		
			L	M	S
SRR1956747	Fungi	<i>Pseudogymnoascus</i> sp. 03VT05	100	57	45
SRR1956737	Fungi	<i>Pseudogymnoascus</i> sp. 03VT05	68	31	24
SRR592710	Fungi	<i>Penicillium digitatum</i>	15	0	1
SRR592713	Fungi	<i>Penicillium digitatum</i>	0	0	13
DRR017631	Fungi	<i>Rhizophagus</i> sp. strain HR1	4	0	2
DRR017627	Fungi	<i>Rhizophagus</i> sp. strain HR1	1	0	2
SRR807362	Fungi	<i>Locusta migratoria</i>	3	0	0
SRR1587811	Fungi	<i>Fabomonas tropica</i>	2	0	0
SRR1066785	Fungi	<i>Aspergillus flavus</i> NRRL3357	0	0	2
SRR1575394	Fungi	<i>Fabomonas tropica</i>	0	2	0
DRR017629	Fungi	<i>Rhizophagus</i> sp. strain HR1	1	0	0
ERR637976	Fungi	<i>Schizosaccharomyces pombe</i>	1	0	0

SRR1695880	Fungi	Pseudophialophora eragrostis	0	1	0
DRR017626	Fungi	Rhizophagus sp. strain HR1	1	0	0
SRR1005294	Plant	Oryza sativa	1795	901	1153
SRR1005257	Plant	Oryza sativa	310	144	220
SRR1005271	Plant	Oryza sativa	155	70	90
ERR1059554	Plant	Vitis vinifera	158	0	57
SRR1005260	Plant	Oryza sativa	99	46	50
ERR777826	Plant	Cleome gynandra	130	0	0
ERR1059557	Plant	Vitis vinifera	81	2	43
ERR1059556	Plant	Vitis vinifera	53	0	61
SRR1005300	Plant	Oryza sativa	50	24	18
SRR3105700	Plant	Lilium	44	0	43
SRR1005312	Plant	Oryza sativa	42	10	34
SRR1005311	Plant	Oryza sativa	28	24	24
SRR1005267	Plant	Oryza sativa	22	26	26
SRR1005301	Plant	Oryza sativa	20	26	21
SRR1005310	Plant	Oryza sativa	24	16	18
SRR1999956	Plant	Nepenthes rafflesiana	29	0	24
SRR1005259	Plant	Oryza sativa	22	22	8
ERR1059555	Plant	Vitis vinifera	41	0	10
SRR1005303	Plant	Oryza sativa	13	10	22
SRR1005296	Plant	Oryza sativa	18	6	20
SRR1005307	Plant	Oryza sativa	22	14	8
SRR1005298	Plant	Oryza sativa	20	8	12
ERR1059553	Plant	Vitis vinifera	29	0	9
SRR1005306	Plant	Oryza sativa	16	9	10
SRR1233165	Plant	Solanum commersonii	14	3	12
SRR1213587	Plant	Oryza sativa Japonica Group	29	0	0
SRR2131364	Plant	Oryza sativa	3	0	25
SRR960254	Plant	Gossypium hirsutum	16	0	12
SRR1005315	Plant	Oryza sativa	8	6	10
SRR960252	Plant	Gossypium hirsutum	14	0	7
SRR3217257	Plant	Panicum virgatum cultivar:Alamo-AP13	19	0	2
SRR1005320	Plant	Oryza sativa	4	12	4
SRR1005317	Plant	Oryza sativa	16	4	0
SRR2131365	Plant	Oryza sativa	1	0	19
SRR1005318	Plant	Oryza sativa	2	8	9
SRR2807659	Plant	Dionaea muscipula	17	0	2
SRR2187589	Plant	Arabidopsis thaliana	19	0	0
SRR1005261	Plant	Oryza sativa	11	2	4
SRR1233161	Plant	Solanum commersonii	8	4	5
SRR1174777	Plant	Oryza glumipatula	13	0	4

SRR2187590	Plant	Arabidopsis thaliana	17	0	0
SRR1005299	Plant	Oryza sativa	6	4	6
SRR1005308	Plant	Oryza sativa	8	4	4
SRR2131352	Plant	Oryza sativa	2	0	14
SRR1724091	Plant	Arabidopsis thaliana	12	0	4
SRR1298983	Plant	Cicer arietinum	12	0	4
SRR1174792	Plant	Oryza meridionalis	6	2	6
SRR2003671	Plant	Brassica rapa	8	4	2
SRR2240273	Plant	Arabidopsis thaliana	14	0	0
SRR2807657	Plant	Dionaea muscipula	13	0	0
ERR748774	Plant	Oryza sativa Japonica Group	13	0	0
SRR1531164	Plant	Heliopsis helianthoides	8	0	4
ERR748773	Plant	Oryza sativa Japonica Group	11	1	0
SRR3217256	Plant	Panicum virgatum	12	0	0
SRR1005280	Plant	Oryza sativa	6	2	3
SRR2240260	Plant	Arabidopsis thaliana	9	0	2
SRR2131363	Plant	Oryza sativa	2	0	9
SRR1005289	Plant	Oryza sativa	6	2	2
SRR1005284	Plant	Oryza sativa	6	4	0
SRR1005258	Plant	Oryza sativa	8	0	2
SRR2807661	Plant	Dionaea muscipula	5	1	4
SRR2131351	Plant	Oryza sativa	1	0	9
SRR1178919	Plant	Oryza granulata	9	0	1
SRR1731532	Plant	Triticum aestivum	8	0	1
SRR1722393	Plant	Triticum aestivum	8	0	1
SRR2807660	Plant	Dionaea muscipula	6	0	3
SRR1302046	Plant	Vitis vinifera	4	0	5
SRR2132800	Plant	Musa acuminata	8	0	1
ERR748777	Plant	Oryza sativa Japonica Group	9	0	0
SRR1005309	Plant	Oryza sativa	4	2	2
SRR1005297	Plant	Oryza sativa	4	2	2
SRR2807662	Plant	Dionaea muscipula	8	0	0
SRR3046431	Plant	Vitis vinifera	6	0	1
ERR1360188	Plant	Triticum aestivum	3	0	4
SRR1778927	Plant	Quercus rubra	7	0	0
SRR3156503	Plant	Citrullus lanatus	7	0	0
SRR1005343	Plant	Oryza sativa	2	2	2
SRR1005276	Plant	Oryza sativa	6	0	0
SRR1005323	Plant	Oryza sativa	6	0	0
ERR260429	Plant	Picea abies	6	0	0
SRR1837885	Plant	Zea mays	4	0	2
SRR926248	Plant	Picea glauca	5	1	0

SRR1562369	Plant	<i>Lindera glauca</i>	6	0	0
SRR1005287	Plant	<i>Oryza sativa</i>	3	2	0
SRR1005277	Plant	<i>Oryza sativa</i>	5	0	0
SRR1005291	Plant	<i>Oryza sativa</i>	5	0	0
SRR2807658	Plant	<i>Dionaea muscipula</i>	2	2	1
SRR1917043	Plant	<i>Dendrobium catenatum</i>	2	1	2
SRR3046430	Plant	<i>Vitis vinifera</i>	4	0	1
SRR1779073	Plant	<i>Juglans nigra</i>	4	0	1
SRR866531	Plant	<i>Vitis vinifera</i>	4	0	1
SRR1005314	Plant	<i>Oryza sativa</i>	2	2	0
SRR1005286	Plant	<i>Oryza sativa</i>	2	2	0
SRR1005273	Plant	<i>Oryza sativa</i>	2	2	0
SRR1005268	Plant	<i>Oryza sativa</i>	2	2	0
SRR1005313	Plant	<i>Oryza sativa</i>	4	0	0
SRR1005292	Plant	<i>Oryza sativa</i>	4	0	0
SRR1005373	Plant	<i>Oryza sativa</i>	2	0	2
SRR1005304	Plant	<i>Oryza sativa</i>	2	2	0
SRR1005263	Plant	<i>Oryza sativa</i>	4	0	0
SRR1506121	Plant	<i>Pinus flexilis</i>	2	0	2
SRR1178935	Plant	<i>Oryza australiensis</i>	3	0	1
SRR1611790	Plant	<i>Hevea brasiliensis</i>	3	0	1
SRR1588453	Plant	<i>Physcomitrella patens</i>	2	2	0
SRR1233164	Plant	<i>Solanum commersonii</i>	2	0	2
SRR1778932	Plant	<i>Quercus rubra</i>	2	0	2
ERR1059552	Plant	<i>Vitis vinifera</i>	3	0	1
SRR3046429	Plant	<i>Vitis vinifera</i>	4	0	0
SRR2127986	Plant	<i>Dipteronia sinensis</i>	4	0	0
SRR2477711	Plant	<i>Orobancha aegyptiaca</i>	4	0	0
SRR1778989	Plant	<i>Quercus rubra</i>	4	0	0
SRR2148997	Plant	<i>Daucus carota</i> subsp. <i>sativus</i>	4	0	0
SRR1778921	Plant	<i>Quercus rubra</i>	4	0	0
SRR1619672	Plant	<i>Narcissus pseudonarcissus</i>	4	0	0
SRR1618547	Plant	<i>Oryza sativa</i>	4	0	0
SRR1257400	Plant	<i>Arabidopsis thaliana</i>	4	0	0
ERR748785	Plant	<i>Oryza sativa Japonica Group</i>	4	0	0
ERR167173	Plant	<i>Quercus suber</i>	4	0	0
SRR1257399	Plant	<i>Arabidopsis thaliana</i>	4	0	0
ERR424752	Plant	<i>Triticum aestivum</i>	4	0	0
SRR960261	Plant	<i>Gossypium hirsutum</i>	4	0	0
ERR493373	Plant	<i>Malus domestica</i>	4	0	0
SRR3208051	Plant	<i>Populus trichocarpa</i>	2	0	1
SRR1162293	Plant	<i>Cleome gynandra</i>	2	0	1

SRR2976057	Plant	Ananas comosus	1	0	2
SRR1778924	Plant	Quercus rubra	2	0	1
SRR1958771	Plant	Triticum aestivum	3	0	0
SRR1162292	Plant	Cleome gynandra	3	0	0
SRR1174772	Plant	Oryza glumipatula	3	0	0
SRR1026209	Plant	Oryza sativa	3	0	0
ERR167181	Plant	Quercus suber	3	0	0
SRR1588171	Plant	Camellia sinensis	3	0	0
SRR1233160	Plant	Solanum commersonii	3	0	0
SRR1212862	Plant	Citrus x paradisi x Citrus trifoliata	3	0	0
SRR1026204	Plant	Oryza sativa	3	0	0
ERR886715	Plant	Sorghum bicolor	3	0	0
SRR1257389	Plant	Arabidopsis thaliana	3	0	0
ERR1360192	Plant	Triticum aestivum	3	0	0
ERR777827	Plant	Cleome gynandra	3	0	0
ERR167179	Plant	Quercus suber	3	0	0
SRR960260	Plant	Gossypium hirsutum	3	0	0
ERR167184	Plant	Quercus suber	3	0	0
SRR1005378	Plant	Oryza sativa	2	0	0
SRR1005266	Plant	Oryza sativa	2	0	0
SRR1005265	Plant	Oryza sativa	2	0	0
SRR3046428	Plant	Vitis vinifera	1	0	1
ERR748784	Plant	Oryza sativa Japonica Group	1	0	1
SRR831704	Plant	Triticum aestivum	1	0	1
SRR3207915	Plant	Populus trichocarpa	2	0	0
SRR1170742	Plant	Oryza barthii	2	0	0
SRR2131361	Plant	Oryza sativa	2	0	0
SRR1186869	Plant	Zea mays	2	0	0
SRR3046433	Plant	Vitis vinifera	2	0	0
SRR2003637	Plant	Arabidopsis thaliana	2	0	0
SRR3046432	Plant	Vitis vinifera	2	0	0
SRR2060956	Plant	Gossypium hirsutum	2	0	0
SRR1822494	Plant	Gossypium hirsutum	2	0	0
SRR1652334	Plant	Gossypium barbadense	2	0	0
SRR1649311	Plant	Panax ginseng	2	0	0
SRR1588170	Plant	Hevea brasiliensis	2	0	0
SRR1287024	Plant	Oryza sativa	2	0	0
SRR1257390	Plant	Arabidopsis thaliana	2	0	0
SRR1233166	Plant	Solanum commersonii	2	0	0
SRR1163705	Plant	Tarenaya hassleriana	2	0	0
SRR1162298	Plant	Cleome gynandra	2	0	0
ERR1025478	Plant	Salix viminalis	2	0	0

SRR1163703	Plant	Tarenaya hassleriana	2	0	0
ERR179753	Plant	Capsicum annuum	2	0	0
SRR3046440	Plant	Vitis quinquangularis	2	0	0
SRR2094397	Plant	Oropetium thomaeum	2	0	0
SRR2081043	Plant	Gossypium hirsutum	2	0	0
SRR1298984	Plant	Cicer arietinum	2	0	0
ERR1360179	Plant	Triticum aestivum	2	0	0
SRR2807652	Plant	Dionaea muscipula	2	0	0
ERR929878	Plant	Primula vulgaris	2	0	0
ERR829294	Plant	Solanum tuberosum	2	0	0
DRR001017	Plant	Secale cereale	2	0	0
SRR3310309	Plant	Cucumis sativus	2	0	0
SRR2676906	Plant	Camellia reticulata	2	0	0
SRR1942951	Plant	Warburgia ugandensis	2	0	0
SRR1797599	Plant	Camellia taliensis	2	0	0
SRR1720767	Plant	Colobanthus quitensis	2	0	0
SRR1413312	Plant	Paphiopedilum callosum	2	0	0
SRR1185546	Plant	Araucaria angustifolia	2	0	0
SRR959508	Plant	Gossypium arboreum	2	0	0
SRR1564725	Plant	Ziziphus jujuba	2	0	0
SRR1162294	Plant	Cleome gynandra	2	0	0
SRR1720760	Plant	Colobanthus quitensis	2	0	0
DRR001451	Plant	Oryza rufipogon	2	0	0
SRR826599	Plant	Helianthus argophyllus	2	0	0
SRR1594527	Plant	Bougainvillea stipitata var. grisebachiana	2	0	0
SRR653057	Plant	Oryza sativa	2	0	0
SRR606404	Plant	Oryza sativa	2	0	0
SRR3110670	Plant	Panicum hallii	1	0	0
SRR3096280	Plant	Festuca pratensis	1	0	0
SRR2477712	Plant	Orobanche aegyptiaca	1	0	0
SRR2040570	Plant	Oryza sativa	1	0	0
SRR1837875	Plant	Zea mays	1	0	0
SRR3204831	Plant	Pisum sativum	1	0	0
SRR3124526	Plant	Camellia oleifera	1	0	0
SRR3112066	Plant	Panicum hallii	1	0	0
SRR3046448	Plant	Vitis quinquangularis	1	0	0
SRR2807630	Plant	Dionaea muscipula	1	0	0
SRR1927120	Plant	Vitis vinifera	1	0	0
SRR1778920	Plant	Quercus rubra	1	0	0
SRR1728120	Plant	Triticum aestivum	1	0	0
SRR1537559	Plant	Oryza sativa	1	0	0
ERR1104413	Plant	Salix purpurea	1	0	0

SRR3207877	Plant	Populus trichocarpa	1	0	0
SRR2807626	Plant	Dionaea muscipula	1	0	0
SRR2240272	Plant	Arabidopsis thaliana	1	0	0
SRR2167610	Plant	Chrysopogon zizanioides	1	0	0
SRR1770420	Plant	Olea europaea	1	0	0
SRR1582386	Plant	Musa acuminata	1	0	0
SRR1537557	Plant	Oryza sativa	1	0	0
SRR1213697	Plant	Oryza sativa Japonica Group	1	0	0
SRR1055109	Plant	Camellia sinensis	1	0	0
SRR1033742	Plant	Citrus x paradisi x Citrus trifoliata	1	0	0
SRR1033317	Plant	Citrus x paradisi x Citrus trifoliata	1	0	0
SRR3105600	Plant	Tulipa gesneriana	1	0	0
SRR2321320	Plant	Festuca arundinacea	1	0	0
SRR2240261	Plant	Arabidopsis thaliana	1	0	0
SRR2120782	Plant	Vitis vinifera	1	0	0
SRR1909493	Plant	Dendrobium catenatum	1	0	0
SRR1537552	Plant	Oryza sativa	1	0	0
SRR1266998	Plant	Howea belmoreana	1	0	0
SRR1026739	Plant	Vitis riparia x Vitis rupestris	1	0	0
SRR1026335	Plant	Vitis riparia x Vitis rupestris	1	0	0
SRR3207796	Plant	Populus trichocarpa	1	0	0
SRR2984592	Plant	Musa acuminata AAA Group	1	0	0
SRR2824359	Plant	Litchi chinensis	1	0	0
SRR2003659	Plant	Arabidopsis thaliana	1	0	0
SRR2003632	Plant	Arabidopsis thaliana	1	0	0
SRR1837717	Plant	Zea mays	1	0	0
SRR1770102	Plant	Zea mays	1	0	0
SRR1724901	Plant	Citrullus lanatus	1	0	0
SRR1724088	Plant	Arabidopsis thaliana	1	0	0
SRR1698111	Plant	Zea nicaraguensis	1	0	0
SRR1267019	Plant	Howea belmoreana	1	0	0
SRR1182649	Plant	Panicum virgatum	1	0	0
SRR1170971	Plant	Solanum tuberosum	1	0	0
SRR1162297	Plant	Cleome gynandra	1	0	0
SRR1026338	Plant	Vitis riparia x Vitis rupestris	1	0	0
SRR3207913	Plant	Populus trichocarpa	1	0	0
SRR1830868	Plant	Araucaria cunninghamii	1	0	0
SRR826644	Plant	Helianthus debilis	1	0	0
SRR912597	Plant	Zea mays	1	0	0
SRR837659	Plant	Brassica rapa	1	0	0
SRR826645	Plant	Helianthus debilis	1	0	0
SRR653062	Plant	Oryza sativa	1	0	0

SRR606409	Plant	Oryza sativa	1	0	0
ERR908395	Plant	Fagus sylvatica	1	0	0
ERR908392	Plant	Fagus sylvatica	1	0	0
ERR690823	Plant	Campanula aff. rotundifolia CAM084	1	0	0
ERR424755	Plant	Triticum aestivum	1	0	0
DRR029010	Plant	Sarracenia purpurea subsp. Venosa	1	0	0
SRR447121	Plant	Oryza sativa Japonica Group	1	0	0
ERR908410	Plant	Fagus sylvatica	1	0	0
ERR789951	Plant	Oryza sativa	1	0	0
ERR748783	Plant	Oryza sativa Japonica Group	1	0	0
ERR424731	Plant	Triticum aestivum	1	0	0
DRR006301	Plant	Allium fistulosum	1	0	0
SRR867435	Plant	Citrus sinensis	1	0	0
ERR260421	Plant	Picea abies	1	0	0
SRR952307	Plant	Notholithocarpus densiflorus var. densiflorus	1	0	0
ERR908403	Plant	Fagus sylvatica	1	0	0
ERR367938	Plant	Hordeum vulgare subsp. spontaneum	1	0	0

Table 3.4. Penicillium discovirus like contigs assembled from SRA samples.

Host Kingdom	Host	SRA Accession Number	Number of Contigs that Align to:			Length of Largest Contig (nt)			Amino Acid Percent Identity of Longest Contig to Penicillium discovirus		
			L	M	S	L	M	S	L	M	S
Plant	Oryza Sativa	SRR1005294	1	1	1	6464	1253	1156	76	57	68
Plant	Oryza Sativa	SRR2131364	2	0	0	5360	0	0	27	0	0
Plant	Vitis Vinifera	ERR1059554	1	1	1	2389	1892	894	53	28	35
Plant	Nepenthes rafflesiana	SRR1999956	7	1	1	1232	1960	1126	29	40	44
Plant	Lilium cultivar "McAleese"	SRR3105700	2	1	1	3034	1532	1246	32	35	41

Discussion

Viral metagenomics has traditionally been dependent upon primary sequence alignment methods to identify highly divergent viruses. While recent reports have shown that nucleotide k-mer based computational methods are sufficient to classify bacterial and other microbial sequences, no method has applied this approach to broadly identify all classes of eukaryotic viral sequences¹⁰. Here, we present DiscoVir, a k-mer based computation approach capable of identify

viral sequences independent of primary sequence alignment. We show that DiscoVir accurately identifies more viral sequences from highly divergent viral taxa than BLASTx using both *in silico* generated and real sequencing data. DiscoVir provides one modality to address this problem in viral discovery by identifying additional novel viral sequences without alignment. This is an even more challenging problem for certain classes of viruses, such as segmented viruses. For these viruses, independent of sequencing depth, the recovery of one segment does not necessarily lead to the recovery of the full viral genome.

The biological parameters that define k-mer frequencies in viral sequences are not fully understood. There is evidence that some viral taxa partially optimize their codon usage to increase their fitness²⁰. As codons are a specific example of a k-mer, codon bias might be in part why DiscoVir can accurately discriminate sequences. Additional factors such as DNA and RNA methylation likely contribute to the k-mer preference of viral sequences.

Finally, we report the discovery of a novel bunya-like virus, of which two segments had no discernable primary sequence alignment to any known virus. Multiple lines of evidence suggest that these segments are part of the same virus. We found that every colony of the initial fungal culture that we tested contained all three segments. After multiple generations of vertical transmission, all three segments were present in each generations of the fungus, once again, with no fungal culture lacking any of the segments. The extracted fungal DNA did not amplify any of the viral segments, demonstrating that all three of the segments were derived from RNA. Finally, the termini of these segments were conserved with each other as well as with the conserved phlebovirus and tenuivirus termini. This virus persistently infects a *Penicillium* fungus species. To our knowledge, no bunya-like virus of fungi have been described. Furthermore, we identified related viral reads and contigs present in an independent fungal and plant sequencing datasets,

suggesting that *Penicillium discovirus* is the prototype of a novel genus of bunya-like viruses that infect fungi.

Bunyaviruses are thought to be transmitted via arthropods to plant or mammalian hosts. However, we demonstrated that *Penicillium discovirus* employed a transmission pattern previously unobserved in bunyaviruses, vertical transmission via fungal sporulation. This finding demonstrates that highly divergent viruses identified using DiscoVir can broaden our understanding of viral biology.

As this *Penicillium* species was found in a patient serum sample, it raises the possibility that this fungus is a novel pathogen of humans; while *Penicillium* fungi are not typically thought to be pathogenic, there is one species, *P. marnefeyi*, that infects humans in the context of HIV infection²¹. If this *Penicillium* in fact did infect this patient, it is possible *Penicillium discovirus* could represent a virulence factor for this *Penicillium* species, analogous to the Leishmania viruses in *Leishmania major*²². Future studies where an isogenic strain of *Penicillium* that lacks this virus is available will not only assist in understanding the phenotypic effects of *Penicillium discovirus* on the fungus, but also will enable a broader understanding of how mammalian host differentially responds to this fungus when co-infected with *Penicillium discovirus*. DiscoVir might elucidate the presence of novel viruses in patient samples, and these viruses might play causative roles in disease.

Online Methods:

Taxonomic defined, reference nucleotide datasets

DiscoVir is designed to predict viral sequences by training SVMs on sequences of known taxonomic origin, specifically either from eukaryotic viral, bacterial or fungal genomes. Viral and bacterial sequences were retrieved from the NCBI RefSeq Genomes Database on September

2016. Fungal genomes were retrieved from the IMG/M Data Warehouse from the Joint Genome Institute on November 2015²³. Each genome was taxonomically annotated based on NCBI taxonomic definitions (Appendix 2). For each taxon, a simulated set of short genomic sequences were randomly generated from genomes within that taxon by tiling across each genome, without overlap, and then subsequently using a random number generator to select simulated sequences for each training set. Each simulated sequence was then compositionally transformed into a vector based on the k-mer frequency in the sequence. In the training set, vectors were labeled either as originating from “Eukaryotic Viruses”, “Bacteria”, or “Fungi”. Binary support vector machines (Fungi-Virus and Bacteria-Virus), were implemented with SVM-light using the radial basis function kernel ($\gamma= 0.001$, $C = 0.051$)²⁴.

Parameter estimation

Bacterial, fungal and viral sequence datasets were each randomly divided into 5 partitions, agnostic of taxonomic representation. Both nucleotide sequence and k-mer length were varied to identify optimal parameters for identifying viral sequences. For each taxon, 50, 100, 200 and 400 nucleotide length sequences were used to simulate short metagenomic sequences. In all cases, a total of 10,000 nucleotides per taxon was used for training (i.e. 25 sequences of 400 nt, 50 sequences of 200 nt, etc). For each length condition, the maximum k-mer lengths used (n) to define k-mer spectra ranged $2 \leq n \leq 8$. Each k-mer condition was hierarchically parameterized: specifically, given a maximum k-mer length (n), the subsequent vector contained the frequencies of all k-mers where $1 \leq k \leq n$. Each SVM model condition was then evaluated using the other partitions not used for training.

Integrating logistic regression

Training data from binary SVMs was applied to both the Fungus-Virus and Bacteria-Virus SVM, and the outputs from these SVMs were used as explanatory variables for logistic regression, implemented using generalized linear models in R.

Leave two taxa out simulated experiment for support vector machine models

To assess how well viral sequences from a putative novel family of viruses could be separated from highly divergent bacterial/fungal sequences using DiscoVir, we modeled sequences from novel viral families by defining 69 top-level taxa from viruses using NCBI Taxonomy accessed on September 2016. Viral taxons were generally defined at the family level, unless clear phylogenetic relationships were evident, in which case orders were used. Additionally, we defined 18 top-level taxa for bacteria and 8 top-level taxa for fungi. The bacterial taxa often corresponded to phyla or superphyla while the fungal taxa often corresponded to subkingdoms or divisions (Appendix 2).

We removed a defined viral taxon and bacterial/fungal taxa from the total dataset and trained new Bacteria-Virus or Fungus-Virus SVM models on the remaining data using 200 bp sequences and $k = 6$. We then tested the accuracy of the resulting model using the removed viral taxon and non-viral partition by applying the data to the newly trained SVM model, and calculated a ROC curve. This was repeated for all viral taxa and all non-viral taxa. We then combined the total data from all the taxa within a given replicate and constructed a ROC curve to assess the accuracy of the model. ROC curves were constructed in R using the ROCR package²⁵. CROC curves were constructed using an alpha = 14 using a CROC package¹⁷.

Leave two taxa out simulated experiment for BLASTx

All viral, bacterial and fungal protein sequences from the NCBI NR database were downloaded on September 2016. For each test viral taxon and bacterial taxon, a protein database

containing all viral and bacterial protein sequences except for the protein sequences from the test viral and bacterial taxon was constructed. The previously defined test set sequences were then aligned to this new protein database, and the highest bit score generated for each sequence was recorded. This was repeated for all viral taxa as defined by Appendix 2. Bit score values from any sequence that aligned to a viral protein were extracted and a ROC curve was constructed using bit-score as a discriminator.

Implementation

DiscoVir is written in perl, with the exception of the support vector machine implementation, which relies on the pre-compiled SVM-light classifier. Fasta formatted sequences are first transformed into k-mer space and represented in a sparse vector format, using HexanucleotideUnmapped.pl, which creates a text file with the extension “SVMReady”. By default, DiscoVir transforms inputted nucleotide sequences into k-mer space depending on nucleotide length: 200-239 length sequences are processed into a 200 nucleotide length subsequence, 240-399 length sequences are processed into a 200 nucleotide length subsequences using a sliding window approach with a spacing of 40 nucleotides between each subsequence, 400-439 length sequences are processed into 400 nucleotide length subsequences, and sequences that are 440 nucleotides or longer are processed into 400 nucleotide length subsequences using a sliding window approach with a spacing of 40 nucleotides between each subsequence. Each k-mer transformed sequence retains the fasta label of the original sequence, denoted by a pound sign at the line terminus. SVMReady files are then processed with the Bacteria-Virus and Fungi-Virus models using the independently executable SVM-light program, svm_classify, resulting in a text based output file that contains the SVM score for each sequence. For input sequences between 240-399 nucleotides or longer than 440, the arithmetic mean of the

DiscoVir output score of all the sliding windows is used to define the score of the input sequence. The outputs from both Bacteria-Virus Fungus-Virus SVM models are then combined using a trained logistic regression, outputting a final score, which represents a logit of the probability that a sequence is from virus. Sequences above a user-defined score are then aggregated into a fasta file using the in house script FilterViralReads.pl. DiscoVir and its component parts are available at github.

Illumina sequencing and analysis

Total metagenomic nucleic acid was extracted using Ampliprep (Roche) and subjected to random-priming cDNA synthesis and amplification, and TruSeq (Illumina) libraries were constructed. Libraries were sequenced on an Illumina MiSeq instrument (2 x 250). Reads were filtered for high quality reads (QC30) with Prinseq, clustered using CD-Hit (95% criteria) and aligned to reference protein datasets using BLASTx to known amino acid sequences in the NCBI nr database. Contig assembly on reads was performed with IDBA, with only contigs larger than 500 nucleotides being retained. Contigs that did not align to any known nucleic or amino acid sequence with an e-value $< 10^{-3}$ were defined to be unassigned. The non-human reads from this dataset are deposited at the NCBI Sequence Read Archive (SRA) under PRJNA295349.

Phylogenetic analysis of bunyaviruses and fungi

All RNA-dependent RNA-polymerase amino acid sequences present in the RefSeq database from the *Bunyaviridae* family and the *Tenuivirus* and *Emaravirus* genera were used for phylogenetic analysis. The bunyaviral RdRp domain, as defined by Pfam (Bunya_RdRp, PF04196), was extracted from each sequence. Multiple sequence alignment was performed on the isolated domains using the ClustalW algorithm in MEGA6. Maximum Likelihood phylogenies were performed using 100 bootstraps using the model (LG + I +G). For fungal

phylogenies, Internal Transcribed Spacer (ITS) nucleotide sequences from 20 closely related *Penicillium* species were aligned using the ClustalW algorithm in MEGA6. Maximum Likelihood phylogenies were performed using 100 bootstraps.

Fungal culture conditions

Patient serum was plated on Blood-Heart Infusion Agar (BHI) (Remel) and Saboraud-dextrose agar (SDA) (Remel) at 30°C. Fungal passage in this study was performed by flooding fungal plates with spore solution (15 g/L NaCl in ddH₂O) and filtering the resulting residue through MiraCloth (EMB Millipore). This spore filtrate was quantified using a hemocytometer, and then 10⁵ spores were plated on SDA at 25°C (Sigma). *Penicillium chrysogenum* Thom strain (ATCC 10106) was acquired from ATCC.

Fungal nucleic acid isolation, PCR, RT-PCR, termini sequencing

Fungal RNA was isolated using the Trizol/Chloroform method. 1-step RT-PCR kit (Qiagen) was used for RT-PCR reactions using 0.5 ug of RNA. Both 5' and 3' termini of all segments were sequenced using 3'RACE as previously described²⁶. Briefly, total RNA was polyadenylated (Ambion), column purified (Qiagen RNEasy) and then used as a template in 1-step RT-PCR, using an Oligo-d(T) primer and the primers specified (Table 3.5). For ITS sequencing, fungal DNA was isolated using Phenol/chloroform. Accuprime Taq PCR (Life Technologies) was used to amplify gene specific targets from DNA templates.

Table 3.5. Primers

Name	Sequence
Contig80_81_F	CAATGCATGGAATGGCCTCG
Contig80_81_R	CGTGGGTGGGGATAGAAGTG
Contig80_174_F	GGCGGGCACTAGGACATTAG
Contig80_174_R	AGGAGGGGACTGAGTTGTGA
Contig80_147_F	GAGGAACCTTGAAGCCCTG
Contig80_147_R	GTTTCATGCGCATCCTGGTG
SK-NewBunya-L-1-Fwd	TGGAGCCTCTGCTGATTGG

SK-NewBunya-L-1-Rev	GGGTGAGGGAATGGTCTTGG
SK-NewBunya-L-2-Fwd	TTGGCCTTGACCCACACAAT
SK-NewBunya-L-2-Rev	GCCTGTGACCTCACTATCCG
SK-NewBunya-L-3-Fwd	CGGATAGTGAGGTCACAGGC
SK-NewBunya-L-3-Rev	GTACCTTGCCAACCACTCCA
SK-NewBunya-L-4-Fwd	ACAATGTGCGGCAGTTTCTG
SK-NewBunya-L-4-Rev	GCCGAAAGTCGACCAAGGTA
SK-NewBunya-L-5-Fwd	GATCGGATCACGGACCATGT
SK-NewBunya-L-5-Rev	TATTGATTGCGGCCTTCCCA
SK-NewBunya-L-6-Fwd	CTGAAGGGCCTAATGGGCAA
SK-NewBunya-L-6-Rev	GGTCCGTGATCCGATCTCTT
SK-NewBunya-S-7-Fwd	TTGCAGGACAAGGCGTGATA
SK-NewBunya-S-7-Rev	CGCGGAGGAGCCAGATTTAT
SK-NewBunya-S-8-Fwd	GGAGCATCTGGCTAGGAGTG
SK-NewBunya-S-8-Rev	TCATTGGCCGTTGATGTTGC
SK-NewBunya-S-Out-1	GCCCTGATTGGTGCCATTAG
SK-NewBunya-S-Out-2	TATCACGCCTTGTCTGCAA
SK-NewBunya-L-Out-1	TCCACCCGGTCTATTGATCCA
SK-NewBunya-L-Out-2	GGGATGAAGAAGCAGACAATGA
SK-Bunya-L-Out-1	TTATACACACGGGGTGCTGC
SK-Bunya-L-7-Fwd	ACTCCTCCTCAGACTCACTCA
SK-Bunya-L-7-Rev	TAGACTTGCCAGACAGGGA
SK-Bunya-L-8-Fwd	AATCTCGCTTTGCTTTCCGC
SK-Bunya-L-8-Rev	CCCAGTGGAGATCCCGAAGA
SK-Bunya-L-9-Fwd	TCCCTGTCTGGCCAAGTCTA
SK-Bunya-L-9-Rev	TCAGGTGTTCGGGTCATTGTT
SK-Bunya-L-Out-4	AACAATGACCCGACACCTGA
SK-Bunya-L-7-Fwd2	CCAAATCAGCAGAGGCTCCA
SK-BunyaM-3RACE	TTCGAGGGATCAGCAAACGG
SK-BunyaL-3RACE	GCTTCAAGCTCATGAGATGCT
SK-NewBunyaL-3'RACE1	TCCTCAGACATTCTCTCATGGT
SK-NewBunyaL-3'RACE2	AGTGACACCTCACATACTCTCA
SK-NewBunyaL-5'RACE1	GCTGGTGAAGGTGATCAGGAC
SK-NewBunyaL-5'RACE2	ACGCTCTACATGTGACTTCCA
SK-MidNTR-1	AGCGTCGTGGTTCTTCATCC
SK-MidNTR-2	TTCGAGGGATCAGCAAACGG
SK-SmallNTR-1	CCGGATAAAACACGCGAACG
SK-SmallNTR-2	GAGTGAGATCCCAGACGAGC
SK-NewBunya-Mid-ORF1	atggcatcatacacttcagccc
SK-NewBunya-Mid-ORF2	ctaagaaagaatgctccctaacaggg
SK-NewBunya-S-ORF1	atgtctcaaagctctcaacctttgc
SK-NewBunya-S-ORF2	tcaacgacctggtgattatctcac

SK-Bunya-M1Screen	AATCTGAGGCAAAGTGCGGA
SK-Bunya-M2Screen	ACATGGCTGAACTGGATGCT
SK-Bunya-S1Screen	AGCTCGTCTGGGATCTCACT
SK-Bunya-S2Screen	TTTTGACGCTGCAGAACGTG
SK-Bunya-S-5'End	AGTGAGATCCCAGACGAGCT

Limiting dilution spore assay

Spore filtrate of either *P. atrementosum* St. Louis or *P. chrysogenum* was diluted with spore solution to 0.06 spores/uL. 10 uL was subsequently plated on 12 SDA plates, with an additional 2 SDA plates having only 10 uL of spore solution plated. Of the plates that grew *Penicillium* colonies, the fungus was isolated and then cultured in liquid Sabouraud-dextrose medium for 4 days at 30°C. Total RNA was extracted from the liquid cultured fungus for RT-PCR analysis.

tBLASTn query of SRA deposited databases

Using the command line NCBI SRA tBLASTn, amino acid sequences were queried against deposited nucleotide databases that were annotated as having sequenced fungal RNA. All SRA datasets from fungi and plants were identified by querying the NCBI Taxonomy database using their taxonomic identification number (taxid 4751 and 33090 respectively) (November 2016) and then filtering for sequencing of RNA. These datasets were queried using amino acid sequences derived from all the three genomic segments of *Penicillium discovirus* using tBLASTn with non-default parameters (Appendix 3).

Acknowledgements:

We would like to acknowledge Robert Tesh for his efforts to propagate *Discovirus* in cell lines and animals. Samples used in this study were obtained through a project funded by the

Armed Forces Health Surveillance Branch (AFHSCB) and its Global Emerging Infections
Surveillance (GEIS) section under project #C0166_10_N3

References

- 1 Zaki , A. M., van Boheemen , S., Bestebroer , T. M., Osterhaus , A. D. M. E. & Fouchier , R. A. M. Isolation of a Novel Coronavirus from a Man with Pneumonia in Saudi Arabia. *New England Journal of Medicine* **367**, 1814-1820, doi:10.1056/NEJMoa1211721 (2012).
- 2 Yu , X.-J. *et al.* Fever with Thrombocytopenia Associated with a Novel Bunyavirus in China. *New England Journal of Medicine* **364**, 1523-1532, doi:10.1056/NEJMoa1010095 (2011).
- 3 Marz, M. *et al.* Challenges in RNA Virus Bioinformatics. *Bioinformatics (Oxford, England)*, 1-7 (2014).
- 4 Wan, L., Reinert, G., Sun, F. & Waterman, M. S. Alignment-free sequence comparison (II): theoretical power of comparison statistics. *Journal of computational biology : a journal of computational molecular cell biology* **17**, 1467-1490, doi:10.1089/cmb.2010.0056 (2010).
- 5 Nalbantoglu, O. U., Way, S. F., Hinrichs, S. H. & Sayood, K. RAIPhy: phylogenetic classification of metagenomics samples using iterative refinement of relative abundance index profiles. *BMC bioinformatics* **12**, 41-41, doi:10.1186/1471-2105-12-41 (2011).
- 6 Parks, D. H., MacDonald, N. J. & Beiko, R. G. Classifying short genomic fragments from novel lineages using composition and homology. *BMC bioinformatics* **12**, 328-328, doi:10.1186/1471-2105-12-328 (2011).
- 7 Lim, E. C. *et al.* Trowel: a fast and accurate error correction module for Illumina sequencing reads. *Bioinformatics*, 1-2, doi:10.1093/bioinformatics/btu513 (2014).
- 8 Song, L., Florea, L. & Langmead, B. Lighter: fast and memory-efficient error correction without counting. *Genome biology*, 0-16, doi:10.1101/005579 (2014).
- 9 Kelley, D. R., Schatz, M. C. & Salzberg, S. L. Quake: quality-aware detection and correction of sequencing errors. *Genome biology* **11**, R116-R116, doi:10.1186/gb-2010-11-11-r116 (2010).
- 10 Brady, A. & Salzberg, S. L. Phymm and PhymmBL: metagenomic phylogenetic classification with interpolated Markov models. *Nature methods* **6**, 673-676, doi:10.1038/nmeth.1358 (2009).
- 11 Diaz, N. N., Krause, L., Goesmann, A., Niehaus, K. & Nattkemper, T. W. TACO: taxonomic classification of environmental genomic fragments using a kernelized nearest neighbor approach. *BMC bioinformatics* **10**, 56-56, doi:10.1186/1471-2105-10-56 (2009).
- 12 Segata, N., Waldron, L. & Ballarini, A. Metagenomic microbial community profiling using unique clade-specific marker genes. *Nature Methods* **9**, doi:10.1038/Nmeth.2066 (2012).
- 13 Teeling, H., Waldmann, J., Lombardot, T., Bauer, M. & Glöckner, F. O. TETRA: a web-service and a stand-alone program for the analysis and comparison of tetranucleotide usage patterns in DNA sequences. *BMC bioinformatics* **5**, 163-163, doi:10.1186/1471-2105-5-163 (2004).
- 14 Rosen, G. L. & Lim, T. Y. NBC update: The addition of viral and fungal databases to the Naïve Bayes classification tool. *BMC research notes* **5**, 81-81, doi:10.1186/1756-0500-5-81 (2012).
- 15 Rosen, G. L. & Lim, T. Y. NBC update: The addition of viral and fungal databases to the Naïve Bayes classification tool. *BMC research notes* **5**, 81, doi:10.1186/1756-0500-5-81 (2012).
- 16 Elliot, R. M. & Schmaljohn, C. in *Fields Virology* (eds Peter Howley & David Knipe) (Lippincott Williams & Wilkins, 2013).
- 17 Swamidass, S. J., Azencott, C.-a., Daily, K. & Baldi, P. A CROC stronger than ROC : measuring , visualizing and optimizing early retrieval. **26**, 1348-1356, doi:10.1093/bioinformatics/btq140 (2010).
- 18 Secco, D. *et al.* Spatio-temporal transcript profiling of rice roots and shoots in response to phosphate starvation and recovery. *The Plant cell* **25**, 4285-4304, doi:10.1105/tpc.113.117325 (2013).
- 19 Secco, D. *et al.* Stress induced gene expression drives transient DNA methylation changes at adjacent repetitive elements. 1-26, doi:10.7554/eLife.09343 (2015).

- 20 Jenkins, G. M. & Holmes, E. C. The extent of codon usage bias in human RNA viruses and its evolutionary origin. *Virus Research* **92**, 1-7, doi:10.1016/S0168-1702(02)00309-X (2003).
- 21 Phillips, P. *Penicillium marneffei* part of Southeast Asian AIDS. *JAMA* **276**, 86-87 (1996).
- 22 Ives, A. *et al.* Leishmania RNA virus controls the severity of mucocutaneous leishmaniasis. *Science (New York, N.Y.)* **331**, 775-778, doi:10.1126/science.1199326 (2011).
- 23 Markowitz, V. M. *et al.* IMG 4 version of the integrated microbial genomes comparative analysis system. *Nucleic Acids Research* **42**, 560-567, doi:10.1093/nar/gkt963 (2014).
- 24 Joachims, T., Dortmund, U. & Joachims@cs.uni-dortmund.de, T. 41-56 (1999).
- 25 Sing, T., Sander, O., Beerenwinkel, N. & Lengauer, T. ROCr: visualizing classifier performance in R. *Bioinformatics (Oxford, England)* **21**, 3940-3941, doi:10.1093/bioinformatics/bti623 (2005).
- 26 Krishnamurthy, S. R., Janowski, A. B., Zhao, G., Barouch, D. & Wang, D. Hyperexpansion of RNA Bacteriophage Diversity. *PLOS Biology* **14**, e1002409, doi:10.1371/journal.pbio.1002409 (2016).

4. Identifying RNA Phage Resistance Genes

Introduction:

For almost every major taxonomic clade that has known RNA viruses, there are also counteracting anti-viral mechanisms that hosts encode to antagonize these viruses¹. These mechanisms include RIG-I/MDA-5 in mammals, and RNAi in plants, arthropods and worms. However, at this time, there are no known mechanisms that inhibit RNA bacteriophages in bacteria. This gap in knowledge is particularly anomalous, as there are numerous well-established bacterial resistance genes effective against DNA phages².

Escherichia virus Q β and MS2 are the classical RNA bacteriophages used for experimentation³. They are part of the ssRNA bacteriophage family the *Leviviridae* and each encode 4 proteins⁴. All leviviruses are thought to use pili to enter bacterial cells; however the receptors for only 3 leviviruses have been identified⁵⁻⁷. Although both Q β and MS2 use the F-pilus to enter *Escherichia coli* cells, they are distinct species of phages, relying on a number of different host factors for their lifecycle⁸. Although studies have looked for natural bacterial variants that are able to resist phage infection, currently, the only known mechanism by which bacterial cells resist RNA bacteriophage infection is by losing the phage entry receptor, which in the case of Q β and MS2 is the F-pilus⁹. Loss of pilus function is thought to come in the form of hypopilation, in which there is lower cell surface expression of pili, or hyperpilation, in which there is a higher density of pili on the cell surface, likely because the pili are unable to retract back into the bacteria¹⁰.

In this chapter, I detail my efforts on attempting to identify genes that can confer resistance to RNA bacteriophage. To do this, I performed a functional metagenomic screen in which I expressed a library of metagenomic DNA in a susceptible strain of *E. coli* and selected for genes that conferred resistance to Q β infection. While we still cannot conclude that any of the genes identified from this study are directly antagonizing RNA bacteriophage infection instead of altering the pilus expression, we certainly have isolated genes that phenotypically do confer an RNA bacteriophage resistance phenotype

to bacteria. These data therefore present an optimistic view that our screening strategy might still be useful in identifying RNA bacteriophage resistance genes.

Results:

A functional metagenomic screen identified antiviral candidate genes

To identify genes that can restrict RNA bacteriophages, I have employed a functional metagenomics approach. This approach involves extracting and expressing a library of metagenomic DNA fragments within a tractable *E. coli* model (HfrH dhuA) in which each bacterium expresses a sequence fragment from a member of the microbiome. This population can then be challenged with the RNA bacteriophage, Escherichia virus Q β , which will lyse non-resistant bacteria and leave only functionally resistant bacteria. The expressed metagenomic DNA fragments conferring functional resistance is then subsequently sequenced, resulting in the identification of metagenomic DNA fragments that confer resistance to RNA bacteriophages. I used a previously generated metagenomic library developed by the Dantas lab, to identify novel RNA bacteriophage resistance genes. To control for fragments that induced cell growth as opposed to conferring phage resistance, I included a set of bacteria that was transformed with the same set of metagenomic fragments but were not infected with Q β . Additionally, to ensure any resistance phenotype we observed in the screen was being conferred by the plasmid and not a background mutation on the *E. coli* genome, we performed the Q β screen serially three times, isolating the plasmids selected from the previous infection to use in the next one. To account for these controls, multiple inclusion criteria were set to define a metagenomic fragment as possibly antiviral:

- The fragment must be represented in the third selection group
- The fragment must contain be ten times more abundant in the third selection than in the first selection
- The fragment must increase in relative abundance with each subsequent selection

- The fragment must be larger than 500 base pairs

From this screen, we identified 4 fragments that were significantly enriched in the phage treated populations: a spore maturation protein (SpoM) from a *Prevotella* species, a helicase domain containing gene that is distantly related to one from a *Clostridium* species, a Major facilitator superfamily transporter from *Megasphaera eldensii*, and a M16 Peptidase from a *Clostridium* species (Figure 4.1). None of these genes have been previously characterized, but they are related to genes that do have functional annotations.

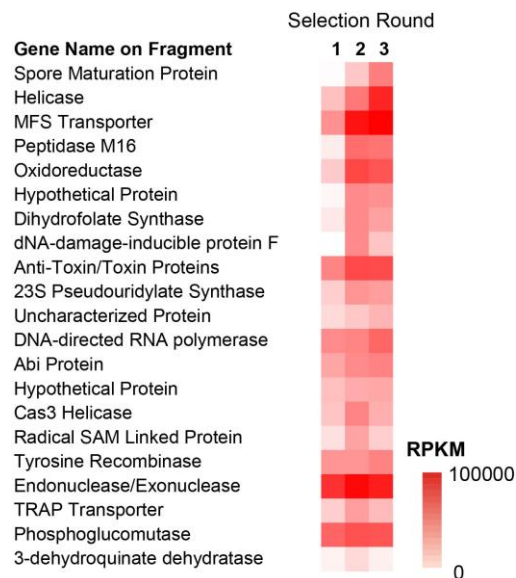


Figure 4.1. RPKM abundance of metagenomic fragments in each selection round.

Metagenomic fragments protect cells from Q β and MS2 infection but not C-1

To validate whether these genes could confer a resistance phenotype to *E. coli*, we overexpressed these genes in HfrH dhuA and monitored bacterial density in the context of Q β and MS2. Normally, when a susceptible population of bacteria is infected with phage, there is a point at which phage lysis outpaces bacterial cell growth. However, I found that when any of these 4 fragments were overexpressed in *E. coli*, the phage lysis never outpaced cell growth and thus displayed the same growth kinetics as uninfected bacteria (Figure 4.2). This lack of lysis suggests that these genes can confer resistance to Q β infection.

We similarly found that all four fragments could confer resistance to MS2 infection. To assess how broadly protective these fragments were to other RNA bacteriophages that did not have the same receptor and host background as Q β and MS2, I overexpressed these genes in a different strain of *E. coli*, JE1, that is susceptible to the RNA bacteriophage C-1¹¹. I then monitored bacterial density in the context of C-1 phage. None of the four genes provided any resistance to C-1 phage.

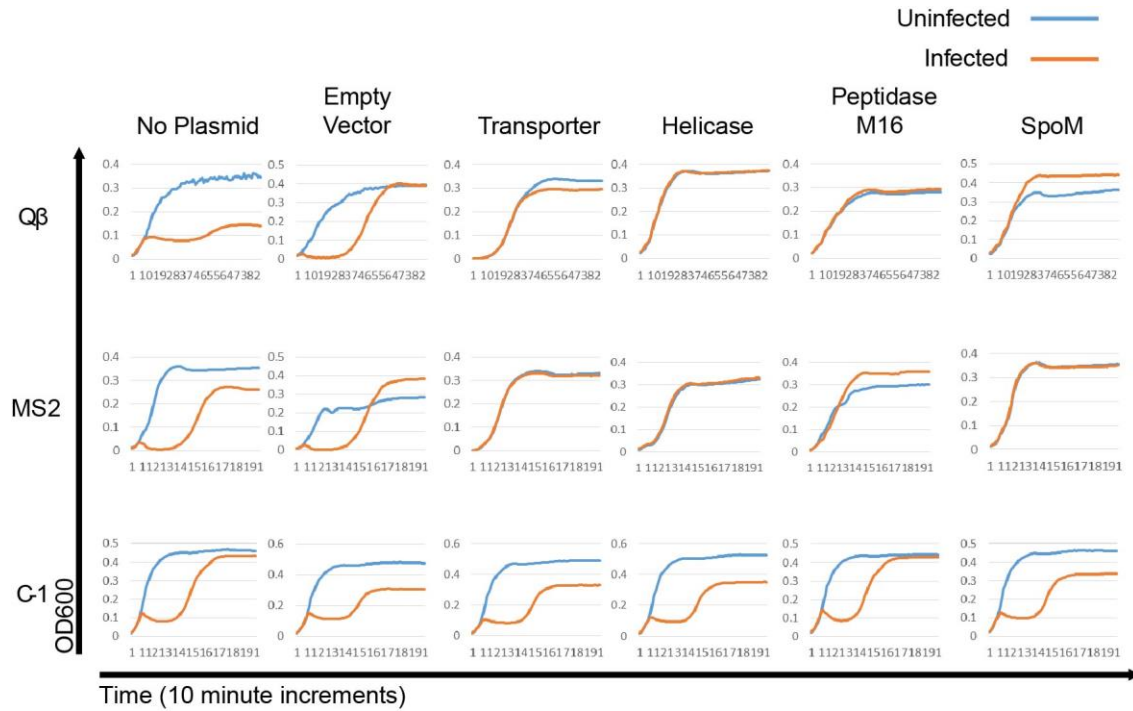


Figure 4.2. Q β , MS2 and C-1 infection curves with overexpressed metagenomic fragments

Metagenomic fragments inhibits plaquing of F pilus specific phages but not C-1

To assess whether any of these metagenomic fragments could inhibit the production of infectious RNA bacteriophages, we measured the efficiency of plating of Q β and MS2 in the HfrH cells overexpressing these metagenomic fragments. Both Q β and MS2 phage production was completely blocked by the overexpression of any of the four fragments (Figure 4.3). Similarly, to assess whether these fragments could inhibit the production of more distantly related phages, we measured the efficiency of plating of C-1 in JE1 cells overexpressing these fragments. We found that none of the fragments

affected the production of C-1 phages from JE1 cells. This complete block in phage production and lysis exclusively in Q β and MS2 and not C-1 raised the possibility that these genes might be acting by blocking the proper function of the F pilus rather than targeting an aspect of RNA bacteriophage biology. To begin to decipher whether these fragments were blocking F pilus function, I quantified the efficiency of plating of the non-lytic ssDNA phage, Escherichia virus fd. Like Q β and MS2, fd infects *E. coli* cells using the F pilus, but as an ssDNA phage, it has a completely different lifecycle. I found that fd phage production was completely blocked by the overexpression of any of the four fragments.

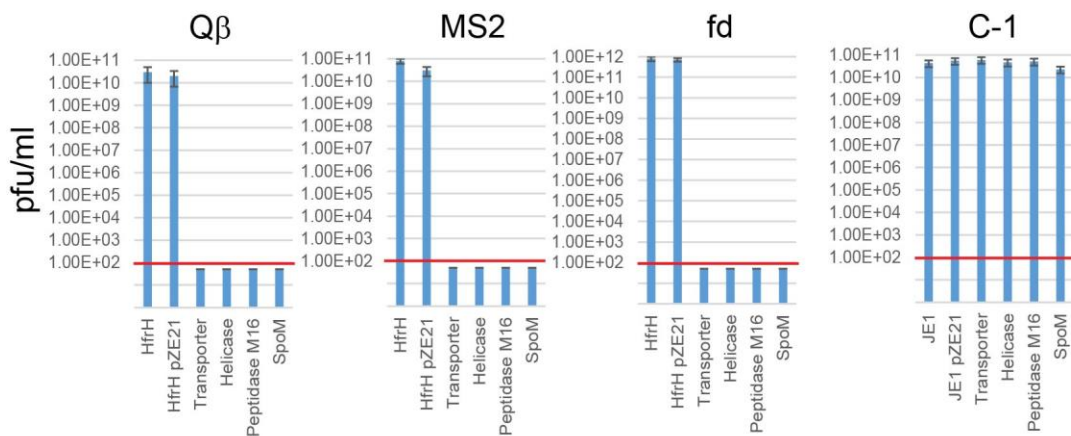


Figure 4.3. Efficiency of plating of Q β , MS2, fd and C-1 with overexpressed metagenomic fragments

Discussion:

Despite the rapid progress in phage resistance mechanisms, an outstanding question in the field is how bacteria resist RNA bacteriophage infection. Here, I attempt to identify the first genes that are capable of conferring resistance to the RNA bacteriophage, Q β . By using a functional metagenomic screen, I identified four putative genes that were able to confer a resistance phenotype to both RNA bacteriophages Q β and MS2 but not C-1. However, these genes also conferred resistance to the ssDNA phage Fd, which raises the question of whether these genes are specifically resisting RNA bacteriophages or just altering pilus function.

At this time, we cannot definitively state that these genes are altering the F pilus and thus inhibiting phage entry or whether these genes are acting in a direct antiviral fashion. One could argue that because these fragments are effective against only the F specific phages (Q β , MS2 and fd) and not C-1 that the most obvious explanation is that the F pilus is somehow altered. This assertion relies on the assumption that it is unlikely that the Q β /MS2 are sensitive to the same resistance mechanisms as fd. On the other hand, one could argue that the lack of resistance in C-1 does not necessarily implicate the F pilus, since a different *E. coli* strain (JE1) is used to test C-1. Instead of a receptor, one could argue that the gene carriage of HfrH and JE1 could be fundamentally different, and that these metagenomic fragments might be interacting with genes that are only present in HfrH and not JE1, and thus only effecting their resistance phenotype in HfrH. One could even argue that C-1 phage might have evolved antagonistic proteins that inhibit these resistance genes, and that it is unlikely that any one gene will resist all RNA bacteriophages. The necessary experiment to properly dissect whether these genes are in fact blocking a step in the viral lifecycle post-entry would be to electroporate the genomes of Q β and MS2 into HfrH and assess whether overexpression of any of these four fragments inhibits virion production¹². Because these viruses are all (+)ssRNA viruses, their genomic RNA is naturally infectious and electroporating their genomes into these cells will allow us to test directly how these genes affect translation, replication, assembly and release of these viruses. If Q β and MS2 can form the same number of viruses in the control cells and the overexpressed cells, then it would suggest that these genes are blocking entry.

Small improvements could be made to the functional metagenomic screen design in the future to reduce the possibility that we would identify genes that alter pilus function. One very direct improvement that could be made would be to change the host *E. coli* that is used in these experiments. Rather than using an *E. coli* strain that only expresses one receptor on its cell surface, we could construct an *E. coli* strain that both has an F pilus and another compatible pilus that mediates infection of C-1 phage. The

functional metagenomic screen would then be performed using both Q β and C-1, thus forcing only metagenomic fragments that could resist both phages to be selected.

Materials and Methods:

Strains: HfrH dhuA was a gift from Ryland Young and served as hosts for the functional metagenomic screen, infection curves (for Q β and MS2), and lawns for bacteriophage plating (for Q β , MS2 and fd). JE1 served as hosts for the C-1 phage infection curves and lawns for C-1 bacteriophage plating. *E. coli* C3000 was used for phage propagation of Q β , MS2 and fd. *E. coli* strains were grown under aerobic conditions at 37 uC in standard Luria–Bertani (LB) medium. For infections, this medium was supplemented with 10 mM CaCl₂. Q β , MS2, and fd were all acquired from the American Type Culture Collection and phage C-1 was acquired from the Félix d'Hérelle Reference Center for bacterial viruses of the Université Laval.

Functional metagenomic screen: A plasmid library of metagenomic fragments was electroporated into HfrH dhuA. These cells were incubated in SOC media for 1 hour to recover and then transferred to 10 mL of LB supplemented with 10 mM CaCl₂. These cultures are then either infected with Q β at an MOI = 10 or left untreated. After 24 hours, the plasmids from these cultures were extracted using a Qiagen Miniprep kit. As the susceptible host (HfrH dhuA K-12 *E. coli*) is spontaneously resistant to Q β infection at a rate of 1:10⁴, I performed 3 serial selections on the population of metagenomic plasmids to ensure any resulting genes identified were in fact conferring phage resistance. The metagenomic inserts were then amplified using conserved primers to the vector backbone. These amplified regions were then constructed into libraries using the NEBNext protocol and sequenced on an Illumina MiSeq 250. Sequencing data was assembled using IDBA and reads were mapped to contigs using Bowtie. RPKM values were calculated using samtools and custom scripts.

Infection Growth Curve: Overnight cultures were back diluted, grown to mid-log phase and then back diluted to an OD₆₀₀ = 0.1. 100 uL of backdiluted culture was then added to a 96 well plate. Viruses were diluted All infectious were performed at an initial MOI = 0.1.

Efficiency of Plating Assay: The double overlay plaque assay was used as previously described¹³.

Briefly, overnight cultures were back diluted grown to mid-log phase and then added to 10 mL of a molten soft agar overlay. 10 uL of a phage suspension serially diluted ranging from 10^{10} pfu/ml to 10^2 pfu/ml was then added to the soft agar and bacterial suspension, and then plated onto hard agar. Plates were incubated aerobically overnight at 37 C and plaques were counted manually the next day. Soft agar was made up of LB + 10 mM CaCl₂ and 0.4% agar. Hard agar was made up of LB + 10 mM CaCl₂ and 1% agar.

References

- 1 tenOever, Benjamin R. The Evolution of Antiviral Defense Systems. *Cell Host & Microbe* **19**, 142-149, doi:10.1016/j.chom.2016.01.006 (2016).
- 2 Dy, R. L., Richter, C., Salmond, G. P. C. C. & Fineran, P. C. Remarkable Mechanisms in Microbes to Resist Phage Infections. *Annual Review of Virology* **1**, 307-331, doi:10.1146/annurev-virology-031413-085500 (2014).
- 3 Zinder, N. *RNA Phages*. (Cold Spring Harbor Laboratory, 1975).
- 4 van Duin, J. & Olsthoorn, R. C. L. 1035-1043 (2012).
- 5 Klovins, J., Overbeek, G. P., van den Worm, S. H. E., Ackermann, H. W. & van Duin, J. Nucleotide sequence of a ssRNA phage from Acinetobacter: Kinship to coliphages. *Journal of General Virology* **83**, 1523-1533 (2002).
- 6 Loeb, T. Isolation of a bacteriophage specific for the F+ and Hfr mating types of Escherichia coli K-12. *Science* **131**, 932-933 (1960).
- 7 Schmidt, J. M. Observations on the adsorption of Caulobacter bacteriophages containing ribonucleic acid. *Journal of general microbiology* **45**, 347-353, doi:10.1099/00221287-45-2-347 (1966).
- 8 Bernhardt, T. G., Wang, I. N., Struck, D. K. & Young, R. A protein antibiotic in the phage Qbeta virion: diversity in lysis targets. *Science (New York, N.Y.)* **292**, 2326-2329, doi:10.1126/science.1058289 (2001).
- 9 Kashiwagi, A. & Yomo, T. Ongoing phenotypic and genomic changes in experimental coevolution of RNA bacteriophage Q β and Escherichia coli. *PLoS genetics* **7**, e1002188-e1002188, doi:10.1371/journal.pgen.1002188 (2011).
- 10 Hosseinidoust, Z., van de Ven, T. G. M. & Tufenkji, N. Evolution of pseudomonas aeruginosa virulence as a result of phage predation. *Applied and Environmental Microbiology* **79**, 6110-6116, doi:10.1128/AEM.01421-13 (2013).
- 11 Sirgel, F. a., Coetzee, J. N., Hedges, R. W. & Lecatsas, G. Phage C-1: an IncC group; plasmid-specific phage. *Journal of general microbiology* **122**, 155-160, doi:10.1099/00221287-122-1-155 (1981).
- 12 Taketo, A. RNA transfection of. **1007**, 127-129 (1989).
- 13 H.Adams, M. Abortive Infection with Phage T2 at Low Temperatures. *Virology* **1**, 336-346 (1955).

5. Picobirnaviruses are a possible novel family of RNA bacteriophages

Introduction

One of the major limitations of the massive expansion of RNA bacteriophages described previously is that it relied on alignment^{1,2}. This reliance on alignment means that all the novel RNA bacteriophages are somehow related to a known, previously cultured, RNA bacteriophage. This reliance is problematic because as mentioned before, only two viral families of RNA phages have been identified, the *Leviviridae* and *Cystoviridae*. The paucity of known RNA viral families of bacteria is somewhat strange, as this trend is not mirrored among the eukaryotic RNA viruses, in which there are over 30 families of RNA viruses. Therefore, I wanted to see if I could identify a novel family of RNA bacteriophages that were unrelated to the previous two families of RNA bacteriophages. There are some ecological and genomic clues we could look for to identify this family. Namely:

1. Viruses in this putative family would be present in ecological niches that contain or are adjacent to bacteria
2. Viruses in this putative family would be identified in sequencing studies that analyzed RNA and not in those that sequence DNA
3. Viruses in this putative family would ideally contain genomic signatures consistent with bacterial infection
4. Viruses in this putative family would ideally contain viral genes consistent with an RNA virus (an RNA dependent RNA polymerase, etc.)

Through analysis of our previously sequenced data, I identified that a commonly identified viral family, the *Picobirnaviridae*, fulfilled these criteria.

Picobirnaviruses are a family of bisegmented double stranded RNA viruses that are highly prevalent in mammalian stool samples³⁻⁵. Picobirnaviruses are thought to encode three genes: and RNA-dependent RNA polymerase gene encoded on Segment 2, a capsid gene encoded on Segment 1 and an ORF of unknown function also encoded on Segment 1 (Figure 5.1)^{6,7}. Despite their high prevalence in

stool samples of a variety of animals, they have yet to be associated consistently with any disease⁸⁻¹².

Currently, it is primarily thought that picobirnaviruses infect mammalian cells; however, this idea is only based on the fact that this virus is primarily found in mammalian stool. No group has cultured this virus in any mammalian cell line. As picobirnaviruses are most closely related to the unicellular eukaryote infecting partitiviruses, some labs have hypothesized that these viruses might infect the unicellular eukaryote cryptosporidium⁶.

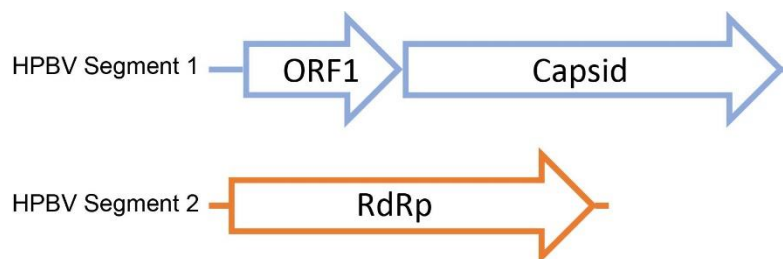


Figure 5.1. Genome organization of Human Picobirnavirus

Here, we present comparative genomic evidence that picobirnaviruses might be an unrecognized family of RNA bacteriophages. By mining previously sequenced data, I was able to identify 41 novel picobirnavirus sequences. These sequences were highly divergent from each other and in general shared no nucleotide similarity. Through comparative analysis of among the novel and known picobirnavirus genomes, we found that almost all picobirnaviral genomes contained bacterial ribosomal binding site (RBS) sequences upstream of each open reading frame. This prevalence of RBS sequences suggests that picobirnaviruses infect bacteria rather than animals. We aimed to establish whether Human Picobirnavirus (HPBV) can replicate and package in bacteria.

Results

Identification of multiple new sequences related to picobirnaviruses

Comparative genomics is strongest when the analysis contains a large number of sequences from highly diverse organisms in the same taxon of interest. Therefore, I wanted to maximize the number of

picobirnavirus sequences I had to analyze. To do this, I mined local datasets for novel picobirnaviruses as previously described for RNA bacteriophages². From this effort, I was able to assemble 41 novel contigs that contained ORFs that aligned to known picobirnaviruses; with 21 contigs containing ORFs that aligned to the RNA dependent RNA polymerase on Segment 2 and the other 20 contigs containing ORFs that aligned to proteins encoded on Segment 1. None of these contigs aligned to any other contig with greater than 75% nucleotide identity across the whole contig, or to any known picobirnavirus genome.

Enrichment of bacterial RBS in picobirnaviruses

Unlike eukaryotic mRNA, bacterial mRNA contains defined nucleotide sequences upstream of each ORF that allows the ribosome to bind and initiate translation¹³⁻¹⁵. In most bacterial this sequence is some 4-mer or greater of the sequence AGGAGG. RNA bacteriophages also encode and conserve these RBS sequences, with the first RBS sequence even being defined in the RNA bacteriophage MS2¹⁵. Therefore, the presence of a conserved RBS sequence would be suggestive that a family of RNA viruses were in fact bacteriophages. We analyzed the frequency of RBS sequences in all known and novel picobirnaviruses. Excepting ORF1 of Turkey Picobirnavirus, every ORF contained a 5-mer RBS sequence 5' to the predicted methionine start codon (Figure 5.2). This conservation is not an artifact of nucleotide sequence similarity, as the surrounding regions of the RBS sequence are not conserved. We then wanted to see if this enrichment for ribosomal binding sequences was specific to picobirnaviruses or a feature of all eukaryotic RNA and DNA viruses. Therefore, we assessed the prevalence of RBS sequences in known eukaryotic viruses and found that only 117 out of 2585 UTR sequences contained an RBS 5-mer sequence. Under optimal conditions the probability of at least one RBS 5-mer occurring by chance in a random 20 nucleotide sequence is 0.031, which means for 2585 independent sequences, random association would indicate that 80 sequences would have a 5-mer RBS sequence, with an estimated variance of 110. From a viral genomic perspective, no eukaryotic viral genome had more than 50% of their ORFs preceded by 5-mer RBS sequences (Figure 5.3). We additionally wanted to compare

the prevalence of RBS sequences in picobirnaviruses to the prevalence in bona fide bacteriophages. Therefore, we assessed the prevalence of RBS sequences in known bacteriophages and found that predictably, a much higher percentage of bacteriophage ORFs are preceded by RBS sequences. We additionally analyzed eukaryotic virus and bacteriophage genomes for the frequency of 4-mer and 6-mer RBS sequences, and consistently found that prevalence of RBS sequences is an identifying factor for bacteriophage genomes, relative to eukaryotic viruses. Overall, the fact that picobirnaviruses tend to have bacterial RBS sequences suggests that they are more genomically similar to bacteriophage genomes rather than eukaryotic RNA viruses.

RNA-dependent RNA Polymerase

Species	5' UTR
Human Picobirnavirus 0	AGGAGGT-TT-A-CT--ATG
Human Picobirnavirus 1	AGGAGGT-TT-A-CT--ATG
Human Picobirnavirus 2	AGGAGG--CTTCATT--ATG
Human Picobirnavirus 3	AGGAGG--ACTACTT--ATG
Human Picobirnavirus 4	AGGAGG--ACTACTT--ATG
Human Picobirnavirus 5	AGGAGGT-CATTGAC--ATG
Human Picobirnavirus 6	AGGAGGT-TACGATT--ATG
Human Picobirnavirus 7	AGGAGGT-TATTCTT--ATG
Human Picobirnavirus 8	AGGAGG--CTTCTA--ATG
Monkey Picobirnavirus 0	AGGAGGT-TAGTCT--ATG
Monkey Picobirnavirus 1	AGGAGGT-TAGTCT--ATG
Equine Picobirnavirus 0	AGGAGGT-TAGG-TT--ATG
Equine Picobirnavirus 1	AGGAGGT-TAAG-CT--ATG
Fox Picobirnavirus	AGGAGG--CTATCAC--ATG
Bovine Picobirnavirus	AGGAGGA-CTACAA--ATG
Otarine Picobirnavirus	AGGAGG--CCTATCAC-ATG
Turkey Picobirnavirus	AGGAGGT-CATTGATG
Novel Picobirnavirus	AGGAGGT-TTCTT--ATG
Novel Picobirnavirus	AGGAGGT-GCTACTCTAG
Novel Picobirnavirus	-GGAGG--AGTAAACCATG
Novel Picobirnavirus	AGGAGGT-TTACT--ATG
Novel Picobirnavirus	AGGAGGT-TATT--ATG
Novel Picobirnavirus	AGGAGG--CACAATA--ATG
Novel Picobirnavirus	AGGAGG--AGAAA--ATG

Known Picobirnaviruses Novel Picobirnaviruses

Capsid Species

Species	5' UTR
Human Picobirnavirus 0	AGGAGGT-AATA-AAT--ATG
Human Picobirnavirus 1	AGGAGGT-T--T-ATC--ATG
Human Picobirnavirus 2	AGGAGGT-T--C-AAA--ATG
Equine Picobirnavirus 0	AGGAGG--ATTG--ATG
Equine Picobirnavirus 1	AGGAGGT-ATTGATT--ATG
Porcine Picobirnavirus 0	-GGAGG-CT--AAT--ATG
Porcine Picobirnavirus 1	AGGAGGT-A-TA-ATT--ATG
Porcine Picobirnavirus 2	AGGAGGT-A-TA-ATT--ATG
Turkey Picobirnavirus	-GGAGG--AATTATCG--ATG
Fox Picobirnavirus	AGGAG--CCT-A-ATT--ATG
Rabbit Picobirnavirus	AGGAGGT-A--A-AT--ATG
Novel Picobirnavirus	AGGAGGT-TCAT--ATG
Novel Picobirnavirus	AGGAGGG-CATACC--ATG
Novel Picobirnavirus	AGGAGGT-AAATATA--ATG
Novel Picobirnavirus	AGGAG--AATTATTAT--ATG
Novel Picobirnavirus	AGGAGGT-CCATTACGC--ATG
Novel Picobirnavirus	AGGAGGT-CTATA--ATG
Novel Picobirnavirus	AGGAGGT-AGTATA--ATG
Novel Picobirnavirus	AGGAGGG-TATACC--ATG
Novel Picobirnavirus	AGGAG--AGTCTAGT--ATG
Novel Picobirnavirus	AGGAG--AAAVPAAT--ATG
Novel Picobirnavirus	AGGAGGT-TACT--ATG
Novel Picobirnavirus	AGGAGGT-AGACAA--ATG
Novel Picobirnavirus	AGGAGGT-ACTGTT--ATG
Novel Picobirnavirus	AGGAGG--ACTTACA--ATG
Novel Picobirnavirus	AGGAG--TGCTTAT--ATG
Novel Picobirnavirus	AGGAGGT-CAGTCCT--ATG
Novel Picobirnavirus	AGGAGGT-ATAGTAAT--ATG
Novel Picobirnavirus	AGGAGGT-TAAAC--ATG

ORF1

Species	5' UTR
Human Picobirnavirus 1	AGGAGGT---TATTTA---ATG
Human Picobirnavirus 2	AGGAGGT-GGTAATC---ATG
Equine Picobirnavirus 1	AGGAGG--AACCTAAATA--ATG
Equine Picobirnavirus 2	AGGAGG---AAMG---ATG
Turkey Picobirnavirus	AGGAAGT-GACAAC--ATG
Porcine Picobirnavirus 1	AGGAGGT-GAAAGTT---ATG
Porcine Picobirnavirus 2	AGGAGGT---ATATT---ATG
Porcine Picobirnavirus 3	AGGAGGT---ATATT---ATG
Fox Picobirnavirus	AGGAGGT---ATTCTA--ATG
Rabbit Picobirnavirus	AGGAGGT-GTCAATGT---ATG
Novel Picobirnavirus	AGGAGGT-TGCT--ATG
Novel Picobirnavirus	AGGAGG--AATCATTT--ATG
Novel Picobirnavirus	AGG--GT-GTACAGAT--ATG
Novel Picobirnavirus	AGGAGAT-GTCTTATT--ATG
Novel Picobirnavirus	AGGAGG--AAATCTAAGG-ATG
Novel Picobirnavirus	AGGAGGT-CTT-----ATG
Novel Picobirnavirus	AGGAGGT-AAGAAC-----ATG
Novel Picobirnavirus	AGGAGG--ATGCCTA---TTG
Novel Picobirnavirus	-GGAGG--ATCAGTC---ATG
Novel Picobirnavirus	AGGAGG--AAACTCACAC-ATG
Novel Picobirnavirus	AGGAGG--AGAT-----ATG
Novel Picobirnavirus	AGGAGG-AACTCAC-----ATG

Figure 5.2. Alignment of RBS sequences among known and novel picobirnaviruses

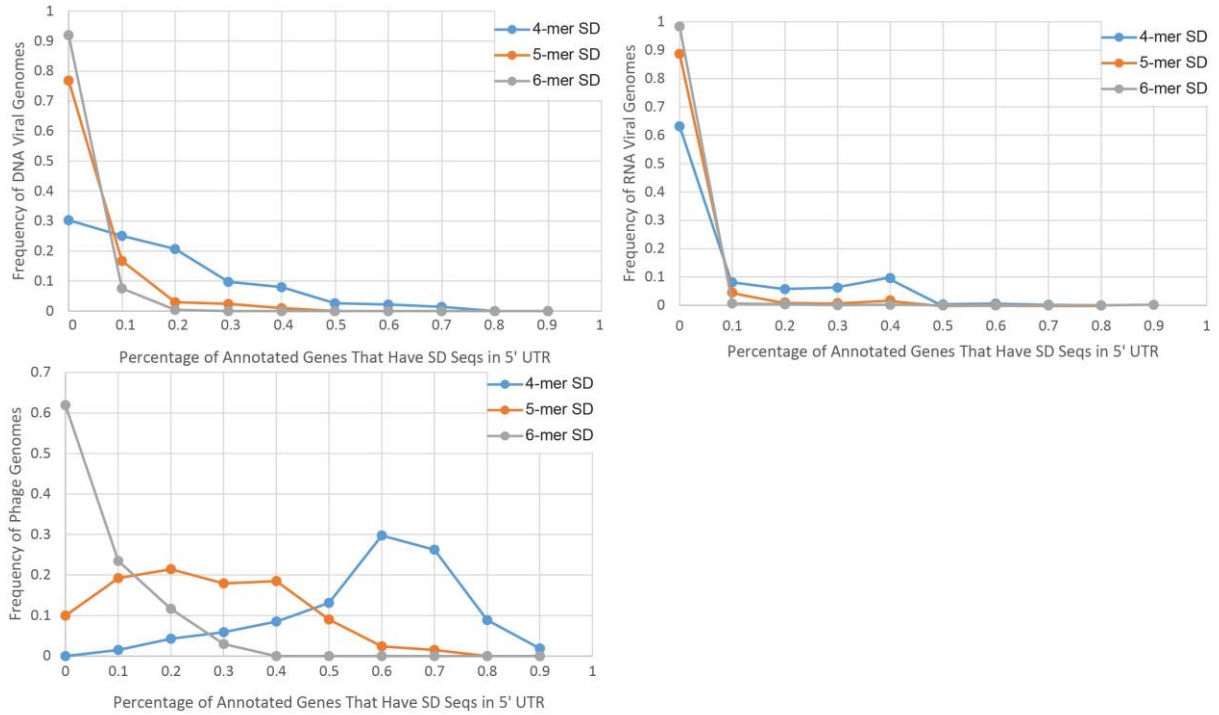


Figure 5.3. RBS sequence enrichment among eukaryotic DNA and RNA viral sequences and bacteriophages

Construction of a HPBV reverse genetic system

We then wanted to assess whether we could demonstrate picobirnaviruses could undergo steps within its lifecycle in a bacterial cell. To do this, we constructed a reverse genetic system for the prototype picobirnavirus, Human Picobirnavirus (HPBV). The reverse genetic system consisted of two plasmids that each contained a viral segment under the control of the T7 promoter and with the 3' end under the control of the hepatitis D ribozyme and T7 terminator (Figure 5.4). We transformed these plasmids into the *E. coli* strain BL-21(DE3), as this strain expresses the T7 RNA polymerase under the lac promoter. To assess packaging, we induced BL-21(DE3) cells transformed with either HPBV Segment 1, HPBV Segment 2, or both HPBV Segment 1 and 2 and then attempted to visualize viral like particles by transmission electron microscopy (TEM) after inducing these cells with IPTG. We visualized no VLPs (Figure 5.5).

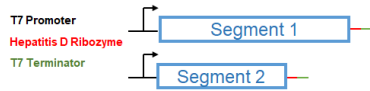


Figure 5.4. Schematic of initial HPBV reverse genetics system

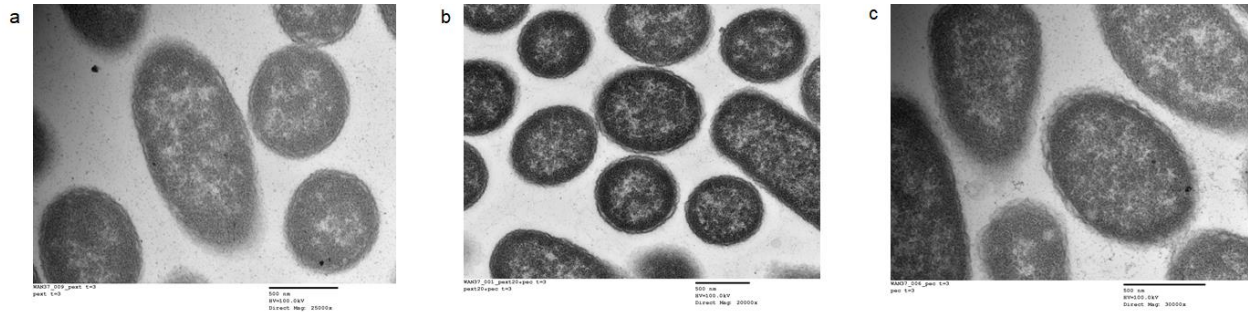


Figure 5.5. Transmission electron microscopy of the overexpressed picobirnaviral segments. a) Segment 1 b) Segment 2 c) Segment 1 and Segment 2

Enhanced HPBV genomic replication cannot be detected in *E. coli* cells

To assess whether HPBV could replicate its genome, we measured HPBV RNA levels in bacterial cells by qRT-PCR. To do this, we wanted to perform a form of pulse-chase experiment, in which we induce bacterial cells to express the HPBV genome, block host cell transcription and then assess whether HPBV RNA levels continue to increase. As the wildtype genomic RNA levels are contributed to both by the transcription of RNA from the plasmid, the stability of the RNA in the cell, as well as RNA replication by the virus, we included a mutant HPBV Segment 2 that contains two mutations in the RdRp at the catalytic GDD residues converting them to GNN. This mutant RdRp will be unable to replicate RNA and any RNA detected in this mutant will be completely from plasmid transcription. Additionally, we needed to move the reverse genetic constructs into the low copy plasmid, pMLBAD, as the RNA extracted from cells containing the high copy plasmids was also routinely contaminated with plasmid DNA, confounding any measurement of RNA from these cells. This construct now contains both segments on the same plasmid in tandem, maintaining the T7 promoters, HDV ribozyme and T7 Terminator control structures (Fig 6). Finally, to reduce the amount of de novo transcription occurring

from the plasmids, we treated the cells with the antibiotic rifampicin, which inhibits the host RNA polymerase. Therefore, HPBV Segment 2 RNA levels should be primarily determined by the RNA dependent RNA polymerase. We transformed both wildtype and GNN mutant constructs into BL-21(DE3) cells and induced the cells with IPTG to initiate transcription for 15 minutes, washed the cells twice with LB and treated the cells with rifampicin. We did not observe consistently higher levels of RNA in the wildtype cells over the mutant virus.

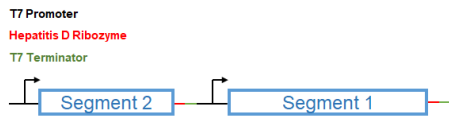


Figure 5.6. Schematic of low copy HPBV reverse genetics system

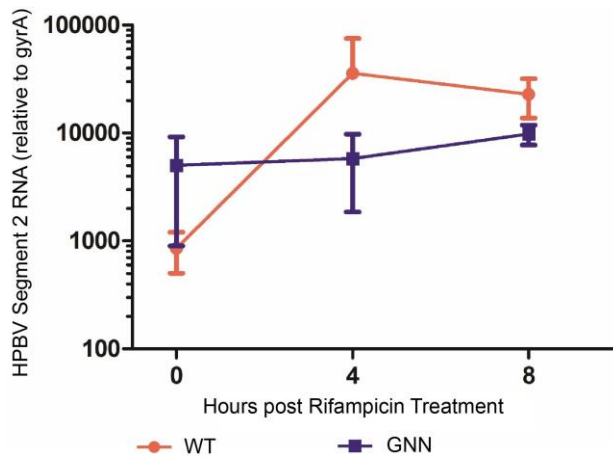


Figure 5.7. HPBV2 WT Segment 2 does not decrease slower than the catalytically dead mutant

Construction of a HPBV replication reporter system

Because we could not assess replication directly by measuring transcript, we wanted to test whether we could indirectly prove that HPBV was replicating by constructing a replicon system. What this would involve is constructing a carrier state bacterium, in which the viral RNA replicates as a stable episome in the host bacterium while expressing reporter genes such as chloramphenicol resistance¹⁶. To do this, we constructed new constructs of the HPBV viral segments, placing chloramphenicol acetyl-

transferase (CAT) into the HPBV genome in place of either the RNA-dependent RNA polymerase on Segment 2 or ORF1 on Segment 1 (Fig 8). Expression of both of these constructs stably in *E. coli* BL-21(DE3) cells yielded chloramphenicol resistant colonies, suggesting that expression of these RNA segments is sufficient to make cells chloramphenicol resistant. To construct the carrier state, we put these constructs on a pi-dependent plasmid, which can transcribe RNA in *E. coli* but will not replicate in cells that lack the Pi replication factor (including BL-21(DE3) cells). This system allows us to temporarily express the modified genome fragments and have the plasmid lost. This way, any maintenance of the modified genomic RNA and chloramphenicol resistance must be maintained by viral replication. Transformation of these segments in combination with the HPBV Segment 2 wildtype yielded no chloramphenicol resistant colonies.

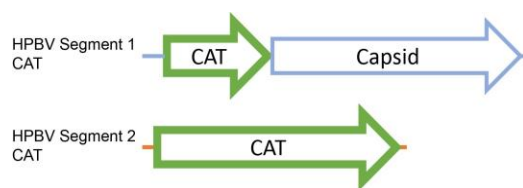


Figure 5.8. Schematic of HPBV constructs containing chloramphenicol resistance genes

Discussion

It is possible that there are additional RNA bacteriophage families that have yet to be discovered. The viral family of *Picobirnaviridae* could be one of those families. Here, we use a comparative genomic approach to show that picobirnavirus genomes are enriched for a bacterial specific signature, specifically, the RBS sequence. We show that this enrichment is specifically found in picobirnaviruses and not generally in eukaryotic RNA viruses and that this sequence is also enriched in bacteriophage genomes. We then unsuccessfully try to demonstrate that a prototypical picobirnavirus, HPBV, can replicate in bacterial cells.

The inability to show that HPBV can replicate in *E. coli* is not evidence that picobirnaviruses are eukaryotic viruses, as there are numerous reasons why we might not detect any sign of HPBV replication. One such assumption that this line of experimentation relies on is that all the host factors required for HPBV replication are conserved and present in *E. coli*. There is supporting literature that this conservation might be true for the other families of RNA phages, in which only a compatible receptor determines susceptibility of a bacteria to a phage^{16,17}. However, these experiments have largely only been done within one taxon: the γ -proteobacteria. It is unknown whether the genes of more distantly related bacteria are conserved sufficiently to support viral replication.

The ultimate evidence to demonstrate that picobirnaviruses are in fact RNA phages would be to identify a bacterium that could propagate any individual picobirnavirus. Identifying such a host is methodologically challenging for a variety of reasons. A majority of the bacteria in the gut are not culturable, which by extension also means their phages are also not culturable. If picobirnaviruses infect one of these non culturable bacteria, then even a systematic screen of all culturable gut bacteria will not identify the host of a picobirnavirus. As a way to narrow down bacterial strains to screen, it is tempting to suggest that 16S rRNA data can be mined to identify bacterial operational taxonomic units (OTUs) that are correlated with picobirnavirus presence. However, this reasoning relies on the assumption that bacteriophages in the stool are sampled from the same space as their bacterial hosts, namely the colon. It is possible that even though the majority bacterial species in stool are sampled from the colon, bacteriophages in stool might be more evenly sampled from all parts of the GI tract. Therefore, the host of picobirnavirus might not even be present in a microbiome sequencing dataset.

There is, however, precedent for systematically identifying hosts of bacteriophages from complex microbial communities. One group constructed a limiting dilution system with microfluidics and used digital PCR to screen, in a high throughput fashion, individual bacterial cells for the presence of a specific DNA phage¹⁸. By isolating single cells and fluorescently amplifying both the 16S rRNA gene and their

viral marker gene of interest, they can rapidly identify wells that have both a bacteria and their virus of interest, and sequence the 16S rRNA amplicon to identify which bacterium was in that well. Although this was done using a DNA phage as a viral target, one could probably re-engineer this system to work with RNA phages.

Materials and Methods

Identification of Novel Picobirnaviral Sequences: Novel picobirnavirus sequences were identified as previously described for other RNA bacteriophages, except the query sequences were the amino acid sequences of all known picobirnaviruses. The sequences used were ORFs derived from the following accessions: KR902502.1, KR902506.1, KF861768.1, KJ495689.1, AB186897.1, KF861772.1, JQ776552.1, AB828072.1, KJ495690.1, AB517734.1, AF246940.1, KF823811.1, KM573790.1, KM573787.1, KM573780.1, KM573789.1, KC692366.1, KJ663814.1, AB517736.1, AB517732.1, KM573800.1, GU968924.1, KM573801.1, KM573802.1, KM573795.1, AB517733.1, AB517735.1, AB517737.1, KM573794.1, KM573799.1, KM573781.1, AB517739.1, KM573785.1, AB517738.1, AF246941.1, KM573782.1, KF823810.1, KM573779.1, KM573798.1, KM573791.1, KM573808.1, KM573786.1, KJ206569.1, KM573804.1, HM070240.1, KM573807.1, NC_007026.1, NC_007027.1

Analysis of RBS Presence in Picobirnaviruses: The proximal 20 nucleotides of the 5'UTR relative to the start codon of each ORF (RdRp, Capsid, ORF1) was isolated from a manually curated list of picobirnaviral sequences. Using custom scripts I analyzed the sequences for the presence of RBS 4-mers (AGGA|GGAG|GAGG), 5-mers (AGGAG|GGAGG) or 6-mers (AGGAGG).

Analysis of RBS Presence in Phages and Eukaryotic RNA Viruses: Genbank files were retrieved from all deposited viruses within established eukaryotic RNA viral families and established bacteriophage taxa. The proximal 20 nucleotides of the 5'UTR relative to the annotated start codon of each ORF was retrieved and analyzed for the presence of RBS 4-mers (AGGA|GGAG|GAGG), 5-mers (AGGAG|GGAGG) or 6-mers (AGGAGG).

HPBV reverse genetic system: Both genomic segments of HPBV were ordered from IDT as gBlocks, with T7 promoter directly 5' to the genome segments, and the HDV ribozyme and T7 terminator directly 3'. HPBV Segment 1 was cloned into the high-copy plasmid pEXT20 (ampicillin resistant) and HPBV Segment 2 was cloned into the medium-copy plasmid pEC (kanamycin resistant). Expression of these plasmids was performed in BL-21(DE3) cells. For the low copy reverse genetic system, HPBV segment 2 and segment 1 were cloned between the KpnI and HindIII in the pMLBAD vector. The chloramphenicol acetyl transferase gene (CAT) was cloned into the pEXT-HPBV-Segment2 and pEC-HPBV-Segment1.

HPBV VLP visualization: BL-21(DE3) cells were transformed with their respective plasmid set and grown overnight in LB with appropriate antibiotics. These cultures were then back-diluted to an OD₆₀₀ = 0.1 and grown to mid-log phase, at which point they were induced with 0.1 mM of IPTG for 2 hours. Cells were then pelleted and negatively stained with uranyl acetate and visualized on using a transmission electron microscope.

HPBV Segment 2 replication assays: BL-21(DE3) cells were transformed with their respective plasmid set and grown overnight in LB with appropriate antibiotics. These cultures were then back-diluted to an OD₆₀₀ = 0.1 and grown to mid-log phase, at which point they were induced with 0.1 mM of IPTG for 15 minutes, washed the cells twice with LB and treated the cells with 0.1 mg/ml rifampicin. Intracellular RNA was isolated using Trizol-Chloroform and measured HPBV segment 2 was measured using qRT-PCR and normalized to the housekeeping gene *gyrA*. HPBV2 primers were as follows, Forward: TAGCATGGAAGCTGTTGATAGG, Reverse: CACTCTGGCACGTTGGATTA, Probe: /56-FAM/ACAGACTTC/ZEN/TCCAAGTTCGACCAGC/3IABkFQ/. *gyrA* primers were as follows, Forward: CAG GAT ATG GTC GTG GGT ATT C, Reverse: CTC TCA CCA GGG TTA CGT TAA G, Probe: /56-FAM/AG ATT TAC C/Zen/T TTC CCG CCA CGA CG/3IABkFQ/. qRT-PCR was performed with the Taqman Fast Virus 1-step mastermix.

Chloramphenicol reporter assay: Chloramphenicol resistance was measured by the ability to for cells to grow on LB/agar plates supplemented with 25 $\mu\text{g/mL}$.

References

- 1 Marz, M. *et al.* Challenges in RNA Virus Bioinformatics. *Bioinformatics (Oxford, England)*, 1-7 (2014).
- 2 Krishnamurthy, S. R., Janowski, A. B., Zhao, G., Barouch, D. & Wang, D. Hyperexpansion of RNA Bacteriophage Diversity. *PLOS Biology* **14**, e1002409, doi:10.1371/journal.pbio.1002409 (2016).
- 3 Pereira, H. G., Flewett, T. H., Candeias, J. a. N. & Barth, O. M. A virus with a bisegmented double-stranded RNA genome in rat (*Oryzomys nigripes*) intestines. *Journal of General Virology* **69**, 2749-2754, doi:10.1099/0022-1317-69-11-2749 (1988).
- 4 Ludert, J. E., Hidalgo, M., Gil, F. & Liprandi, F. Identification in porcine faeces of a novel virus with a bisegmented double stranded RNA genome. *Archives of virology* **117**, 97-107 (1991).
- 5 Gallimore, C., Lewis, D. & Brown, D. Detection and characterization of a novel bisegmented double-stranded RNA virus (picobirnavirus) from rabbit faeces. *Archives of Virology* **133**, 63-73, doi:10.1007/BF01309744 (1993).
- 6 Green, J., Gallimore, C. I., Clewley, J. P. & Brown, D. W. G. Genomic characterisation of the large segment of a rabbit picobirnavirus * and comparison with the atypical picobirnavirus of *Cryptosporidium parvum* Brief Report. 2457-2465 (1999).
- 7 Wakuda, M., Pongsuwanna, Y. & Taniguchi, K. Complete nucleotide sequences of two RNA segments of human picobirnavirus. *Journal of Virological Methods* **126**, 165-169, doi:10.1016/j.jviromet.2005.02.010 (2005).
- 8 Day, J. M., Ballard, L. L., Duke, M. V., Scheffler, B. E. & Zsak, L. Metagenomic analysis of the turkey gut RNA virus community. *Virology journal* **7**, 313-313, doi:10.1186/1743-422X-7-313 (2010).
- 9 Phan, T. G. *et al.* The fecal viral flora of wild rodents. *PLoS Pathogens* **7**, doi:10.1371/journal.ppat.1002218 (2011).
- 10 Hamza, I. A., Jurzik, L., berla, K. & Wilhelm, M. Evaluation of pepper mild mottle virus, human picobirnavirus and Torque teno virus as indicators of fecal contamination in river water. *Water Research* **45**, 1358-1368, doi:10.1016/j.watres.2010.10.021 (2011).
- 11 Sa, M. *et al.* Feline fecal virome reveals novel and prevalent enteric viruses. *Veterinary microbiology* **171**, 102-111, doi:10.1016/j.vetmic.2014.04.005 (2014).
- 12 Bodewes, R. *et al.* Viral metagenomic analysis of feces of wild small carnivores. *Virology Journal* **11**, 89-89, doi:10.1186/1743-422X-11-89 (2014).
- 13 Ma, J., Campbell, A. & Karlin, S. Correlations between Shine-Dalgarno sequences and gene features such as predicted expression levels and operon structures. *Journal of Bacteriology* **184**, 5733-5745, doi:10.1128/JB.184.20.5733-5745.2002 (2002).
- 14 Steitz, J. A. Polypeptide chain initiation: nucleotide sequences of the three ribosomal binding sites in bacteriophage R17 RNA. *Nature* **224**, 957-964 (1969).
- 15 Shine, J. & Dalgarno, L. The 3'-terminal sequence of *Escherichia coli* 16S ribosomal RNA: complementarity to nonsense triplets and ribosome binding sites. *Proceedings of the National Academy of Sciences* **71**, 1342-1346 (1974).
- 16 Sun, Y., Qiao, X. & Mindich, L. Construction of carrier state viruses with partial genomes of the segmented dsRNA bacteriophages. *Virology* **319**, 274-279, doi:10.1016/j.virol.2003.10.022 (2004).
- 17 Hoogstraten, D. *et al.* Characterization of phi8, a bacteriophage containing three double-stranded RNA genomic segments and distantly related to Phi6. *Virology* **272**, 218-224, doi:<http://dx.doi.org/10.1006/viro.2000.0374> (2000).
- 18 Erlenkeuser, H. *et al.* Probing Individual Environmental Bacteria for Viruses by Using Microfluidic Digital PCR. *Science (New York, N.Y.)* **333**, 807-812 (2006).

6. Conclusions and Future Directions

With the recognition that communities of highly diverse viruses are associated with mammals, the next step is to understand how these viral communities impact mammals. However, to completely understand the role of the virome, it is critical to be able to identify as many viral sequences as possible. The ability to identify all viruses within the virome remains a major challenge in identifying the role of the virome in health and disease^{1,2}. Although numerous challenges still are present on the experimental side, there are still computational challenges in identifying viruses from deep sequencing data. These challenges include the lack of diversity among the microbial viruses as well as the reliance on amino acid and nucleotide based alignment metrics to identify viruses. Here, I address these computational limitations to massively expand the diversity of microbial viruses, and then use this massive expansion as a justification to pursue broader experimental questions related to microbial virology.

I recognized the under representation of known RNA bacteriophages, and by directly mining previously sequenced data, I was able to identify 122 novel RNA bacteriophages³. Although it is unclear why the RNA bacteriophages were so vastly underrepresented, there might be methodological biases in previous bacteriophage discovery studies. Classically, bacteriophages were discovered through the use of enrichment cultures and plaque assays. When samples are collected to propagate virus, they often undergo numerous steps to purify VLPs before they are used to plaque virus. These steps include enrichment on susceptible hosts, concentration by tangential flow filtration or centrifugation, filtration through 0.2 um filters, and chloroform treatments to reduce bacterial contamination⁴⁻¹⁴. Any of these steps, but particularly the chloroform treatment and culture enrichment, might reduce the ability to culture of RNA bacteriophages. This idea is especially relevant since I know one family of RNA bacteriophages,

the *Cystoviridae*, are enveloped virus, which means that they would be inactivated by chloroform treatment¹⁵. Methods that do not excessively alter environmental samples are likely to enable the culture of novel, diverse viruses. This principle has been demonstrated by the culture of novel, aggregating large dsDNA viruses, which were cultured by directly plating soil, without any processing or removal of contaminating bacteria, into top agar^{16,17}. The expansion of bacteriophage culture systems as well as the expansion of hosts that are being used to propagate bacteriophages will lead to more diverse bacteriophages being cultured, perhaps even viruses from the family *Picobirnaviridae*.

With the expansion of RNA bacteriophages, I attempted to identify genes that could restrict RNA bacteriophage infection. Although I were not able to definitively identify any genes that could directly restrict RNA bacteriophages, my functional metagenomics screen did identify genes that did prevent bacterial cells from being lysed by RNA bacteriophages. While I could theoretically continue to screen metagenomic fragments to find a bona fide RNA bacteriophage restriction gene, I could take more classic approaches to identify these genes. One such approach would be taking large banks of bacterial isolates and identify bacterial isolates that are resistant to RNA bacteriophage infection. Once these bacterial isolates are isolated, I could identify the bacterial genes mediating this resistance by performing transposon mutagenesis.

I then try to move beyond alignment to discover novel viruses by creating an alignment independent algorithm that identifies viral sequences using k-mer frequencies, DiscoVir. I then applied DiscoVir to an authentic metagenomic dataset to identify viral segments from a novel bunya-like virus, which I call Discovirus. Discovirus represents the first segmented negative-stranded RNA virus present in a fungus, which fundamentally expands the virological diversity

recognized within fungi. Although in my study, I used DiscoVir to identify a novel virus within my own dataset, there is no reason why I could not apply DiscoVir to public metagenomic datasets to identify sets of contigs that are likely to originate from viruses. The major issue in this approach, however, is validating that these contigs are in fact from viruses, through more classical systems like culture. This necessity to culture novel viruses with genomes that do not align to known viruses is especially problematic, because the organisms that host of these viruses will not necessarily be clear.

A common challenge that has recurred throughout multiple parts of my dissertation has been the ability to identify a host for a specific novel virus and set up a culture system for that virus. This challenge manifested itself during the identification of Discovirus, during which I needed to culture Discovirus in order to demonstrate that it in fact was a virus. Additionally, during my studies on picobirnaviruses, although I suggested that picobirnaviruses might infect bacteria, it would have been greatly advantageous to actually know which species of bacteria any individual picobirnavirus infected. This knowledge would have allowed me to do more targeted culture experiments to try to propagate picobirnavirus. Going forward, I believe the community will need to develop new experimental tools to more rapidly not only identify novel viruses but also identify the hosts of novel viruses, in a high throughput fashion. This necessity is unique to viruses relative to the other components of the microbiomes, because the role of viruses are generally effected through their hosts. Mammalian viruses directly alter the gene expression of mammalian cells and have the potential to directly cause human disease^{18,19}. Bacterial viruses directly alter the physiology of bacteria and can modulate microbial populations^{20,21}. These efforts to rapidly identify viral hosts are already underway, with studies that use Hi-C to

crosslink extrachromosomal elements to their host chromosomes. By sequencing these crosslinked samples, groups have been able to identify the hosts of plasmids by identifying plasmid sequences that are concatenated to host sequences^{22,23}. As many viruses replicate inside their hosts as plasmids, a direct extension of this method could be used to identify bacteriophage genomes in a high throughput manner. The underlying philosophy of crosslinking viral genomes to host nucleic acid can also likely be translated to RNA viruses, by using a version of RNA cross-linking, ligation and sequencing hybrids (CLASH)²⁴. The knowledge of what a virus infects allows not only the practical advantage of being able to experimentally manipulate the virus, but it can also lead to better hypotheses on its role in the virome.

The ultimate goal of identifying novel viruses is to understand their role biological processes, including ecology and human disease. With this broader appreciation of the diversity of viruses, future studies focused on the interaction between the virome and mammalian host will hopefully take into account the more diverse set of microbial viruses presented here.

References

- 1 Marz, M. *et al.* Challenges in RNA Virus Bioinformatics. *Bioinformatics (Oxford, England)*, 1-7 (2014).
- 2 Krishnamurthy, S. R. & Wang, D. Origins and Challenges of Viral Dark Matter. *Virus Research*, doi:10.1016/j.virusres.2017.02.002 (2017).
- 3 Krishnamurthy, S. R., Janowski, A. B., Zhao, G., Barouch, D. & Wang, D. Hyperexpansion of RNA Bacteriophage Diversity. *PLOS Biology* **14**, e1002409, doi:10.1371/journal.pbio.1002409 (2016).
- 4 Adriaenssens, E. M. *et al.* Environmental drivers of viral community composition in Antarctic soils identified by viromics. *Microbiome* **5**, 83-83, doi:10.1186/s40168-017-0301-7 (2017).
- 5 Ashelford, K. E., Day, M. J. & Fry, J. C. Elevated abundance of bacteriophage infecting bacteria in soil. *Applied and Environmental Microbiology* **69**, 285-289, doi:10.1128/AEM.69.1.285-289.2003 (2003).
- 6 Danovaro, R., Dell'Anno, A., Trucco, A., Serresi, M. & Vanucci, S. Determination of Virus Abundance in Marine Sediments. *Applied and Environmental Microbiology* **67**, 1384-1387, doi:10.1128/AEM.67.3.1384-1387.2001 (2001).
- 7 Dunbar, J., White, S. & Forney, L. Genetic diversity through the looking glass: effect of enrichment bias. *Applied and Environmental Microbiology* **63**, 1326-1331 (1997).
- 8 Institut, W. H. O. & Institut, W. H. O. Distribution, Isolation, Host Specificity, and Diversity of Cyanophages Infecting Marine. *Microbiology* **67**, 3285-3290, doi:10.1128/AEM.67.7.3285 (2001).
- 9 Méndez, J. *et al.* Assessment of drinking water quality using indicator bacteria and bacteriophages. *Journal of Water and Health* **2** (2004).
- 10 Og, G., Af, F., Sygdomme, S., Henrik, P. & Epidemiologisk, A. Two Bacteriophages of *Clostridium difficile*. *Journal of clinical microbiology* **21**, 251-254 (2009).
- 11 Staley, J. T. & Konopka, A. Microorganisms in Aquatic and Terrestrial Habitats. *Annual review of microbiology* **39**, 321-346 (1985).
- 12 Sullivan, M. B., Waterbury, J. B. & Chisholm, S. W. Cyanophages infecting the oceanic cyanobacterium *Prochlorococcus*. *Nature* **424**, 1047-1051, doi:10.1038/nature02147 (2003).
- 13 Williamson, K. E., Wommack, K. E. & Radosevich, M. Sampling Natural Viral Communities from Soil for Culture-Independent Analyses. *Applied and Environmental Microbiology* **69**, 6628-6633, doi:10.1128/AEM.69.11.6628-6633.2003 (2003).
- 14 Wilson, W. H., Joint, I. A. N. R., Carr, N. G. & Mann, N. H. Isolation and Molecular Characterization of Five Marine Cyanophages Propagated on *Synechococcus* sp. Strain WH7803. **59**, 3736-3743 (1993).
- 15 Semancik, J. S., Vidaver, a. K. & Van Etten, J. L. Characterization of segmented double-helical RNA from bacteriophage phi6. *Journal of molecular biology* **78**, 617-625 (1973).
- 16 Serwer, P., Hayes, S. J., Thomas, J. a. & Hardies, S. C. Propagating the missing bacteriophages: a large bacteriophage in a new class. *Virology journal* **4**, 21, doi:10.1186/1743-422X-4-21 (2007).
- 17 Thomas, J. A. *et al.* Characterization of *Pseudomonas chlororaphis* myovirus 201varphi2-1 via genomic sequencing, mass spectrometry, and electron microscopy. *Virology* **376**, 330-338, doi:10.1016/j.virol.2008.04.004 (2008).
- 18 Rota, P. a. *et al.* Characterization of a novel coronavirus associated with severe acute respiratory syndrome. *Science (New York, N.Y.)* **300**, 1394-1399, doi:10.1126/science.1085952 (2003).
- 19 Pyrc, K., Jebbink, M. F., Berkhout, B. & van der Hoek, L. Genome structure and transcriptional regulation of human coronavirus NL63. *Virology journal* **1**, 7-7, doi:10.1186/1743-422X-1-7 (2004).

- 20 Sullivan, M. B. *et al.* Prevalence and evolution of core photosystem II genes in marine cyanobacterial viruses and their hosts. *PLoS biology* **4**, e234-e234, doi:10.1371/journal.pbio.0040234 (2006).
- 21 Díaz-Muñoz, S. L. & Koskella, B. *Bacteria-Phage interactions in natural environments*. 1 edn, Vol. 89 (Elsevier Inc., 2014).
- 22 Burton, J. N., Liachko, I., Dunham, M. J. & Shendure, J. Species-Level Deconvolution of Metagenome Assemblies with Hi-C-Based Contact Probability Maps. *G3 (Bethesda, Md.)* **4**, 1339-1346, doi:10.1534/g3.114.011825 (2014).
- 23 Beitel, C. W. *et al.* Strain- and plasmid-level deconvolution of a synthetic metagenome by sequencing proximity ligation products. *PeerJ* **2**, e415-e415, doi:10.7717/peerj.415 (2014).
- 24 Liu, T. *et al.* Detecting RNA-RNA interactions in *E. coli* using a modified CLASH method. *BMC Genomics*, 1-11, doi:10.1186/s12864-017-3725-3 (2017).

Appendix I. List of SRA Files Scanned for RNA Bacteriophages

SRR1745638 SRR1745767 SRR1745770 SRR1745771 SRR1745772 SRR1745796
SRR1745797 SRR1745799 SRR1745803 SRR1745804 SRR1745805 SRR1745806
SRR1745807 SRR1745808 SRR1745809 SRR1745810 DRR002188 DRR002189 DRR013890
DRR013891 DRR013892 DRR013893 DRR013894 DRR013895 DRR013896 DRR013897
DRR013898 DRR013899 DRR013900 DRR018326 DRR018327 DRR018328 DRR018329
DRR018330 DRR018331 DRR018332 DRR018333 DRR018334 DRR018335 DRR018336
DRR018337 DRR018338 DRR018339 DRR018340 DRR018341 DRR018342 DRR018343
DRR018344 DRR018345 DRR018346 DRR018347 DRR018348 DRR018349 DRR018350
DRR023219 DRR023253 ERR435880 ERR435899 ERR435900 ERR435901 ERR435902
ERR435903 ERR435904 ERR435905 ERR435906 ERR435907 ERR435908 ERR435909
ERR435910 ERR435911 ERR490210 ERR490212 ERR490214 SRR1045873 SRR1045874
SRR1045894 SRR1300461 SRR1390629 SRR1390630 SRR1390631 SRR1390632
SRR1390633 SRR1390634 SRR1390635 SRR1390636 SRR1390637 SRR1406754
SRR1406755 SRR1406756 SRR1406759 SRR1406760 SRR1406761 SRR1406763
SRR1406764 SRR1406765 SRR1406766 SRR1509456 SRR1509457 SRR1509458
SRR1557865 SRR1557947 SRR1564732 SRR1564733 SRR1564734 SRR1581213
SRR1581214 SRR1653453 SRR1731587 SRR1731588 SRR1731589 SRR1731590
SRR1813043 SRR1814154 SRR2003407 SRR2006120 SRR2039259 SRR1045886
SRR1045887 SRR1045888 SRR1045889 SRR1045890 SRR1045891 SRR1045892
SRR1045893 SRR1045895 SRR1045896 SRR1045897 SRR1045898 SRR1045899
SRR1047417 SRR1106689 SRR1106692 SRR1171050 SRR1171053 SRR1171055
SRR1171057 SRR1171059 SRR1171061 SRR1174700 SRR1174701 SRR1174702
SRR1174703 SRR1174704 SRR1174705 SRR1174706 SRR1174707 SRR1174708
SRR1174709 SRR1174710 SRR1174711 SRR1174712 SRR1174713 SRR1174714
SRR1174715 SRR1174716 SRR1174717 SRR1174718 SRR1174719 SRR1174720
SRR1174721 SRR1174722 SRR1174723 SRR1174724 SRR1174725 SRR1174726
SRR1174727 SRR1174728 SRR1174729 SRR1174730 SRR1174731 SRR1174732
SRR1174733 SRR1174734 SRR1174735 SRR1174736 SRR1174737 SRR1174738
SRR1174739 SRR1174740 SRR1174741 SRR1174742 SRR1174743 SRR1174744
SRR1174745 SRR1174746 SRR1174747 SRR1174748 SRR1174749 SRR1174750
SRR1174751 SRR1174752 SRR1238084 SRR1294384 SRR1294439 SRR1294440
SRR1294458 SRR1294459 SRR1294460 SRR1296793 SRR1296794 SRR1296796
SRR1296864 SRR1296865 SRR1296876 SRR1296905 SRR1296981 SRR1296983
SRR1300296 SRR1300321 SRR1300392 SRR1300395 SRR629687 SRR650486 SRR846900
SRR846901 SRR861263 ERR367970 ERR367971 ERR367972 ERR367973 ERR367974
ERR367975 ERR368433 ERR368434 ERR368435 ERR368436 SRR071372 SRR071373
SRR071374 SRR071375 SRR071377 SRR071378 SRR071379 SRR071380 SRR071381
SRR071382 SRR071383 SRR071384 SRR071385 SRR090361 SRR1011283 SRR1011284
SRR1045872 SRR1045875 SRR1045876 SRR1045877 SRR1045878 SRR1045879
SRR1045880 SRR1045881 SRR1045882 SRR1045883 SRR1045884 SRR1045885
SRR1269732 SRR1269733 SRR1269734 SRR1269735 SRR1269736 SRR1653452
SRR1653454 SRR1924273 SRR1924276 SRR1924277 SRR1924278 SRR1927017

SRR1927018 SRR1943048 SRR1943049 SRR1943053 SRR1943096 SRR1943097
SRR1956776 SRR328548 SRR345608 SRR345609 SRR345610 SRR345611 SRR354204
SRR354205 SRR354206 SRR354207 SRR514120 SRR519096 SRR521273 SRR521274
SRR524807 SRR525179 SRR525236 SRR526901 SRR526903 SRR530843 SRR901892
SRR910337 SRR910339 SRR910356 SRR910358 SRR910359 SRR910386 SRR910388
SRR910391 SRR910413 SRR910415 SRR910416 SRR910418 SRR921559 SRR921662
SRR921663 SRR921670 SRR921671 SRR921672 SRR941770 SRR952241 SRR961044
SRR961045 SRR961046 SRR1237909 SRR1269642 SRR1269646 SRR1269648 SRR1269728
SRR1269729 SRR1269730 SRR1269731 ERR174225 ERR174226 ERR174227 ERR174228
ERR263549 SRR1693417 SRR1694097 SRR1698209 SRR1702288 SRR1704073 SRR1705623
SRR1705786 SRR1707691 SRR1715479 SRR1723005 SRR1735396 SRR1735485
SRR1735504 SRR1735718 SRR1736627 SRR1737223 SRR1737742 SRR1738660
SRR1745840 SRR1752025 SRR1752026 SRR1752027 SRR1752028 SRR1752079
SRR1752116 SRR1752124 SRR1752131 SRR1752133 SRR1781979 SRR1781980
SRR1781981 SRR1781982 SRR1782572 SRR1782573 SRR1782574 SRR1782575
SRR1782576 SRR1782577 SRR1822316 SRR1822317 SRR1824291 SRR1824292
SRR1824293 SRR1824294 SRR1824296 SRR1824297 SRR1824298 SRR1824300
SRR1824301 SRR1824302 SRR1828965 SRR1828976 SRR1828983 SRR1828989
SRR1828991 SRR1828993 SRR1828995 SRR1828998 SRR1829000 SRR1829003
SRR1829005 SRR1829007 SRR1927216 SRR1927217 SRR1927219 SRR1927220
SRR1927222 SRR1927223 SRR1927225 SRR1927229 SRR1927239 SRR2012732
SRR2029830 SRR2029831 SRR2029832 SRR2029836 SRR2029837 SRR2029839
SRR2029846 SRR2029847 SRR2029852 SRR2029853 SRR2029854 SRR2029855 SRR452448
SRR452973 SRR452974 SRR452975 SRR452976 SRR452977 SRR452978 SRR452979
SRR452980 SRR452981 SRR452982 SRR452983 SRR452984 SRR453184 ERR550378
ERR550379 ERR550380 ERR550382 ERR550383 ERR550384 ERR550385 ERR550386
ERR550387 ERR550390 ERR550391 ERR550392 ERR550393 ERR550395 ERR550398
ERR550399 ERR550400 ERR550401 ERR550403 ERR550404 ERR550511 ERR550512
ERR550513 ERR550515 ERR550516 ERR550518 ERR550520 ERR550522 ERR550523
ERR550524 ERR550526 ERR550527 ERR550528 ERR550530 ERR550531 ERR550533
ERR550535 ERR550536 ERR550538 ERR653268 ERR653269 SRR1503359 SRR1509497
SRR1509498 SRR1509518 SRR1509520 SRR1509521 SRR1509522 SRR1557009
SRR1604865 SRR1604866 SRR1606327 SRR1606328 SRR1606329 SRR943121 SRR1210182
SRR1210183 SRR1210184 SRR1210185 SRR1210186 SRR1210187 SRR1210188
SRR1210189 SRR1210190 SRR1210191 SRR1210192 SRR1210193 SRR1210194
SRR1210195 SRR1210196 SRR1210197 SRR1210198 SRR1210199 SRR1210200
SRR1210201 SRR1210202 SRR1210203 SRR1210204 SRR1210205 SRR1210206
SRR1210207 SRR1210208 SRR1210209 SRR1210210 SRR1210211 SRR1210212
SRR1210213 SRR1210214 SRR1210215 SRR1210216 SRR1210217 SRR1210218
SRR1210219 SRR1210220 SRR1210221 SRR1210222 SRR1210223 SRR1210224
SRR1210225 SRR1210226 SRR1210227 SRR1210228 SRR1210229 SRR1210230
SRR1210231 SRR1210232 SRR1210233 SRR1210234 SRR1210235 SRR1210236

SRR1210237 SRR1210238 SRR1210768 SRR1210769 SRR1210820 SRR1210849
SRR1210907 SRR1210935 SRR1210966 SRR1211008 SRR1211009 SRR1211012
SRR1211013 SRR1211014 ERR305910 SRR038714 SRR1002975 SRR1002976 SRR1002977
SRR1002978 SRR1002979 SRR1002980 SRR1002981 SRR1013757 SRR1013758
SRR1038495 SRR1038496 SRR1038497 SRR1137056 SRR1137057 SRR1137058
SRR1210120 SRR1210160 SRR1210161 SRR1210162 SRR1210163 SRR1210164
SRR1210165 SRR1210166 SRR1210167 SRR1210168 SRR1210169 SRR1210170
SRR1210171 SRR1210172 SRR1210173 SRR1210174 SRR1210175 SRR1210176
SRR1210177 SRR1210178 SRR1210179 SRR1210180 SRR1210181 SRR951024 SRR951025
SRR951026 SRR958424 SRR958425 SRR958426 SRR958427 SRR958428 SRR968566
SRR968567 SRR968568 SRR988299 SRR702991 SRR710929 SRR710954 SRR765896
SRR766742 SRR766760 SRR766778 SRR766792 SRR766794 SRR767748 SRR767758
SRR768252 SRR768265 SRR768266 SRR768313 SRR768314 SRR768315 SRR768364
SRR768369 SRR768373 SRR768402 SRR768403 SRR768409 SRR768415 SRR768416
SRR768646 SRR768649 SRR768812 SRR847764 SRR847804 SRR847806 SRR847807
SRR849488 SRR849490 SRR870697 SRR900291 SRR900830 SRR900831 SRR900833
SRR900834 SRR900835 SRR900836 SRR901903 SRR901965 SRR901966 SRR901968
SRR901969 SRR933584 SRR933602 SRR933607 SRR941141 SRR941142 SRR941143
SRR941144 SRR941145 SRR941146 SRR941147 SRR941148 SRR941166 SRR941167
SRR941168 SRR941169 SRR941170 SRR941171 SRR941172 SRR941173 SRR941174
SRR941175 SRR941176 SRR941177 SRR941178 SRR941180 SRR941181 SRR943109
SRR943110 SRR943116 SRR943118 SRR943119 SRR943120 SRR943122 SRR943123
SRR943124 SRR948190 SRR948285 SRR948292 SRR948295 SRR948297 SRR948357
SRR949314 SRR949315 SRR949429 SRR949535 SRR949536 SRR949847 SRR949897
SRR949950 SRR949953 SRR949987 SRR951020 SRR951021 SRR951022 SRR951023
ERR550381 ERR550388 ERR550389 ERR550394 ERR550396 ERR550397 ERR550402
ERR550514 ERR550517 ERR550519 ERR550521 ERR550525 ERR550529 ERR550532
ERR550534 ERR550537 ERR550539 SRR013510 SRR013511 SRR013512 SRR013513
SRR013798 SRR029133 SRR035159 SRR035160 SRR035161 SRR035162 SRR035163
SRR035164 SRR064197 SRR064283 SRR064284 SRR106858 SRR106859 SRR106860
SRR106861 SRR106862 SRR106863 SRR106864 SRR106865 SRR1283299 SRR1283302
SRR1283304 SRR1283306 SRR1283307 SRR1283308 SRR1283309 SRR1283310 SRR192301
SRR1984590 SRR1984763 SRR1985178 SRR400015 SRR413207 SRR443366 SRR443367
SRR443368 SRR443369 SRR443370 SRR448118 SRR524819 SRR524820 SRR524822
SRR524823 SRR524828 SRR531854 SRR531855 SRR531856 SRR531857 SRR531858
SRR531859 SRR531861 SRR571458 SRR594193 SRR594215 SRR594642 SRR594654
SRR594662 SRR594670 SRR616200 SRR616201 SRR618776 SRR618784 SRR618785
SRR618786 SRR618787 SRR618788 SRR618789 SRR618790 SRR618792 SRR618793
SRR618794 SRR618867 SRR618868 SRR618869 SRR618870 SRR618871 SRR618872
SRR618873 SRR618874 SRR618875 SRR618876 SRR618877 SRR618878 SRR618879
SRR618880 SRR618881 SRR765882 SRR768510 SRR768592 ERR313048 ERR313049
ERR313050 ERR313051 ERR313053 ERR313054 ERR313055 ERR313056 ERR313057

ERR313058 ERR313059 ERR313060 ERR313061 ERR313062 ERR313063 ERR313064
ERR313065 ERR313066 ERR313067 ERR313068 ERR313069 ERR313070 ERR313071
ERR313072 ERR313073 ERR313074 ERR313075 ERR313076 ERR313077 ERR313078
ERR313079 ERR313080 ERR313081 ERR313082 ERR313083 ERR313084 ERR313085
ERR313086 ERR313087 ERR313088 ERR313089 ERR313090 ERR313091 ERR313092
ERR313093 ERR313094 ERR313095 ERR313096 ERR313097 ERR313098 ERR313099
ERR313100 ERR313101 ERR313102 ERR313103 ERR313104 ERR843249 ERR843250
ERR843251 ERR843252 ERR843253 ERR843254 SRR1509786 SRR1509787 SRR1509788
SRR1509789 SRR1509791 SRR1509795 SRR1510967 SRR1510968 SRR1510969
SRR1510970 SRR1510971 SRR1510976 SRR1510977 SRR1510978 SRR1510979
SRR1510983 SRR1510984 SRR1510985 SRR1510989 SRR1510990 SRR1510991
SRR1510992 SRR1510993 SRR1510994 SRR1510995 SRR1510996 SRR1510997
SRR1510998 SRR1510999 SRR1511000 SRR1511001 SRR1511002 SRR1511006
SRR1511007 SRR1511008 SRR1511009 SRR1511010 SRR1511011 ERR313046 ERR313047
SRR1918203 SRR449110 SRR488340 SRR488341 SRR488342 SRR488343 SRR488344
SRR516440 SRR526862 SRR526863 SRR526864 SRR526865 SRR526866 SRR526867
SRR526868 SRR526869 SRR526870 SRR526871 SRR526873 SRR526875 SRR526876
SRR526878 SRR526880 SRR526883 SRR526890 SRR526891 SRR526892 SRR526893
SRR526894 SRR526895 SRR618781 SRR618782 SRR618783 SRR926275 SRR926276
SRR926277 SRR926278 SRR926279 SRR926280 SRR1522982 SRR466334 SRR042301
SRR1514791 DRR001793 ERR146953 ERR146954 ERR146955 ERR164435 ERR164436
ERR164438 ERR164439 ERR164440 ERR164441 ERR164442 ERR164443 ERR164444
ERR164446 ERR164448 ERR164450 ERR164452 ERR164454 ERR164455 ERR164456
ERR164457 ERR164458 ERR164459 ERR164460 ERR164461 ERR164462 ERR164463
ERR164464 ERR164465 ERR164466 ERR164467 ERR164468 ERR164469 ERR164470
ERR164471 ERR164472 ERR225968 ERR225969 ERR225970 ERR225971 ERR225972
ERR225973 ERR225974 ERR225975 ERR225976 ERR225977 ERR225978 ERR225979
ERR225980 ERR225981 ERR225982 ERR225983 ERR225984 ERR225985 ERR225986
ERR225987 ERR225988 ERR225989 ERR522217 ERR522218 ERR522219 ERR522220
ERR522221 ERR522222 ERR522223 ERR522224 ERR522225 ERR522226 ERR522227
ERR522228 ERR522229 ERR522230 ERR522231 ERR522232 ERR522233 ERR522234
ERR522235 ERR522248 ERR522249 ERR522250 ERR522251 ERR522252 SRR940544
SRR940545 SRR940546 SRR940547 SRR940548 SRR940549 SRR940550 SRR940551
SRR940552 SRR940553 SRR940554 SRR940555 SRR940556 SRR940557 SRR940558
SRR940559 SRR940560 SRR940561 SRR094690 SRR094691 SRR094692 SRR094693
SRR094694 SRR094695 SRR094696 SRR094697 SRR094698 SRR094699 SRR094700
SRR094701 SRR094702 SRR094703 SRR094704 SRR094705 SRR094706 SRR094707
SRR094708 SRR094709 SRR094710 SRR094711 SRR094712 SRR094713 SRR094714
SRR094715 SRR094716 SRR333528 SRR333529 SRR333530 SRR333531 SRR333532
SRR333533 SRR333534 SRR333535 SRR333536 SRR333537 SRR333538 SRR333539
SRR333540 SRR333541 SRR333542 SRR333543 SRR333544 SRR333545 SRR333546
SRR333547 SRR333548 SRR333549 SRR333550 SRR333551 SRR333552 SRR333553

SRR333554 SRR333555 SRR333556 SRR333557 SRR333558 SRR333559 SRR333560
SRR333561 SRR333562 SRR333563 SRR333564 SRR333565 SRR333566 SRR333567
SRR333568 SRR333569 SRR333570 SRR333571 SRR333572 SRR333573 SRR333574
SRR333575 SRR333576 SRR333577 SRR333578 SRR333579 SRR333580 SRR333581
SRR333582 SRR333583 SRR333584 SRR333585 SRR333586 SRR333587 SRR333588
SRR333589 SRR333590 SRR771435 SRR771436 SRR940536 SRR940537 SRR940538
SRR940539 SRR940540 SRR940541 SRR940542 SRR940543 SRR049005 SRR049013
SRR049014 SRR049017 SRR049023 SRR049042 SRR049056 SRR049100 SRR094681
SRR094682 SRR094683 SRR094684 SRR094685 SRR094686 SRR094687 SRR094688
SRR094689 SRR829034 SRR869111 SRR869112 SRR869114 SRR869117 SRR869119
SRR869120 SRR869133 SRR869134 SRR869136 SRR869137 SRR869138 SRR869141
SRR869143 SRR869146 SRR869151 SRR869153 SRR869156 SRR869157 SRR869159
SRR869161 SRR869162 SRR869166 SRR869167 SRR869168 SRR869171 SRR869172
SRR869176 SRR869177 SRR869179 SRR869181 SRR869182 SRR869183 SRR869184
SRR869186 SRR869187 SRR869188 SRR869191 SRR869192 SRR869193 SRR869196
SRR869197 SRR869198 SRR869201 SRR869202 SRR869203 SRR869204 SRR869206
SRR869207 SRR869208 SRR869211 SRR869212 SRR869213 SRR869216 SRR869217
SRR869220 SRR869228 SRR869252 SRR869256 SRR869262 SRR869266 SRR869270
SRR935337 SRR935339 SRR935340 SRR935341 SRR935342 SRR935348 SRR935349
SRR935350 SRR935351 SRR935352 SRR935354 SRR935356 SRR935357 SRR935358
SRR935359 SRR935360 SRR935361 SRR935363 SRR935364 SRR935366 SRR935367
SRR828660 SRR828661 SRR829033 SRR829867 SRR869106 SRR869107 SRR869110
SRR869115 SRR869116 SRR869139 SRR869142 SRR869144 SRR869147 SRR869148
SRR869149 SRR869152 SRR869154 SRR869158 SRR869163 SRR869164 SRR869169
SRR869173 SRR869174 SRR869178 SRR869189 SRR869194 SRR869199 SRR869209
SRR869214 SRR869219 SRR869223 SRR869224 SRR869227 SRR869231 SRR869233
SRR869234 SRR869237 SRR869238 SRR869241 SRR869242 SRR869245 SRR869247
SRR869248 SRR869251 SRR869255 SRR869259 SRR869261 SRR869265 SRR869269
SRR869273 SRR916903 SRR1202411 SRR1202418 SRR1202422 SRR1202428 SRR1202436
SRR1202438 SRR1202439 SRR1202447 SRR1202449 SRR1202490 SRR1202500
SRR1202501 SRR1202502 SRR1202506 SRR1202517 SRR1202518 SRR1202519
SRR1202524 SRR1202529 SRR1202530 SRR1202531 SRR1202539 SRR1202543
SRR1202549 SRR1202554 SRR1202560 SRR1202561 SRR1202571 SRR1202577
SRR1202579 SRR1202584 SRR1202585 SRR1202590 SRR1202591 SRR1202592
SRR1202602 SRR1202604 SRR1202614 SRR1202620 SRR1202621 SRR1202623
SRR1202630 SRR1202631 SRR1208210 SRR1208225 SRR1208226 SRR1208234
SRR1208244 SRR1208280 SRR1208292 SRR1208293 SRR1208294 SRR1208304
SRR1208316 SRR1208323 SRR1208326 SRR1208360 SRR1208361 SRR1208379
SRR1208386 SRR1208388 SRR1208414 SRR1208437 SRR1208440 SRR1208442
SRR1208443 SRR1208445 SRR1208453 SRR1208454 SRR1208458 SRR1208466
SRR1208469 SRR1208472 SRR1208474 SRR1208480 SRR1208497 SRR1208517
SRR1208518 SRR1208527 SRR1208531 SRR1208541 SRR1208547 SRR1208548

SRR1208549 SRR1208554 SRR1208558 SRR1208566 SRR1208569 SRR1208570
SRR1208571 SRR1208578 SRR1208579 SRR1208582 SRR1208583 SRR1208590
SRR1208594 SRR1208596 SRR1208602 SRR1208605 SRR1208623 SRR1208624
SRR1208632 SRR1208638 SRR1208640 SRR1208641 SRR1208656 SRR1208663
SRR1208685 SRR1208687 SRR1208692 SRR1208702 SRR1208711 SRR1208713
SRR1208740 SRR1208747 SRR1208748 SRR1208751 SRR1208753 SRR1208754
SRR1208766 SRR1208771 SRR1208772 SRR1208778 SRR1208781 SRR1208790
SRR1208795 SRR1208809 SRR1208823 SRR1208825 SRR1208846 SRR1208862
SRR1208869 SRR1208877 SRR1208883 SRR1208884 SRR1208896 SRR1208898
SRR1208902 SRR1208903 SRR1208904 SRR1208907 SRR1208909 SRR1208918
SRR1208920 SRR1208922 SRR1208928 SRR1208991 SRR1208996 SRR1209006
SRR1209007 SRR1209008 SRR1209009 SRR1209010 SRR1209024 SRR1209028
SRR1209031 SRR1209040 SRR1209043 SRR1209052 SRR1209085 SRR1202374
SRR1202376 SRR1202382 SRR1202389 SRR1202390 SRR1202391 SRR1202392
SRR1202393 SRR1202394 SRR1202395 SRR1202398 SRR1202402 SRR1202409
SRR1202426 SRR1202443 SRR1202445 SRR1208206 SRR1208232 SRR1208245
SRR1208254 SRR1208255 SRR1208273 SRR1208282 SRR1208287 SRR1208305
SRR1208308 SRR1208309 SRR1208346 SRR1208347 SRR1208380 SRR1208413
SRR1208438 SRR1208459 SRR1208489 SRR1208490 SRR1208505 SRR1208516
SRR1208540 SRR1208550 SRR1208560 SRR1208564 SRR1208568 SRR1208580
SRR1208581 SRR1208595 SRR1208649 SRR1208652 SRR1208654 SRR1208662
SRR1208664 SRR1208665 SRR1208671 SRR1208679 SRR1208680 SRR1208681
SRR1208729 SRR1208742 SRR1208743 SRR1208760 SRR1208762 SRR1208780
SRR1208782 SRR1208787 SRR1208796 SRR1208806 SRR1208838 SRR1208859
SRR1208889 SRR1208894 SRR1208895 SRR1208899 SRR1208916 SRR1208929
SRR1208945 SRR1208955 SRR1208967 SRR1208968 SRR1208977 SRR1209001
SRR1209002 SRR1209012 SRR1209013 SRR1209017 SRR1209018 SRR1209023
SRR1209025 SRR1209027 SRR1209033 SRR1209051 SRR1209056 SRR1209065
SRR1209074 SRR1209075 SRR1209082 SRR1209083 SRR1209084 SRR769395 SRR769396
SRR769397 SRR769398 SRR769399 SRR769400 SRR769401 SRR769402 SRR769403
SRR769404 SRR769405 SRR769406 SRR769407 SRR769408 SRR769409 SRR769410
SRR769411 SRR769412 SRR769413 SRR769414 SRR769415 SRR769416 SRR769417
SRR769418 SRR769419 SRR769420 SRR769421 SRR769422 SRR769423 SRR769424
SRR769425 SRR769426 SRR769427 SRR769428 SRR769429 SRR769430 SRR769431
SRR769432 SRR769433 SRR769434 SRR769435 SRR769436 SRR769437 SRR769438
SRR769439 SRR769440 SRR769441 SRR769442 ERR380665 ERR380666 ERR380667
ERR380668 ERR380669 ERR380670 SRR014585 SRR014587 SRR042496 SRR042497
SRR042498 SRR364480 SRR493106 SRR493108 SRR546088 SRR546089 SRR606438
SRR606445 SRR606446 SRR610347 SRR610349 SRR610350 SRR610351 SRR610352
SRR610353 SRR610354 SRR776612 SRR796580 SRR847275 SRR580366 SRR330044
SRR149190 SRR136828 SRR2063958 SRR2063931 SRR2063913 SRR2063878 ERR198704
ERR198705 ERR198706 ERR198707 ERR420342 ERR420343 ERR420349 ERR420350

ERR420351 ERR420352 ERR420355 ERR420356 ERR420359 ERR420360 ERR420361
ERR420362 SRR000678 SRR000679 SRR000680 SRR000681 SRR000682 SRR000683
SRR000684 SRR000685 SRR000686 SRR000687 SRR000688 SRR000689 SRR000690
SRR000691 SRR000692 SRR000693 SRR000694 SRR000695 SRR000696 SRR000697
SRR000698 SRR000699 SRR000700 SRR000701 SRR006596 SRR006597 SRR072884
SRR072885 SRR072886 SRR072887 SRR072888 SRR1001728 SRR1009245 SRR1009246
SRR1009247 SRR1009248 SRR1009249 SRR1009250 SRR1009251 SRR1009252
SRR1010338 SRR1010339 SRR1010340 SRR1010341 SRR1010342 SRR1010343
SRR1010344 SRR1010345 SRR1010346 SRR1010347 SRR1010348 SRR1010349
SRR1010350 SRR1010351 SRR1010352 SRR1010353 SRR1010354 SRR1010355
SRR1010356 SRR1010364 SRR1013750 SRR1013751 SRR1017307 SRR1019688
SRR1019690 SRR1022672 SRR1022677 SRR1027674 SRR1027675 SRR1027962
SRR1027966 SRR1027973 SRR1027974 SRR1027975 SRR1027976 SRR1027977
SRR1027978 SRR1030692 SRR1030693 SRR1030694 SRR1042328 SRR1046681
SRR1057161 SRR1057936 SRR1060332 SRR1061354 SRR1061355 SRR1061356
SRR1068211 SRR1140472 SRR1140762 SRR1144630 SRR1144631 SRR1171048
SRR1180229 SRR1185390 SRR1185391 SRR1185392 SRR1185399 SRR1186930
SRR1193177 SRR1193190 SRR1193205 SRR1193215 SRR1193226 SRR1193237
SRR1193627 SRR1193629 SRR1193632 SRR1193634 SRR1199277 SRR1199278
SRR1199279 SRR1199280 SRR1199281 SRR1199282 SRR1199283 SRR1199284
SRR1199285 SRR1199286 SRR1200525 SRR1200526 SRR1204090 SRR1204509
SRR1204512 SRR1204563 SRR1204564 SRR1204565 SRR1204579 SRR1205247
SRR1205249 SRR1205800 SRR1206126 SRR1206127 SRR1206128 SRR1206129
SRR1206130 SRR1206131 SRR1206132 SRR1206133 SRR1206134 SRR1206135
SRR1206136 SRR1206137 SRR1216681 SRR1237881 SRR1237882 SRR1237883
SRR1237890 SRR1237892 SRR1237896 SRR1237903 SRR1237905 SRR1237906
SRR1237907 SRR1240134 SRR1240135 SRR1240136 SRR1240137 SRR1240161
SRR1240162 SRR1240163 SRR1240164 SRR1240165 SRR1240166 SRR1240167
SRR1240168 SRR1240169 SRR1240170 SRR1240171 SRR1240172 SRR1253690
SRR1253691 SRR1253692 SRR1253693 SRR1253694 SRR1253695 SRR1253696
SRR1253697 SRR1253698 SRR1253699 SRR1253740 SRR1253741 SRR1253742
SRR1253743 SRR1253744 SRR1253745 SRR1253746 SRR1253747 SRR1253748
SRR1253749 SRR1253750 SRR1253751 SRR1253752 SRR1253753 SRR1253754
SRR1253755 SRR1253756 SRR1253757 SRR1253758 SRR1253759 SRR1253760
SRR1253761 SRR1253762 SRR1253763 SRR1253764 SRR1253845 SRR1253846
SRR1253847 SRR1253848 SRR1253849 SRR1253850 SRR1253851 SRR1253852
SRR1253853 SRR1253854 SRR1253855 SRR1253856 SRR1253857 SRR1253858
SRR1253859 SRR1253860 SRR1253861 SRR1253862 SRR1253863 SRR1253864
SRR1253865 SRR1253866 SRR1253867 SRR1253868 SRR1253869 SRR1253870
SRR1253871 SRR1253872 SRR1253873 SRR1253874 SRR1253875 SRR1253876
SRR1253877 SRR1253878 SRR1253879 SRR1253880 SRR1253881 SRR1253882
SRR1253883 SRR1253888 SRR1253889 SRR1253890 SRR1253891 SRR1253892

SRR1253893 SRR1253894 SRR1253895 SRR1253896 SRR1253897 SRR1253898
SRR1253899 SRR1253900 SRR1253901 SRR1253902 SRR1253903 SRR1253904
SRR1253905 SRR1253906 SRR1253907 SRR1253930 SRR1253931 SRR1253932
SRR1253933 SRR1253934 SRR1253935 SRR1253974 SRR1253975 SRR1253976 SRR125526
SRR1291031 SRR1291960 SRR1294380 SRR1294381 SRR1294382 SRR1294383
SRR1294385 SRR1294386 SRR1294387 SRR1294388 SRR1294389 SRR1294390
SRR1294391 SRR1294392 SRR1294393 SRR1294394 SRR1294395 SRR1294402
SRR1294405 SRR1294414 SRR1294415 SRR1294416 SRR1294417 SRR1294418
SRR1294420 SRR1294421 SRR1294425 SRR1294426 SRR1294428 SRR1294429
SRR1294430 SRR1294431 SRR1294432 SRR1294433 SRR1294434 SRR1294435
SRR1294436 SRR1294441 SRR1294442 SRR1294443 SRR1294444 SRR1294454
SRR1294455 SRR1294456 SRR1294457 SRR1296700 SRR1296709 SRR1296711
SRR1296745 SRR1296746 SRR1296747 SRR1296755 SRR1296762 SRR1296763
SRR1296767 SRR1296770 SRR1296771 SRR1296772 SRR1296773 SRR1296774
SRR1296775 SRR1296776 SRR1296777 SRR1296778 SRR1296779 SRR1296780
SRR1296781 SRR1296782 SRR1296795 SRR1296797 SRR1296798 SRR1296799
SRR1296800 SRR1296801 SRR1296803 SRR1296808 SRR1296809 SRR1296819
SRR1296820 SRR1296837 SRR1296838 SRR1296846 SRR1296847 SRR1296848
SRR1296849 SRR1296850 SRR1296855 SRR1296862 SRR1296863 SRR1296873
SRR1296877 SRR1296884 SRR1296886 SRR1296892 SRR1296893 SRR1296894
SRR1296899 SRR1296909 SRR1296910 SRR1296911 SRR1296912 SRR1296918
SRR1296919 SRR1296920 SRR1296921 SRR1296922 SRR1296923 SRR1296924
SRR1296925 SRR1296926 SRR1296927 SRR1296930 SRR1296936 SRR1296937
SRR1296938 SRR1296939 SRR1296940 SRR1296944 SRR1296945 SRR1296946
SRR1296958 SRR1296963 SRR1296964 SRR1296966 SRR1296967 SRR1296977
SRR1296978 SRR1296986 SRR1296987 SRR1296988 SRR1296989 SRR1296990
SRR1296992 SRR1296993 SRR1296996 SRR1300212 SRR1300214 SRR1300216
SRR1300217 SRR1300218 SRR1300229 SRR1300230 SRR1300231 SRR1300232
SRR1300242 SRR1300263 SRR1300264 SRR1300265 SRR1300266 SRR1300267
SRR1300271 SRR1300272 SRR1300273 SRR1300274 SRR1300290 SRR1300291
SRR1300292 SRR1300293 SRR1300294 SRR1300302 SRR1300303 SRR1300304
SRR1300305 SRR1300309 SRR1300333 SRR1300334 SRR1300335 SRR1300336
SRR1300337 SRR1300343 SRR1300344 SRR1300345 SRR1300360 SRR1300361
SRR1300362 SRR1300363 SRR1300367 SRR1300368 SRR1300369 SRR1300371
SRR1300372 SRR1300374 SRR1300381 SRR1300385 SRR1300387 SRR1300388
SRR1300389 SRR1300390 SRR1300391 SRR1300393 SRR1300394 SRR1300396
SRR1300397 SRR1300398 SRR1300399 SRR1300400 SRR1300401 SRR1300407
SRR1300408 SRR1300409 SRR1300410 SRR1300411 SRR1300412 SRR1300413
SRR1300414 SRR1300433 SRR1300435 SRR1300436 SRR1300444 SRR1300446
SRR1300448 SRR1300449 SRR1300452 SRR1300462 SRR1300463 SRR1300464
SRR1300470 SRR1300471 SRR1300472 SRR1300473 SRR1300474 SRR1300492
SRR1300494 SRR1300495 SRR1300496 SRR1300499 SRR1300500 SRR1300501

SRR1300503 SRR1300504 SRR1300505 SRR1300509 SRR1300510 SRR1300516
SRR1300518 SRR1300521 SRR1300525 SRR1300526 SRR1300528 SRR1300529
SRR1300530 SRR1300532 SRR1300534 SRR1300535 SRR1300538 SRR1300541
SRR1300543 SRR1300544 SRR1300545 SRR1303115 SRR1328074 SRR1328075
SRR1328076 SRR1328077 SRR1425832 SRR1425833 SRR1425834 SRR1427729
SRR1441420 SRR1441700 SRR1441825 SRR1448249 SRR1448250 SRR1448251
SRR1448252 SRR1448253 SRR1448254 SRR1448256 SRR1448260 SRR1448262
SRR1448289 SRR1448290 SRR1448291 SRR1448292 SRR1448293 SRR1448294
SRR1448295 SRR1448296 SRR1448298 SRR1448299 SRR1448300 SRR1448301
SRR1448311 SRR1448312 SRR1462396 SRR1501077 SRR1544599 SRR1596625
SRR1596626 SRR1596627 SRR1596628 SRR1596629 SRR1596630 SRR1596631
SRR1596632 SRR1611147 SRR1611150 SRR1617543 SRR1617548 SRR1617591
SRR1617594 SRR1617597 SRR1617598 SRR1635158 SRR1635611 SRR1686814
SRR1686816 SRR1686834 SRR1686835 SRR1686837 SRR1686838 SRR1686839
SRR1686840 SRR1686841 SRR1686843 SRR1686844 SRR1686846 SRR1686847
SRR1686849 SRR1686851 SRR1686852 SRR1686854 SRR1686858 SRR1686859
SRR1686861 SRR1686862 SRR1686863 SRR1686864 SRR1686865 SRR1686866
SRR1686867 SRR1686868 SRR1686869 SRR1686870 SRR1686871 SRR1686872
SRR1686873 SRR1686874 SRR1686875 SRR1686876 SRR1687463 SRR1688294
SRR1688295 SRR1688296 SRR1688298 SRR1688300 SRR1688303 SRR1688306
SRR1688313 SRR1688314 SRR1688315 SRR1688316 SRR1688317 SRR1688318
SRR1688319 SRR1688320 SRR1688321 SRR223487 SRR223488 SRR223489 SRR223490
SRR350097 SRR360776 SRR396771 SRR396775 SRR401853 SRR401854 SRR401855
SRR401856 SRR401857 SRR401858 SRR401859 SRR401860 SRR401861 SRR412532
SRR414926 SRR414927 SRR414928 SRR414929 SRR414930 SRR496753 SRR497890
SRR497891 SRR514785 SRR514786 SRR514787 SRR514788 SRR514789 SRR567910
SRR567916 SRR596563 SRR627741 SRR629971 SRR629972 SRR629973 SRR629974
SRR629975 SRR629976 SRR629977 SRR629978 SRR629979 SRR629980 SRR629981
SRR629982 SRR629983 SRR629984 SRR629985 SRR629986 SRR629987 SRR629988
SRR629989 SRR653436 SRR660151 SRR663248 SRR663452 SRR667174 SRR768319
SRR800048 SRR828647 SRR828648 SRR828649 SRR828650 SRR828651 SRR828652
SRR828653 SRR828654 SRR828655 SRR828656 SRR828657 SRR828658 SRR828659
SRR830486 SRR830491 SRR833564 SRR924103 SRR934650 SRR934651 SRR942639
SRR953458 SRR953459 SRR953460 SRR953461 SRR953462 SRR953463 SRR953464
SRR953465 SRR953466 SRR953467 SRR953468 SRR953469 SRR953470 SRR953471
SRR953472 SRR953473 SRR953474 SRR953475 SRR971513 SRR974156 DRR013994
DRR013995 DRR013996 DRR013997 DRR013998 ERR475327 ERR475328 ERR475329
ERR475330 ERR475331 ERR475332 ERR475333 ERR475334 ERR475335 ERR475336
ERR475337 ERR475338 ERR475339 ERR475340 ERR475341 ERR475342 ERR475343
ERR475344 ERR475345 SRR1015285 SRR1015322 SRR1015324 SRR1171016 SRR1296481
SRR1301999 SRR1302010 SRR1302020 SRR1378334 SRR1378622 SRR1378623
SRR1378624 SRR1378625 SRR1378626 SRR1378627 SRR1378628 SRR1378629

SRR1915829 SRR1915851 SRR1974489 SRR1974490 SRR2010685 SRR2010686
SRR2029383 SRR2029384 SRR2029386 SRR2029387 SRR2029388 SRR2040553
SRR2040557 SRR402039 SRR402041 SRR402042 SRR402043 SRR402044 SRR402045
SRR402046 SRR402047 SRR1974488 SRR1974491 SRR1974493 SRR1974494 SRR1974495
SRR1974496 SRR1974497 SRR1974498 SRR1974499 SRR1974500 SRR1974501
SRR1974502 SRR1974503 SRR1974504 SRR1974505 SRR1974506 SRR1974507
SRR1974508 SRR1974509 SRR1974510 SRR1974511 SRR1974512 SRR1974513
SRR1974514 SRR1974515 SRR1974516 SRR1974517 ERR843914 ERR843916 ERR843917
ERR843918 ERR843919 ERR843920 ERR843921 ERR843923 ERR843925 ERR843929
ERR843931 ERR843932 ERR843935 ERR843936 ERR843937 ERR843938 ERR843939
ERR843940 ERR843942 ERR843946 ERR843948 ERR843949 ERR843950 ERR843955
ERR843964 ERR843966 ERR843967 ERR843968 ERR843969 ERR843973 ERR843980
ERR843981 ERR843982 ERR843987 ERR843988 ERR843989 ERR843992 ERR843994
ERR843995 ERR843996 ERR843997 ERR843998 ERR844003 ERR844008 ERR844009
ERR844010 ERR844014 ERR844015 ERR844016 ERR844017 ERR844019 ERR844020
ERR844025 ERR844029 ERR844030 ERR844031 ERR844038 ERR844039 ERR844040
ERR844041 ERR844042 ERR844043 ERR844044 ERR844045 ERR844046 ERR844047
ERR844048 ERR844049 ERR844050 ERR844051 ERR844052 ERR844055 ERR844056
ERR844057 ERR844058 ERR844061 ERR844062 ERR844063 ERR844064 ERR844065
ERR844066 ERR844067 ERR844068 ERR844069 ERR844070 ERR844071 ERR844072
ERR844073 ERR844074 ERR844075 ERR844076 ERR844077 ERR844078 ERR844079
ERR844080 ERR844081 ERR867908 ERR867909 ERR771084 ERR843912 ERR843913
ERR843915 ERR843922 ERR843924 ERR843926 ERR843927 ERR843928 ERR843930
ERR843933 ERR843934 ERR843941 ERR843943 ERR843944 ERR843945 ERR843947
ERR843951 ERR843952 ERR843953 ERR843954 ERR843956 ERR843957 ERR843958
ERR843959 ERR843960 ERR843961 ERR843962 ERR843963 ERR843965 ERR843970
ERR843971 ERR843972 ERR843974 ERR843975 ERR843976 ERR843977 ERR843978
ERR843979 ERR843983 ERR843984 ERR843985 ERR843986 ERR843990 ERR843991
ERR843993 ERR843999 ERR844000 ERR844001 ERR844002 ERR844004 ERR844005
ERR844006 ERR844007 ERR844011 ERR844012 ERR844013 ERR844018 ERR844021
ERR844022 ERR844023 ERR844024 ERR844026 ERR844027 ERR844028 ERR844032
ERR844033 ERR844034 ERR844035 ERR844036 ERR844037 ERR844053 ERR844054
ERR844059 ERR844060 ERR844082 DRR023333 ERR162903 ERR162905 ERR162907
ERR162909 ERR162911 ERR162913 ERR162915 ERR162917 ERR162919 ERR162921
ERR162923 ERR162925 ERR162927 ERR162929 ERR162931 ERR162933 ERR162935
ERR162937 ERR162939 SRR1207979 SRR1210580 SRR1210582 SRR1437997 SRR1437999
SRR1438000 SRR1438001 SRR1438002 SRR1438003 SRR1438004 SRR1438005
SRR1438006 SRR1438007 SRR1438008 SRR1438009 SRR1438010 SRR1438011
SRR1438012 SRR1438013 SRR1438014 SRR1438015 SRR1438016 SRR1438030 ERR198829
ERR198830 ERR198831 SRR1055972 SRR1055973 SRR1055974 SRR1055975 SRR1055976
SRR1055977 SRR1055978 SRR1055979 SRR330112 SRR330113 SRR330114 SRR330115
SRR330116 SRR330117 SRR330118 SRR330119 SRR464176 SRR466223 SRR466335

SRR466446 SRR611810 SRR636530 SRR646409 SRR828645 SRR908430 SRR975462
SRR1033844 SRR1033845 SRR1033846 SRR1033847 SRR1033848 SRR1033849
SRR1033850 SRR1033851 SRR1303490 SRR1303502 SRR1303545 SRR1303546
SRR1303547 SRR1303548 SRR1303549 SRR1303560 SRR1303567 SRR1303580
SRR1303583 SRR1303584 SRR1303607 SRR1303610 SRR1303611 SRR1303612
SRR1303781 SRR1303782 SRR1303783 SRR1303784 SRR1303785 SRR1922550 ERR670500
SRR1232071 SRR1230305 SRR1148579 SRR1010632 ERR876019 ERR490934 SRR364522
SRR770450 SRR1157834 SRR1686734 SRR1097801 SRR1103500 SRR326953 SRR1051091
ERR713844 ERR688008 SRR1566247 ERR129100 SRR1801761 ERR749100 ERR356819
ERR161879 ERR234919 SRR631322 SRR1732574 SRR1560245 ERR227019 SRR1153339
ERR903695 SRR374364 SRR922489 ERR653270 SRR1980037 ERR737347 SRR327026
ERR366407 SRR1957747 ERR039477 ERR084561 SRR830470 ERR325400 ERR256941
ERR279501 SRR231808 SRR1050515 SRR1947775 SRR834917 SRR1685369 ERR023500
SRR1145737 ERR042200 SRR2076000 SRR909737 ERR038649 SRR1272897 SRR921503
ERR353350 SRR895988 SRR1916804 ERR119420 SRR1573551 ERR758631 SRR946461
SRR1959717 ERR047936 ERR579114 SRR1248931 SRR390316 SRR1274800 SRR1025902
SRR1299397 SRR1996214 SRR1820091 SRR1618496 ERR123904 SRR036874 SRR292342
SRR1752100 ERR256831 ERR730410 SRR1613889 SRR1643164 ERR225607 ERR540702
SRR1586053 ERR111454 SRR1293379 SRR1163474 SRR1014692 ERR634096 SRR496997
SRR1515947 SRR534491 SRR1522064 SRR2066774 SRR1012200 SRR039733 SRR1173800
ERR713107 SRR2051435 ERR114492 ERR271088 SRR353761 SRR528146 ERR251752
SRR1798561 SRR1167000 SRR1049700 SRR2048636 SRR1143300 SRR497015 SRR2037218
ERR033100 SRR148713 ERR331185 SRR1054117 SRR940275 SRR1101501 SRR1163177
SRR1986522 SRR952344 SRR286682 SRR1698180 SRR066603 SRR1956848 ERR271764
ERR493470 ERR439300 SRR1166600 SRR617425 ERR656315 SRR959153 SRR1174881
ERR434892 ERR109642 SRR576621 ERR185998 ERR926626 SRR1982010 SRR1159064
SRR495102 SRR1144768 SRR218498 SRR036203 SRR116812 SRR077497 ERR494617
SRR1981946 SRR1799420 SRR1709055 SRR1182463 SRR1200749 SRR096084 SRR1951985
SRR961989 SRR1798600 ERR418393 SRR005736 ERR126900 ERR197195 SRR651738
SRR546301 ERR419283 SRR1973900 SRR1314607 SRR2068008 SRR139099 SRR1201362
SRR006465 SRR1217782 ERR689069 SRR749060 SRR1931171 ERR387459 SRR1998936
SRR072400 SRR020179 SRR772340 SRR1105663 ERR142311 ERR453458 SRR1039781
SRR1975190 SRR1166082 SRR2066432 SRR1988186 ERR039363 SRR1508248 ERR228121
SRR1226754 SRR1640316 SRR340006 ERR246900 ERR516407 SRR896362 SRR639118
ERR743266 SRR1871338 SRR358953 SRR1929654 SRR896434 SRR1639590 ERR572847
SRR1147979 SRR787434 SRR715100 SRR786007 SRR917600 SRR441575 SRR490124
SRR041663 SRR522873 SRR1233849 SRR1159800 SRR1147679 SRR342352 SRR1295572
ERR200267 SRR1533150 SRR1175455 ERR657992 ERR233700 SRR599564 ERR692072
ERR044160 SRR1171100 ERR023300 ERR298356 ERR579313 SRR315790 SRR892501
SRR826782 SRR1849304 SRR612119 ERR068083 ERR434788 SRR729310 SRR956873
SRR726438 DRR031997 SRR1238791 ERR436391 SRR346405 SRR184513 SRR643873
SRR2015800 SRR1633500 ERR271337 SRR015696 SRR107718 ERR054357 SRR651301

SRR067501 SRR1966148 SRR436900 ERR671908 SRR785017 ERR570058 ERR433427
SRR1021459 SRR404304 SRR1165892 SRR1757502 SRR1264545 SRR900925 ERR181676
ERR197400 SRR1232605 SRR1481630 SRR316685 SRR493284 ERR015950 SRR060847
SRR1501700 ERR059957 ERR586698 ERR498072 SRR029606 SRR1258435 ERR164645
SRR1302896 SRR1145991 ERR245836 SRR768247 SRR974686 ERR739200 SRR013340
SRR1285991 SRR081481 SRR1151300 ERR140832 SRR1258881 SRR1165299 SRR882110
ERR352341 SRR064213 ERR697100 SRR958325 ERR234214 SRR1636038 SRR1205788
SRR953226 SRR339983 SRR642344 SRR517591 ERR470539 SRR652139 SRR988425
SRR1190026 ERR176046 SRR1923640 SRR1552349 SRR1239108 ERR118538 SRR1200251
SRR2039654 SRR638039 ERR765900 ERR114965 ERR346710 ERR583404 ERR658229
SRR1049140 SRR033887 SRR317498 ERR142610 SRR1999316 SRR2100208 SRR070852
ERR222800 SRR1967155 SRR1968455 SRR1185301 SRR961681 SRR769955 ERR925900
ERR495240 ERR278300 SRR1149980 ERR347529 ERR029300 SRR1161301 SRR518759
ERR360629 SRR350073 SRR946304 SRR1960087 SRR1792384 SRR1965726 SRR866921
ERR190500 ERR022119 SRR1609067 SRR1995500 SRR504828 SRR201790 SRR1407786
SRR073220 SRR578765 ERR048500 SRR1166949 SRR797242 ERR588858 SRR1736253
SRR550171 ERR175848 SRR2047518 DRR015577 ERR137982 SRR1725170 ERR045185
ERR316300 SRR849601 ERR842307 ERR473802 ERR374368 ERR566631 SRR1186517
SRR1922806 SRR1525006 SRR1068300 SRR1167800 SRR400040 SRR1218829 ERR388700
SRR2080386 SRR1174245 ERR046059 ERR193281 SRR124112 SRR935872 SRR2075100
SRR1660283 SRR022646 SRR1371021 ERR484079 SRR1225397 ERR829321 SRR515625
SRR2001634 SRR1017300 ERR363315 SRR413932 ERR024700 SRR671869 SRR062543
SRR609202 SRR035431 ERR304826 ERR135800 ERR046159 SRR1185425 SRR765100
SRR1148179 SRR1103275 ERR067786 SRR2015204 DRR016446 ERR494521 ERR028600
ERR048600 SRR1636700 ERR552041 ERR505956 ERR273820 ERR279209 ERR730182
ERR868558 ERR120028 SRR090600 ERR038300 SRR152353 SRR1587772 SRR500471
ERR303233 SRR786949 ERR653156 SRR935472 ERR369938 SRR599118 SRR1722867
SRR748508 SRR353400 ERR551410 ERR341259 SRR631071 SRR1048301 SRR1686039
SRR106820 ERR448800 ERR431231 SRR1779408 SRR1973599 SRR940341 SRR1103669
SRR1449671 SRR954505 SRR1821276 SRR863372 SRR1818276 SRR1146329 SRR1951504
SRR1425958 SRR2101009 ERR008613 SRR1249000 SRR957820 ERR257598 SRR1544064
ERR757215 ERR472988 SRR619318 SRR1655910 SRR391021 ERR601537 ERR460653
SRR1183745 SRR1630825 ERR030000 SRR495601 SRR1562592 SRR1029539 SRR1720556
DRR000841 ERR689490 SRR2044915 ERR578033 SRR1157585 SRR1329807 SRR2029583
SRR2045883 SRR030252 SRR713497 SRR2032525 SRR833196 SRR1959120 SRR096812
SRR402738 ERR319231 ERR170850 SRR1602500 SRR010961 SRR1753747 ERR505290
SRR1272766 SRR1367198 SRR1810848 SRR1262380 SRR916075 SRR1645183 ERR108380
SRR017708 SRR1761796 ERR376806 SRR1106400 SRR873847 DRR030767 ERR694494
ERR005143 ERR104658 ERR411292 SRR198001 SRR957171 SRR1614814 SRR1307721
ERR636248 SRR333561 SRR1960902 SRR1710100 SRR017355 SRR1534900 SRR1451242
ERR226200 DRR018794 SRR1062900 SRR1609993 SRR360471 ERR144578 ERR541047
ERR439745 ERR592101 ERR486544 SRR631732 SRR2050938 ERR388280 ERR212875

SRR065616 SRR1993644 SRR535700 SRR1544281 SRR059040 SRR1015203 SRR1422648
SRR1291412 ERR334499 SRR1762624 ERR662800 SRR678033 SRR899426 ERR473149
SRR1261336 SRR1289659 SRR2100703 ERR863224 SRR1582674 DRR003192 SRR516354
ERR237600 SRR1163301 SRR489154 SRR004468 SRR1010424 SRR1523275 SRR1019709
SRR1870756 ERR526292 SRR534500 SRR846967 SRR1214755 ERR716209 SRR1571579
ERR119082 SRR1212190 SRR1180202 ERR171821 SRR386900 ERR419600 SRR1025515
SRR1738016 ERR326136 SRR1267901 SRR527733 ERR551063 SRR1215601 SRR999644
ERR266408 SRR1206476 SRR1966450 ERR217403 ERR163730 ERR599398 SRR351245
SRR900440 ERR704371 DRR030443 SRR1220136 SRR067798 ERR361821 SRR1819749
ERR450419 SRR1015465 SRR1270100 SRR2035385 SRR784102 SRR1270858 ERR064155
ERR629092 SRR1658081 SRR1799133 ERR032135 SRR1724211 ERR554480 SRR1555352
SRR850728 ERR375854 SRR1554258 SRR1709345 ERR414089 ERR706104 SRR621986
SRR352314 SRR610904 ERR632862 SRR1439619 SRR498188 SRR1965200 SRR1219962
SRR1523196 SRR1576123 SRR1566600 ERR434061 ERR109300 SRR496386 SRR839221
SRR932000 SRR972394 ERR158979 SRR1148879 ERR172493 SRR1800004 SRR1801934
SRR1607290 SRR1001700 SRR1584520 SRR364360 SRR567298 SRR1943299 ERR050016
ERR107871 SRR927595 ERR585845 SRR457288 SRR2054121 ERR586367 ERR228428
SRR447490 SRR969033 SRR1791764 ERR593200 SRR1754165 SRR1958456 SRR835910
SRR1948177 SRR1765575 SRR1587600 SRR1175004 SRR1612626 SRR1324585 SRR122384
SRR825577 SRR1632877 SRR1685900 ERR156437 ERR505800 SRR1592400 SRR1146469
SRR2067916 SRR180576 SRR1792484 SRR1227551 SRR1769027 SRR1229381 ERR525300
SRR1287824 SRR125401 SRR1781586 SRR2075771 SRR1695486 SRR005656 ERR348900
SRR537020 SRR1137821 ERR527219 SRR1793520 SRR043200 ERR137275 SRR1945089
ERR664778 SRR1533624 ERR196747 SRR989790 ERR554502 SRR801800 SRR385953
ERR577854 SRR1003320 SRR1169872 SRR1524955 SRR522154 SRR1410038 ERR060234
SRR1618349 SRR1708046 SRR364078 ERR490744 ERR350075 SRR1030609 ERR055714
SRR1340400 SRR1188339 SRR896246 ERR228212 SRR1524044 SRR1177285 SRR345600
ERR108275 SRR278164 SRR1505237 SRR1519879 ERR246661 ERR461347 SRR1239340
SRR094442 ERR387554 SRR1225402 ERR047892 ERR064200 ERR097413 SRR1060494
SRR1299215 SRR1955607 ERR316650 SRR656741 SRR1217003 SRR1328290 SRR1148779
SRR959022 SRR1177900 SRR390431 SRR1768424 SRR031126 SRR951542 SRR1981612
SRR114862 ERR730819 SRR1981222 ERR226150 SRR019008 SRR1631654 SRR028684
SRR641386 SRR314729 SRR1141652 SRR1014498 DRR023946 SRR1049822 SRR020200
SRR1707090 SRR1769749 ERR450284 ERR449514 SRR036709 SRR1013600 SRR1573222
SRR332555 SRR1637012 SRR1752738 ERR550500 SRR1522331 SRR639454 SRR040410
SRR1141238 SRR932182 SRR1567873 ERR403700 SRR1461909 ERR903360 SRR922307
ERR369342 ERR502400 SRR1640221 SRR490938 SRR1965192 SRR2080622 ERR886072
SRR681624 SRR1214005 SRR1201809 SRR1655810 ERR349342 SRR1290900 SRR1918944
ERR233875 ERR042137 SRR1592124 SRR1481922 ERR297100 SRR1963604 ERR538090
SRR388699 SRR599800 SRR1329973 SRR016114 SRR571158 SRR1029664 ERR406247
SRR1696960 ERR662796 ERR103394 ERR025600 ERR493843 SRR1514807 ERR071988
SRR1745475 SRR1219642 SRR891709 SRR713315 ERR191800 ERR024000 SRR2077386

SRR909270 SRR1202980 ERR036340 ERR026000 ERR594183 ERR712636 SRR2012765
ERR019400 ERR142104 SRR1218553 ERR714980 SRR389089 SRR1236349 SRR1714116
SRR305194 SRR953842 ERR599874 SRR1233257 SRR1174940 SRR1509569 ERR474040
SRR020045 SRR1569686 SRR1786283 ERR673678 SRR1334555 SRR1586544 SRR1735266
SRR1535658 SRR1208412 SRR059930 SRR359304 ERR377354 ERR439096 ERR543957
SRR628695 SRR2072483 SRR1229962 ERR126612 DRR000564 SRR1763625 SRR190219
SRR714251 SRR1222753 SRR036015 DRR023000 SRR098973 SRR2005734 SRR2040142
ERR688655 SRR1967255 SRR1302798 SRR1011990 SRR1956760 SRR2024476 ERR196387
SRR1786972 SRR709476 SRR1693400 SRR1393336 ERR340492 ERR583541 SRR1657607
SRR1266702 ERR911919 SRR535100 SRR672720 SRR142700 SRR1207526 SRR1170779
SRR1165909 SRR847600 SRR1035128 SRR445017 SRR747871 ERR212905 ERR233160
SRR1149832 SRR622460 SRR647343 SRR1284786 SRR764543 ERR211699 SRR1618830
SRR1296010 SRR039400 SRR948573 SRR447002 ERR666954 ERR057800 SRR1324761
SRR1806277 SRR2000327 SRR496890 ERR318504 SRR070319 SRR1552084 DRR008448
SRR1732239 SRR1597500 SRR155596 SRR520228 SRR1181540 SRR1801275 SRR090575
SRR074870 SRR1147779 SRR074108 SRR097473 SRR1203043 ERR134801 ERR744312
SRR071903 SRR407381 SRR329496 SRR1363497 SRR2059984 SRR641278 ERR592673
ERR670492 DRR013332 SRR1056127 SRR563448 SRR915674 ERR600539 SRR845772
SRR497559 SRR1702362 SRR1995737 SRR1988400 ERR016900 SRR034201 SRR398192
ERR148817 ERR152374 ERR517306 ERR163138 ERR713449 ERR418785 ERR715801
ERR778722 SRR191830 SRR1980730 ERR553806 SRR650219 ERR019800 ERR466207
SRR1049496 ERR357909 SRR256390 ERR083915 SRR463293 ERR676583 SRR1687071
SRR068600 SRR1107610 SRR389790 SRR2064653 SRR709926 SRR1959470 SRR1158110
SRR1122600 SRR494492 SRR1961727 SRR1375000 ERR218154 ERR501544 SRR828415
SRR1166100 SRR212957 ERR212003 ERR351319 SRR1217304 SRR203478 SRR931700
ERR323033 ERR129855 ERR005824 SRR1172020 ERR718465 ERR536984 SRR927400
SRR1955500 SRR331230 SRR638895 SRR1996134 ERR314415 SRR1047600 ERR017200
SRR1259680 SRR1653356 SRR1196466 ERR498136 SRR962010 ERR496647 SRR1209393
SRR1560091 ERR023400 ERR519785 SRR1090978 SRR189247 SRR1344835 ERR133682
SRR770134 SRR868754 SRR1615100 ERR587446 ERR563964 SRR652067 SRR1030347
SRR952664 SRR1702755 SRR1708905 SRR592715 ERR658903 ERR125209 SRR1927080
SRR1196906 SRR2039700 ERR540368 SRR1303627 SRR1790463 ERR485900 SRR1168525
SRR1303924 ERR460163 SRR1067910 SRR1598800 SRR1449919 SRR1593261 SRR534850
SRR1583516 SRR1754807 SRR000197 SRR1735365 ERR714384 SRR1297006 SRR1634664
SRR1223512 SRR611410 SRR955202 ERR162597 ERR192233 SRR096322 ERR226405
SRR1374952 SRR1216455 SRR646513 SRR1048900 ERR374024 SRR1705587 SRR1979446
SRR922251 SRR1664191 ERR657408 SRR149194 SRR248044 ERR161537 ERR380602
SRR489291 SRR1101443 SRR2062051 ERR885638 SRR2009585 ERR718348 SRR037144
SRR057353 ERR400500 SRR849709 SRR1557000 SRR1968355 ERR376696 SRR1290862
ERR435568 ERR347429 SRR969355 SRR253093 ERR063641 ERR915364 SRR1649517
SRR513132 SRR866839 SRR1197644 ERR458470 SRR1161212 ERR410760 ERR231645
SRR1042833 SRR504905 ERR388848 ERR899729 SRR568100 ERR636419 SRR1571600

ERR473759 SRR400848 SRR1588570 SRR1185098 ERR190411 SRR1561162 ERR175741
ERR196191 ERR048471 SRR630100 ERR632226 ERR222795 SRR643008 SRR1013527
ERR374400 ERR190331 SRR1165100 ERR471310 SRR784212 ERR497024 SRR554305
ERR588700 SRR1995498 SRR136784 SRR671769 SRR1802858 SRR1165093 SRR403876
SRR728902 ERR015803 SRR1963500 ERR793242 SRR1648457 SRR1706186 ERR028500
SRR1720446 ERR316257 ERR654488 ERR038400 SRR1041118 SRR022554 ERR024800
ERR760715 SRR1635069 SRR1164600 SRR801638 ERR193300 ERR266553 ERR349236
SRR005032 SRR400902 SRR1449535 SRR785622 SRR960868 SRR353559 ERR731222
SRR1207440 SRR1167798 SRR1557947 SRR1103366 ERR219200 ERR135722 SRR1982200
SRR1185592 SRR1970559 SRR1523343 SRR900716 SRR341431 ERR701619 SRR515552
SRR024048 SRR772254 ERR294400 ERR637401 ERR036497 ERR029449 SRR1988500
ERR382121 ERR732900 SRR1634576 SRR873632 SRR1403641 SRR388324 ERR274125
ERR245091 SRR1797604 ERR784389 SRR1304634 ERR044200 SRR1763864 SRR1149679
SRR493107 SRR2077404 ERR056688 SRR000207 ERR708690 SRR1048423 SRR835423
SRR1301040 SRR1695602 ERR363900 SRR1915424 SRR1238800 ERR376090 SRR404401
ERR271419 SRR1183601 SRR1104963 SRR222576 SRR1328170 SRR1795507 ERR238745
SRR097259 SRR389110 SRR677780 SRR825613 SRR959374 SRR1929821 SRR1554382
ERR580459 SRR1049240 ERR046952 SRR1805600 ERR110798 SRR1592312 SRR988668
SRR1003900 ERR485000 SRR1177887 SRR1020000 SRR1169576 SRR1258339 SRR1151271
ERR586500 SRR210778 SRR1165788 SRR1212970 ERR134700 SRR1012129 SRR974700
SRR065000 SRR1124794 SRR029579 SRR638740 ERR352476 SRR957041 SRR1010521
SRR931685 SRR1169325 ERR697253 ERR346691 SRR650460 SRR223485 SRR139110
SRR1822600 SRR1225229 SRR1642937 ERR406977 SRR2073244 SRR611611 SRR015700
ERR330694 SRR317502 ERR054409 SRR644306 SRR1811566 ERR148286 ERR019700
SRR518692 ERR305882 ERR052000 ERR197582 SRR1162364 SRR797189 DRR003209
ERR171901 SRR1614074 SRR1777993 ERR702412 SRR2100802 SRR1505404 SRR1958656
SRR949994 ERR419784 SRR1871413 SRR1204789 SRR609896 SRR004368 SRR926600
ERR026791 ERR662294 ERR070054 SRR1177129 SRR550209 ERR233913 ERR131800
ERR031053 SRR918600 SRR1917104 DRR006271 SRR1424842 ERR054970 SRR811935
SRR1552456 SRR1184701 SRR585694 SRR1174150 SRR1179210 SRR124277 SRR488352
SRR217372 SRR1340396 DRR014528 SRR1215300 ERR085402 SRR1810035 SRR1596495
SRR851825 SRR1015315 SRR899517 ERR222631 ERR343431 ERR352061 ERR551178
SRR2062770 SRR446554 SRR1025678 ERR311529 SRR1214863 SRR342224 ERR170970
SRR530182 ERR484994 ERR584380 SRR654200 ERR107785 SRR1425835 ERR249213
SRR1616068 ERR361029 ERR758379 SRR1966350 ERR570162 SRR1908924 SRR1186465
SRR850805 ERR738800 SRR059811 SRR076007 SRR1958048 SRR392454 SRR049100
SRR394143 SRR1519074 ERR062874 SRR189086 SRR935905 SRR1148079 ERR257880
ERR059720 SRR1562600 ERR732667 SRR486157 SRR030385 SRR2032826 SRR891810
SRR1230626 SRR1017057 ERR360757 SRR090460 SRR1001694 SRR1664685 ERR237704
SRR1172809 SRR950662 SRR058081 ERR333865 SRR1685861 ERR017300 SRR1923100
SRR147300 SRR018971 SRR1293629 SRR1798101 ERR387074 SRR1656311 ERR199994
SRR2054241 SRR1211748 ERR190807 SRR1745270 SRR1960810 SRR1916072 SRR857263

SRR906357 SRR1722712 SRR649827 SRR1503355 ERR431374 SRR1728720 SRR863221
SRR1709262 SRR489378 SRR954404 ERR484219 SRR498442 SRR785913 ERR369832
ERR901478 SRR599220 ERR551505 ERR063500 SRR2002633 ERR477376 SRR949448
ERR601629 DRR017885 SRR017249 SRR981225 SRR157506 ERR467107 SRR1720753
ERR505767 SRR1609856 SRR1103701 SRR386033 SRR1286744 SRR765065 ERR331391
SRR2007326 SRR947237 ERR044937 SRR933401 SRR1531102 ERR450523 SRR1009263
SRR1784622 SRR2043367 SRR065715 SRR1636881 SRR1274789 SRR1657101 SRR580583
SRR606318 SRR688107 SRR1645200 SRR1810501 SRR137200 DRR003900 SRR1424581
SRR1544333 SRR343085 ERR486687 SRR1158200 SRR058935 SRR1553345 ERR653981
SRR1761800 SRR125284 ERR925895 SRR1966955 SRR1914400 SRR528760 ERR046800
SRR1973617 SRR308181 SRR1209435 ERR319337 SRR1534814 SRR799785 SRR1586195
SRR018585 SRR1408840 SRR1050034 ERR043300 ERR448767 SRR1145886 SRR957726
SRR500035 SRR1181644 SRR1191024 SRR1710077 SRR1732701 ERR027000 SRR1159302
SRR053435 SRR1291031 SRR066805 SRR1411121 ERR129732 SRR639309 ERR687900
SRR017677 SRR1288442 SRR314665 ERR449667 SRR496760 ERR042039 ERR299300
ERR351600 SRR1005674 SRR534288 SRR1460677 SRR1707134 SRR561910 SRR852399
SRR019175 ERR278683 ERR782296 SRR1292900 SRR329936 ERR118613 SRR1049958
SRR392565 SRR530264 ERR777032 SRR1553264 ERR368929 ERR025500 SRR096959
ERR103415 ERR251910 SRR830285 SRR1740549 SRR1769867 SRR350335 SRR1182712
SRR599912 SRR1066876 SRR1974010 SRR231653 SRR1163200 ERR524942 ERR234130
SRR609002 SRR1761524 SRR1959502 ERR562804 SRR1962284 SRR1296680 SRR958003
SRR1573332 ERR863169 ERR594200 SRR1509668 SRR1014500 ERR311600 SRR616246
SRR592829 ERR585780 ERR845240 SRR495433 SRR157498 SRR1101346 SRR1558995
ERR386622 SRR833795 SRR519762 ERR227503 SRR1593934 SRR039560 SRR1569700
SRR961870 SRR1140625 SRR1586221 ERR540273 SRR653721 SRR2057775 SRR2029709
SRR1287230 SRR1236421 SRR1334480 SRR1514988 DRR002764 SRR714175 SRR441714
ERR226500 SRR1744000 SRR653600 ERR840658 SRR032419 ERR502348 ERR126597
SRR909114 SRR948442 SRR2024380 ERR527404 ERR024500 SRR1528925 SRR1122964
SRR576933 SRR1535710 ERR524898 SRR1767783 SRR2014397 SRR1371294 ERR433528
SRR792571 SRR391678 SRR1159200 ERR181759 SRR2071001 SRR1166824 ERR022845
SRR034317 SRR071140 SRR1046302 SRR1144554 SRR2071968 SRR1011815 SRR1569800
SRR1334629 ERR264425 SRR784311 SRR953900 SRR1981300 SRR593200 SRR231104
SRR031076 DRR021932 SRR1167245 ERR714056 SRR043168 ERR387600 SRR413855
ERR736754 SRR1958796 ERR131796 ERR156300 SRR1171871 SRR1189807 SRR386700
SRR1948052 ERR716361 ERR712966 SRR833232 SRR940498 SRR494957 ERR532261
SRR334177 SRR1695593 SRR1122500 SRR1633229 ERR084300 SRR629551 ERR108154
SRR049240 ERR037234 ERR496738 ERR022075 SRR1559006 SRR1802918 SRR1170834
SRR1137734 SRR032607 SRR1148679 SRR1566177 SRR1214133 SRR1043195 SRR1653464
SRR1633488 ERR316743 ERR411336 ERR117471 SRR1501253 ERR246742 SRR2098944
SRR029823 ERR325380 ERR572625 SRR1817192 ERR016800 SRR1162417 SRR2047253
SRR1572825 SRR116665 SRR960011 ERR730957 SRR925301 ERR576130 SRR1299110
SRR1145126 ERR196251 SRR036606 SRR1300653 SRR497602 SRR1200552 SRR1293503

SRR1532569 ERR752926 SRR1969176 SRR1564305 SRR965745 SRR397938 SRR925202
ERR559267 SRR1981700 SRR546564 ERR200017 SRR711188 SRR1239208 SRR1605917
SRR1160718 SRR1574245 ERR557577 SRR070555 ERR372909 SRR806692 ERR193658
SRR1577808 SRR1952700 ERR690200 SRR1147061 SRR1166214 SRR2038200 SRR1955474
SRR394427 ERR473068 SRR500635 SRR586012 SRR1297110 SRR064389 SRR1218214
ERR047453 SRR1787021 SRR1820737 SRR1578059 SRR514816 SRR077212 ERR311029
SRR1180103 ERR696991 ERR564026 ERR045200 SRR681526 ERR501460 SRR502768
ERR370322 SRR1030263 SRR1188220 SRR1344706 SRR1303300 DRR001720 ERR501643
ERR030300 ERR538143 SRR1133228 SRR088309 SRR1222146 ERR366393 SRR1231234
SRR190129 ERR229960 ERR277249 ERR849500 SRR035500 SRR554454 SRR442367
ERR377424 SRR1786143 SRR1946962 SRR1745531 SRR1581002 DRR022782 SRR1284496
SRR1363172 SRR1132900 ERR019338 SRR721172 SRR1107750 SRR605576 SRR1160009
SRR081277 SRR1173534 SRR354202 SRR1518416 SRR341548 SRR1961830 ERR460069
ERR375984 SRR1593374 SRR1993490 ERR361754 SRR519062 SRR1223475 SRR1168604
ERR033400 SRR1087903 SRR401400 ERR904458 SRR1213065 ERR161600 SRR569013
SRR850250 SRR191794 SRR2056977 SRR1230595 ERR599900 ERR129059 ERR137853
ERR440988 ERR776851 SRR1461782 SRR1045121 SRR191911 ERR486769 ERR356169
ERR340518 SRR1615943 DRR023149 SRR1730512 SRR1222634 SRR747900 SRR503579
ERR316802 SRR1191277 ERR230429 SRR1586600 SRR1564736 SRR398096 ERR714600
SRR771214 ERR637949 SRR566976 ERR597518 SRR327445 ERR057793 SRR496610
ERR067800 SRR847775 SRR1025008 SRR1333887 ERR178232 SRR1587595 SRR202932
SRR1006421 SRR924723 SRR647607 ERR137180 SRR972401 ERR120203 SRR408238
SRR520353 SRR587217 SRR1922792 SRR1925721 SRR1574900 SRR1393910 ERR499400
SRR535400 SRR1663100 SRR2000400 SRR1576829 SRR070254 ERR634920 ERR340618
SRR278025 SRR1703162 SRR943983 SRR1539542 DRR013233 SRR835108 SRR867300
ERR460934 SRR1295827 SRR067872 SRR1206352 SRR1164504 ERR334543 SRR403911
SRR960772 ERR713500 ERR875949 SRR513059 ERR348243 SRR1202685 SRR882090
SRR631107 ERR015797 ERR418644 SRR071897 SRR1916370 ERR037948 SRR1647685
SRR835373 SRR1791691 SRR329500 SRR1655209 SRR097528 SRR142654 SRR1089516
SRR1631567 ERR600629 SRR012173 SRR458510 ERR654541 SRR1764945 SRR710256
ERR419800 SRR074004 SRR407430 SRR1379730 SRR1363300 SRR2051385 SRR1393400
SRR663780 ERR861000 SRR1697351 ERR418191 ERR690966 ERR665909 ERR768064
SRR711703 SRR714500 ERR667996 SRR1572007 ERR841676 SRR724224 SRR797943
ERR739516 SRR717835 SRR786435 SRR684500 SRR497954 SRR448075 SRR1161525
SRR2096521 SRR2062626 SRR714003 SRR1179002 SRR387110 SRR1599276 SRR713947
SRR899645 ERR731657 SRR500751 SRR1424714 SRR787500 SRR766781 SRR1185266
SRR1207364 SRR1867867 SRR2080278 ERR871733 SRR2054887 SRR1212830 SRR712317
SRR685337 SRR711200 SRR389250 SRR1029823 SRR921431 SRR535815 SRR1573907
SRR294514 SRR2012199 SRR901000 SRR364900 ERR597264 SRR1524144 SRR707839
SRR388524 SRR2019239 SRR714498 ERR572508 SRR534080 SRR1797139 SRR387290
SRR1523955 SRR387083 SRR1693247 ERR902070 SRR2096459 SRR950007 SRR609956
SRR1609100 SRR716282 SRR711885 SRR811863 SRR713839 ERR160000 SRR871634

SRR1757045 SRR492850 SRR386400 SRR279910 SRR1816870 ERR759453 SRR305910
SRR926334 SRR386542 ERR752438 SRR952247 ERR233478 ERR540675 ERR031448
SRR307053 SRR408750 SRR1949975 SRR068393 ERR375289 SRR869104 ERR584101
SRR1202400 SRR764818 ERR046500 ERR232400 SRR1910447 SRR1265834 ERR009073
ERR003031 ERR375511 SRR088295 SRR611811 SRR900500 SRR2024879 ERR311300
ERR658682 SRR2059548 SRR442042 ERR568649 SRR1196805 ERR587947 SRR029221
ERR676880 ERR181299 SRR1965301 SRR1606331 ERR294188 ERR272242 SRR788730
ERR133737 ERR832399 SRR1041514 SRR1025311 SRR711631 SRR2029170 SRR1976153
ERR124706 ERR120361 SRR1193927 SRR034131 SRR1709815 ERR038044 SRR1179880
SRR445436 SRR1005031 SRR945786 SRR1740400 SRR1964471 SRR993140 ERR730585
ERR339866 ERR731157 SRR1003207 SRR1330200 ERR492257 SRR1721522 SRR534367
SRR2124797 ERR485670 ERR573243 SRR1152001 ERR449093 ERR471280 ERR235297
SRR331094 ERR434498 SRR1182219 ERR760911 SRR1269500 ERR419384 SRR1156953
SRR515125 SRR587638 SRR1224600 SRR1612309 SRR1553673 ERR455536 SRR067232
ERR852660 SRR908516 SRR1226612 ERR037600 SRR1503874 ERR174114 SRR652925
SRR351966 SRR1027713 ERR581151 SRR1573735 SRR151432 ERR233566 ERR355785
SRR935048 ERR449750 SRR1174682 ERR591099 ERR057911 SRR1148479 ERR636622
SRR492929 SRR1962504 SRR1870457 SRR1231384 SRR1175323 DRR013021 ERR590932
SRR287670 ERR420118 SRR1427095 SRR873403 ERR425052 SRR438793 ERR085299
SRR520125 SRR1043653 SRR1391072 SRR285205 SRR773315 ERR031724 SRR1000420
SRR1107425 SRR954937 SRR516784 SRR1223329 SRR965122 ERR411156 SRR1577529
ERR025700 ERR757190 SRR811719 SRR402080 SRR583945 ERR743328 SRR493328
SRR901247 SRR1391281 SRR1162788 ERR592440 ERR772446 SRR850342 SRR1215707
ERR435100 ERR410952 SRR1172916 SRR1318540 SRR1215277 SRR918300 SRR446958
SRR949025 SRR1224857 ERR064674 ERR119800 SRR1182874 SRR1609689 SRR2067262
ERR690857 SRR243754 SRR1510073 SRR1572214 SRR386300 ERR708364 SRR2072100
SRR534900 SRR901518 SRR345189 SRR1050473 ERR084015 SRR1187380 SRR596400
SRR1997906 SRR1944447 ERR375435 SRR1640100 ERR342261 ERR068200 SRR1322184
SRR390910 SRR1336434 SRR1043577 SRR354179 SRR1227303 ERR296668 ERR111918
SRR066410 SRR741908 SRR653134 ERR266617 SRR848065 ERR461648 ERR550628
SRR942045 ERR270705 ERR461019 ERR060005 SRR1962604 SRR1817568 SRR1870311
ERR579873 ERR519382 SRR005932 SRR505727 SRR950920 SRR786105 ERR026500
SRR891408 SRR1707402 SRR537151 ERR440680 SRR1264983 SRR397864 SRR969738
SRR1644035 SRR946202 SRR954064 ERR152759 SRR651966 SRR394848 ERR356026
ERR469993 SRR013483 SRR1292201 ERR540959 SRR1791386 SRR1050700 SRR307138
SRR501455 SRR1576592 ERR850078 DRR002381 SRR1647700 SRR1166327 SRR1215818
SRR1506600 DRR010369 SRR1957947 SRR1202113 SRR1203875 SRR1220548 ERR832450
SRR1617298 ERR126241 SRR1266607 SRR1011079 SRR1104656 SRR634126 SRR1014099
ERR049117 ERR161390 SRR556981 ERR228569 SRR1248776 SRR1813200 ERR197399
ERR056772 SRR980320 ERR474470 ERR455052 ERR263945 SRR353193 SRR386600
SRR098288 SRR466224 SRR220901 SRR1220940 ERR769288 SRR1423719 SRR787321
ERR039572 ERR454498 SRR824843 SRR190575 SRR892637 SRR1188703 SRR2046978

SRR1286055 SRR1273076 SRR1612289 SRR1736718 SRR1191666 SRR2026437
SRR2101112 SRR1011449 SRR1186123 SRR909627 ERR690614 ERR064598 ERR325053
ERR351169 SRR1219845 SRR1645557 SRR1793816 SRR042305 ERR525164 SRR2080956
SRR305897 SRR1528522 ERR744000 ERR663926 SRR647110 SRR652271 DRR035600
SRR641877 ERR211900 SRR011001 SRR1698200 SRR231266 SRR447700 SRR1979204
SRR1631181 SRR1171465 SRR287804 SRR1046969 SRR1271380 DRR031165 ERR310600
SRR1173706 ERR660551 SRR1143291 SRR399333 SRR2036961 SRR1958356 SRR1589599
SRR1737132 SRR1773021 SRR305461 SRR014923 SRR359782 SRR2106399 SRR1054037
SRR1810468 SRR1501618 SRR1521181 SRR557710 ERR476976 SRR639759 ERR298856
SRR1042918 ERR658700 SRR386121 ERR033200 SRR038599 SRR340200 SRR1952000
SRR1063313 SRR575711 ERR311472 SRR189658 ERR033700 SRR1735564 ERR118219
SRR1238137 ERR134400 ERR181314 SRR1027099 SRR1230895 SRR1047200 SRR826438
SRR1303233 SRR531430 SRR522242 SRR054638 ERR473450 SRR1326142 SRR1028126
SRR1164900 ERR204053 SRR1214504 SRR001351 SRR1196702 ERR266107 ERR314085
ERR051987 SRR1785913 SRR1598795 SRR848923 SRR1696472 ERR018818 SRR2011304
ERR047005 ERR599400 SRR474596 SRR2075282 SRR2071440 SRR072982 SRR006752
SRR1147426 SRR1619183 ERR726304 SRR519465 SRR1800674 ERR189811 SRR1051126
SRR1950207 ERR337800 ERR202405 SRR205900 SRR2056302 ERR588633 ERR713966
ERR370214 SRR1144800 SRR1640696 ERR338974 SRR401319 SRR952781 SRR1177581
SRR835867 ERR097233 ERR557800 SRR628704 SRR394001 SRR1257273 SRR1792671
ERR715423 SRR1118600 SRR1147361 SRR1943332 ERR657354 SRR1698422 SRR1708654
SRR064701 SRR1967555 ERR278700 SRR1797305 SRR922500 SRR1988064 SRR2072674
SRR1181130 ERR738333 ERR668000 ERR736933 SRR1265902 ERR600295 SRR1522519
SRR1969676 ERR273480 SRR1558175 SRR326100 ERR089821 ERR192110 SRR1393633
SRR1790876 SRR1969058 ERR460520 ERR178639 SRR393727 SRR1228976 SRR1021743
ERR070563 ERR224434 SRR1655610 SRR1222200 SRR1189703 ERR386777 ERR737002
SRR973274 SRR1229079 SRR1283973 SRR2038674 ERR235126 ERR765896 SRR1772939
SRR1334223 ERR668413 SRR867046 SRR500950 ERR377108 ERR516660 SRR125859
SRR1294208 SRR2052425 SRR610557 SRR1221300 SRR1745971 SRR585826 ERR353163
SRR448131 SRR071445 SRR1605027 SRR1202534 ERR502932 DRR021557 ERR439634
SRR1157600 SRR1180685 ERR247041 SRR349938 SRR454105 ERR541277 SRR446300
SRR070613 SRR685000 SRR648307 SRR2028268 ERR212511 SRR576810 SRR1504997
SRR069984 ERR449248 ERR028900 ERR182371 SRR597663 ERR163513 SRR1046227
ERR089470 ERR119380 SRR1160385 SRR1003067 SRR1057388 SRR1566495 SRR149706
SRR1618669 ERR125373 ERR485549 ERR052470 SRR901306 ERR539866 SRR444973
SRR1185600 SRR018272 SRR022912 SRR1032217 SRR1066691 ERR411988 SRR644788
SRR362961 ERR405186 SRR1734959 SRR1269683 SRR869382 SRR1638855 SRR1871101
ERR718761 SRR452415 SRR1145578 SRR1646354 SRR1752802 ERR352700 SRR640153
ERR730209 SRR515976 SRR1040552 SRR1795908 ERR349886 SRR2125160 ERR027300
SRR1208915 SRR1649236 SRR574017 SRR1511581 SRR769599 ERR693868 ERR330770
SRR388781 SRR038266 SRR800455 SRR755352 SRR1789029 ERR339099 SRR437910
ERR339731 SRR1187618 ERR776452 ERR048897 SRR029156 ERR522800 ERR338165

SRR1282400 SRR1705605 SRR211345 ERR566364 SRR1015085 ERR110806 ERR450184
SRR1511485 ERR591744 SRR1218419 ERR465798 SRR1513270 SRR900202 ERR758404
DRR015762 SRR988722 SRR799324 ERR658500 SRR1796855 SRR1610289 SRR433639
ERR385816 SRR005374 SRR1006138 SRR2007638 SRR1184245 ERR732508 SRR1013902
SRR596397 SRR192663 ERR055000 ERR066176 ERR502176 SRR643101 SRR924403
SRR2049024 ERR046478 ERR406592 SRR2043689 SRR1209037 ERR434398 ERR583985
SRR398627 ERR363600 ERR331062 SRR2032024 ERR702083 SRR647760 SRR254219
ERR298788 SRR1482400 ERR107439 SRR1690962 SRR2101409 SRR1914938 SRR1968255
ERR223126 SRR524814 SRR1592732 SRR784600 ERR351790 ERR125600 SRR1634100
SRR403467 ERR435295 SRR543899 SRR1326314 SRR1765700 ERR438797 SRR1803001
SRR360835 ERR484535 ERR052800 SRR1462007 ERR084103 SRR538068 SRR2014480
SRR1799699 SRR801202 ERR341094 SRR1519188 SRR596232 SRR711395 SRR1960359
ERR654964 ERR294781 ERR459750 ERR525253 SRR760660 ERR537000 SRR1779500
SRR1505008 SRR222179 SRR1784328 ERR189726 SRR1057937 SRR1639081 DRR016104
ERR204136 SRR459840 ERR298096 SRR453022 SRR499672 SRR1736308 ERR860995
SRR1596105 SRR1150057 SRR1267422 SRR1976228 SRR513573 ERR483970 ERR022513
SRR572400 SRR1747969 ERR343852 SRR1041796 ERR374891 ERR473302 ERR234445
SRR1228420 ERR314100 SRR828700 SRR346537 SRR1533592 SRR745157 SRR908477
SRR1221623 SRR1665132 ERR326485 SRR960423 ERR134342 SRR975346 SRR1955921
SRR1575577 ERR152205 ERR577918 DRR014315 SRR072398 ERR350100 SRR408542
SRR956497 SRR1207071 SRR444594 SRR569325 SRR023796 SRR445756 SRR1968955
SRR527252 SRR2017382 SRR931939 ERR279300 SRR493640 SRR396647 ERR699946
SRR1270652 ERR494832 SRR061604 SRR1969776 SRR1581498 SRR926181 SRR1725615
SRR248515 ERR765601 SRR748895 ERR085857 SRR1106146 ERR371809 SRR955100
SRR768678 SRR1219005 SRR1917500 SRR1049500 SRR1019215 SRR1187296 SRR352727
SRR873901 SRR137117 SRR540023 SRR287700 ERR085165 ERR176586 SRR1971600
SRR1422101 SRR633716 SRR517910 SRR350605 SRR1223216 SRR1570757 SRR965204
SRR1050341 SRR1999800 ERR017800 SRR039941 ERR221600 SRR567548 SRR516811
ERR470257 SRR1950901 SRR1980975 SRR857300 SRR1212577 ERR554958 SRR2000000
ERR414801 SRR1107536 SRR1774102 ERR580973 SRR1248801 SRR1427191 SRR1523713
SRR387494 SRR577000 DRR024487 ERR410892 SRR1645600 SRR1425057 SRR346885
ERR119984 SRR1179186 SRR949893 ERR421267 ERR034143 ERR702809 SRR1608117
ERR573120 ERR563853 ERR376969 SRR2054738 SRR068408 ERR207815 ERR264091
SRR1304302 SRR1800828 ERR045735 SRR1048008 SRR1384775 SRR133789 SRR1664204
SRR064177 ERR190783 SRR1224941 SRR123281 SRR004612 ERR276220 SRR1208156
SRR1997829 ERR276967 SRR1724600 SRR1003148 SRR918200 SRR2033774 ERR244167
SRR1719202 ERR275200 SRR1449223 SRR1818375 SRR611222 SRR1965618 SRR561870
ERR460228 SRR1966046 ERR403387 SRR716576 SRR770080 SRR030604 SRR1920216
SRR1104044 ERR162451 SRR096409 ERR171286 SRR1048824 SRR006006 SRR1644544
ERR084700 SRR1552909 SRR1342330 ERR433853 SRR2016400 ERR063903 SRR620324
SRR1944109 ERR715728 ERR179757 DRR003364 SRR1038508 SRR330515 ERR670734
SRR2017847 ERR124217 SRR016779 SRR606812 SRR1182321 SRR1214404 SRR1148379

SRR1979176 SRR069604 ERR004086 ERR539755 SRR1800302 SRR315801 SRR1614315
ERR198708 ERR271217 ERR369613 ERR028100 ERR877654 SRR538800 ERR506961
SRR1801537 ERR108600 ERR469619 SRR1553722 SRR1224755 SRR1016300 SRR515278
ERR205918 SRR2119505 ERR302693 ERR068183 SRR498000 SRR609444 SRR049944
SRR1232240 SRR353952 ERR461708 ERR554138 SRR1585216 SRR714618 SRR173062
SRR2062105 SRR836351 SRR1395302 SRR1978694 SRR504200 SRR018123 SRR1061345
SRR1180925 SRR1300900 ERR063786 SRR1508494 SRR951824 SRR2040762 ERR355891
SRR466111 SRR535600 SRR640898 ERR007506 ERR350426 ERR410388 SRR307596
SRR786667 SRR1003640 SRR1758716 SRR1801317 SRR1567099 ERR662473 SRR099207
SRR1524304 ERR263691 ERR347800 SRR1012908 SRR1817637 SRR1041453 ERR458146
SRR1636537 SRR1700606 SRR1657583 SRR1181209 SRR1452630 SRR1753930
SRR1134205 SRR1010800 SRR785253 ERR238206 ERR591141 ERR789234 ERR144900
SRR1539819 SRR1730454 ERR158569 ERR449893 ERR260500 ERR051464 SRR1220285
ERR163030 ERR211049 SRR1060700 SRR1967855 SRR1190305 ERR564150 SRR2012398
SRR315351 SRR1560600 SRR1106828 SRR449529 SRR598827 SRR892134 SRR1694008
ERR248208 SRR1966855 SRR1633877 SRR1583668 SRR343459 ERR024211 SRR1521326
SRR407278 SRR1974100 SRR1187001 SRR422132 SRR606501 ERR434281 SRR1229724
SRR2101207 SRR957334 ERR377644 ERR049023 SRR1122142 ERR190946 ERR059358
SRR1731882 ERR315200 SRR090332 SRR1104730 SRR1692326 SRR059788 SRR039686
ERR496838 ERR228600 SRR292154 SRR1766416 ERR156501 ERR045052 SRR1224426
ERR324045 SRR287998 SRR1799567 SRR1017407 ERR318421 ERR216900 SRR924803
SRR1821300 ERR193027 SRR2057010 SRR011175 SRR1263017 SRR190315 ERR129300
SRR1186707 ERR554692 ERR591226 SRR1293147 SRR586270 SRR1025755 SRR654552
SRR999445 ERR460892 SRR2043266 ERR052170 SRR918000 SRR017529 SRR1914396
SRR1532844 SRR1182904 ERR279791 SRR649913 SRR1347544 ERR766367 ERR406400
ERR125908 SRR1272908 SRR1958149 SRR099102 SRR1321142 SRR1130477 SRR1640000
ERR119657 ERR182420 SRR826822 ERR431030 SRR1258655 SRR1048184 SRR1823701
SRR639247 SRR1693626 ERR319418 SRR935655 ERR026800 ERR339968 SRR017133
SRR069824 SRR572209 SRR535300 ERR230500 SRR558505 SRR606455 SRR633907
SRR1645322 ERR782300 ERR124359 SRR1103820 ERR551600 SRR1063289 ERR046753
ERR526807 SRR593309 SRR1513645 ERR392507 SRR427083 SRR642902 SRR901608
SRR1781668 SRR529974 SRR1033455 SRR1870995 SRR516947 SRR1214600 SRR831075
SRR1570107 SRR1259252 SRR785500 SRR2064107 ERR410688 SRR292862 ERR657646
ERR435490 ERR217292 SRR1824519 SRR135541 SRR335406 ERR205821 ERR505493
ERR066500 SRR1012000 SRR2100304 ERR171100 SRR1693995 ERR163928 SRR918100
ERR716001 SRR1230902 SRR1047563 SRR1800517 SRR1577793 SRR945066 SRR1021212
SRR2007814 SRR462617 ERR222562 SRR1218178 SRR1985970 ERR588534 SRR1158326
SRR1711800 ERR109472 SRR1106670 SRR1509822 ERR343349 ERR361337 SRR398301
SRR058689 SRR1709558 SRR1664787 SRR1405694 SRR1965089 SRR275159 ERR662363
ERR045900 SRR1422841 SRR826196 SRR1999090 SRR2100901 ERR045865 DRR018562
ERR181435 SRR1183500 SRR328390 ERR730611 ERR403400 SRR850557 ERR450603
SRR1162961 SRR488827 SRR1033693 ERR405502 SRR797065 SRR1970632 SRR1112044

ERR172200 ERR142500 SRR1582487 SRR1228300 ERR085000 ERR257461 ERR484174
ERR294388 SRR1988314 SRR1778000 ERR380559 ERR760889 SRR1640521 SRR353608
SRR346759 SRR488249 SRR1050200 SRR1002804 ERR352185 SRR1490811 ERR065953
SRR599345 SRR1575022 SRR1558740 SRR333067 SRR1292323 SRR620532 ERR158700
SRR1141125 SRR567477 ERR352510 SRR1150351 SRR404118 ERR067900 SRR393836
ERR183352 SRR1596330 SRR386204 SRR1501500 SRR089409 ERR718554 SRR1225183
SRR726234 ERR840800 SRR1378618 SRR177250 SRR960184 DRR015978 SRR1199473
ERR192035 SRR1828967 SRR1193794 ERR048100 SRR1189900 SRR1273151 SRR139222
ERR331400 SRR1041864 ERR054587 SRR1822289 DRR017766 SRR060016 SRR974889
ERR315646 SRR1811823 SRR642296 SRR1172146 ERR706867 ERR117561 ERR376112
ERR600474 ERR433698 ERR540454 ERR440528 ERR470743 ERR329997 SRR1016881
SRR975060 SRR824937 SRR972850 ERR086200 ERR162944 SRR1020650 SRR2054377
SRR958196 ERR232386 ERR176446 ERR569654 SRR1151901 ERR591968 SRR1795823
ERR459440 SRR018449 ERR212119 ERR279076 SRR000904 ERR006508 SRR1613913
SRR933501 ERR028400 ERR238027 ERR558137 SRR040821 SRR1263918 SRR1198921
SRR502887 SRR2124800 SRR1103484 ERR360497 ERR271513 SRR1909000 SRR728899
SRR1533832 SRR1803129 ERR434900 SRR1329283 ERR743915 SRR346600 ERR065287
SRR1028700 ERR363595 SRR794912 SRR1635530 SRR1960230 SRR1462316 SRR1161148
ERR765712 SRR1653564 SRR1367200 SRR1165663 SRR1754718 SRR1713500 SRR2049553
ERR125400 SRR988000 ERR660616 SRR1803829 ERR196540 SRR1518954 ERR164848
SRR2050311 SRR1576989 SRR1525788 SRR1955838 SRR1221507 SRR1005725 DRR002013
ERR653311 SRR037687 SRR1201007 SRR277688 SRR987018 SRR1561244 SRR2067476
SRR1423810 SRR069159 SRR1505359 SRR071758 SRR630077 ERR405854 SRR088942
ERR197600 SRR988538 SRR1571231 SRR393959 SRR1609700 ERR016700 SRR1124826
SRR1792900 SRR782086 ERR658487 SRR2048404 ERR485890 ERR175611 SRR1552590
SRR1151197 ERR347395 SRR2053310 SRR499418 SRR514278 SRR1238908 SRR950393
ERR237867 SRR1508894 SRR1219482 ERR190206 SRR1861570 SRR1797509 SRR022885
ERR349508 SRR513490 ERR110100 SRR1013451 SRR1185101 SRR1919349 SRR1336862
SRR835795 ERR302900 SRR1226995 SRR1617371 ERR374162 SRR1045025 SRR1208615
SRR1286104 SRR1167600 ERR318144 SRR1323999 SRR081500 ERR071082 SRR530478
ERR067576 SRR1575962 ERR024900 SRR1557865 ERR654800 SRR2033906 ERR351972
ERR051894 SRR946147 ERR249306 SRR630972 SRR715764 SRR1187423 ERR562348
SRR712782 SRR1587936 ERR573935 SRR2070860 SRR1785130 SRR1578500 SRR1646177
SRR1212304 SRR1995052 SRR1536433 ERR021951 ERR382021 ERR211305 SRR849485
SRR494765 SRR554097 ERR732826 ERR491000 SRR1147879 ERR386054 SRR1258173
SRR1265099 ERR557000 ERR033500 SRR867718 ERR469300 SRR399033 SRR2101728
ERR419191 ERR211443 SRR958832 SRR998592 SRR520470 ERR558040 ERR137782
SRR1760023 SRR1107841 ERR126000 SRR2120750 SRR1950882 SRR031372 SRR627554
SRR2002708 SRR519925 SRR1790776 SRR2100406 SRR1581134 SRR1334362 ERR072218
SRR1531001 ERR340094 ERR714781 SRR1382014 SRR1569901 SRR832995 ERR570726
SRR771360 ERR464793 SRR1393711 ERR504755 ERR182530 ERR360500 ERR018000
SRR2051280 SRR095662 SRR1216679 ERR031100 SRR710098 ERR310916 SRR656818

SRR1292421 SRR1221003 SRR1010997 SRR400501 SRR522905 SRR598767 SRR1654807
ERR467400 SRR445246 SRR494175 ERR340757 SRR2029070 ERR579921 SRR1393136
SRR1147579 ERR039258 SRR503621 SRR078835 SRR597053 ERR314275 ERR371737
ERR361914 SRR1996328 ERR129262 ERR111556 ERR163462 SRR1068557 ERR418530
ERR713236 ERR439931 SRR958612 ERR517400 ERR263738 SRR2047314 ERR490895
SRR036930 SRR1817255 SRR1655310 SRR1199311 SRR019214 SRR710515 SRR1736481
ERR600396 SRR1580920 ERR305491 SRR768446 ERR084492 SRR1566301 ERR715397
SRR1125002 SRR016387 ERR374558 ERR323219 SRR1196677 SRR1146267 SRR1693744
SRR1384851 SRR1952464 ERR359755 SRR1197224 ERR553202 ERR056482 SRR177300
SRR1172203 SRR516181 ERR904394 SRR070452 SRR926598 SRR1187742 ERR015600
ERR657174 ERR023600 ERR357473 ERR863043 ERR695585 ERR108039 ERR052900
SRR1024293 SRR027709 SRR1988215 ERR232281 SRR409152 ERR675135 SRR1574787
SRR955504 SRR1962339 ERR540537 SRR1454479 SRR064997 SRR2058404 ERR716934
SRR626616 SRR1303466 ERR334669 ERR667300 ERR386518 ERR029925 SRR133640
SRR1104102 ERR527300 SRR1737748 ERR213100 SRR1920199 SRR1510202 SRR554100
SRR1274975 SRR1023811 SRR010013 SRR453238 SRR1927281 SRR031803 SRR1961909
SRR1204002 ERR165919 SRR1910739 SRR363853 SRR1106560 SRR1215004 SRR1132821
SRR218500 SRR1788093 ERR086100 SRR1137233 SRR755156 SRR1163000 SRR1045950
ERR430998 ERR714182 SRR1285612 SRR1963100 SRR1687200 SRR1180032 SRR1161037
SRR1967055 SRR1071259 SRR333466 SRR066731 SRR941061 DRR014047 SRR328964
ERR726234 SRR212407 SRR1583085 SRR1257317 SRR1965506 SRR620425 SRR386886
ERR752509 ERR356237 SRR413297 SRR043094 ERR202386 SRR2038540 SRR1709107
SRR1159101 SRR405074 SRR122212 ERR439282 SRR1174759 SRR1173202 SRR592953
SRR1314502 ERR275181 SRR1776953 SRR1029088 ERR769122 ERR119519 SRR1967755
SRR891950 SRR496551 SRR447619 SRR1015610 SRR684488 ERR210969 SRR1576777
SRR1159908 SRR290516 SRR598041 SRR1587814 SRR043778 SRR1273200 SRR309273
ERR056900 SRR121583 SRR2015057 SRR1793705 ERR505366 SRR1038443 SRR1201258
SRR610700 SRR1726146 SRR583673 SRR1171953 SRR1177762 SRR363126 ERR133960
SRR1039666 SRR570184 SRR006330 SRR641952 ERR560499 SRR1971369 SRR1951833
SRR258832 SRR1582206 SRR1707501 SRR1519200 SRR583008 SRR1283219 SRR1379610
ERR470609 SRR032796 SRR1056322 ERR739056 ERR296599 SRR1240949 SRR1999998
SRR543402 ERR387380 SRR062638 SRR1218729 SRR1232847 ERR200367 SRR1805709
SRR917591 SRR1592202 ERR578133 SRR1217825 ERR164016 SRR1548400 SRR1177095
SRR956502 SRR116795 SRR1732675 SRR1025106 SRR051609 SRR1536772 SRR094139
SRR531818 SRR315547 SRR1164493 ERR326357 SRR1220358 SRR1019806 SRR1981427
SRR896530 SRR1969276 SRR518534 ERR142459 SRR097622 SRR684984 ERR109540
SRR715097 SRR1796042 ERR062284 ERR246817 ERR598471 SRR1508160 SRR1190235
SRR1188530 ERR233693 SRR1792201 SRR1755067 ERR572702 SRR307600 SRR1230221
ERR454500 SRR342413 SRR364475 SRR957245 ERR765586 ERR474500 SRR1795734
SRR1752900 ERR278514 SRR278559 SRR1709628 SRR1226068 SRR1700755 ERR234078
ERR449300 SRR925102 SRR960952 SRR895867 SRR1947852 SRR394952 ERR251870
SRR1964912 SRR447212 ERR593824 SRR1050681 ERR064448 ERR144685 ERR161062

SRR2069373 SRR1191546 SRR1481700 SRR1813751 SRR1122051 SRR1017581
SRR1190432 SRR1202700 SRR1160601 SRR1752099 SRR1025855 SRR633802 SRR521588
SRR597700 ERR332087 SRR1299400 SRR098032 SRR1918766 SRR390202 ERR164741
SRR1233002 SRR030777 ERR632959 SRR1618500 SRR1290758 SRR1741400 SRR446286
SRR1796936 SRR1631023 SRR065149 ERR903745 SRR940707 SRR1296562 SRR1699489
SRR1786094 ERR126106 ERR576950 SRR278620 SRR1588662 ERR042839 SRR605601
SRR2051524 SRR1744108 SRR024354 SRR1619600 SRR1646400 SRR528444 SRR100287
SRR1163511 ERR377509 ERR316926 ERR388300 SRR611378 ERR840700 ERR270614
ERR337983 SRR1522100 ERR204244 ERR731373 ERR713075 ERR369167 SRR1048234
ERR033069 SRR644813 ERR119758 ERR550790 SRR1965838 SRR1186667 SRR2037312
SRR863639 SRR118426 SRR1737027 SRR036365 SRR593400 ERR314556 ERR489744
SRR525283 ERR353007 SRR138218 ERR561684 DRR002276 SRR1535000 SRR329635
SRR211268 SRR032597 ERR886526 SRR1293408 SRR653597 ERR702707 SRR948358
ERR040075 SRR1582005 SRR572700 SRR1571498 SRR091829 SRR1508900 SRR1033501
SRR488159 SRR1230427 SRR1377302 SRR1021199 SRR1931702 SRR1999100 ERR473267
SRR2100102 ERR134230 SRR1019971 SRR1976074 SRR1570046 SRR1630903 ERR586851
SRR1509766 ERR107900 SRR1144668 ERR752308 SRR1565402 SRR1329306 ERR317528
SRR1871213 SRR1012300 ERR405672 SRR1659015 SRR499585 ERR376700 SRR527856
ERR105100 SRR1709400 SRR901700 SRR016401 SRR1004000 SRR2036124 SRR1021900
SRR776454 SRR1067634 ERR486827 ERR352275 ERR472734 SRR1923037 SRR2062904
SRR1106732 SRR647432 SRR944622 SRR516407 SRR530339 SRR1777706 SRR073132
ERR588011 SRR1270040 SRR950403 ERR152031 SRR1050173 SRR717626 ERR125100
ERR257373 SRR1583138 DRR022541 SRR1523535 SRR058720 SRR2064214 DRR018247
ERR596377 SRR567300 SRR1944528 ERR738799 SRR953482 ERR355980 SRR1001027
SRR1799258 SRR1463366 SRR857925 SRR1405703 SRR653402 SRR1971469 SRR850616
SRR1812918 SRR1112103 SRR941955 SRR1002700 SRR1269353 SRR1961019 ERR730793
SRR592259 SRR577215 ERR604982 SRR1636912 SRR333159 SRR1183400 SRR1033700
SRR1967955 SRR1636677 SRR1422901 SRR998863 ERR017598 DRR014735 SRR1288356
SRR1016922 SRR1017255 SRR2014679 ERR688912 ERR516390 SRR1427702 ERR257648
SRR870978 DRR018434 ERR335100 SRR1175500 SRR1734293 SRR1292600 SRR972700
SRR1655410 ERR008578 SRR1118207 SRR392260 ERR216899 SRR1130248 DRR017636
SRR1966755 ERR554719 SRR1001850 SRR599472 ERR211237 SRR1015704 SRR2025301
SRR539127 SRR475446 SRR1630792 ERR226326 SRR1656411 SRR1020507 ERR702696
ERR496935 SRR1556591 ERR067623 ERR109286 SRR1774077 SRR924907 SRR606600
ERR757315 SRR1269400 SRR1849233 SRR1513901 ERR315179 SRR1276145 SRR1974204
SRR1556625 SRR1224595 ERR066301 SRR023483 SRR500270 SRR1134395 SRR292277
ERR313113 SRR1981573 SRR387923 ERR018100 SRR713561 SRR1861636 SRR1796719
SRR067600 SRR957993 SRR1346300 SRR1195684 SRR2074923 ERR374249 ERR319505
ERR144489 SRR017408 ERR323100 ERR538405 ERR010476 SRR1726089 SRR004519
SRR1151807 SRR325168 SRR1823683 SRR1724178 ERR485708 ERR551743 SRR1056042
SRR1380973 SRR350199 SRR514008 ERR431103 ERR418456 ERR237991 ERR348423
SRR1145600 SRR1958800 SRR1140966 ERR191730 SRR1208031 SRR1962403 ERR406392

SRR1225973 SRR387635 SRR329388 SRR393019 SRR2053215 SRR765912 SRR768320
ERR634100 SRR060519 ERR338300 SRR944265 SRR2000236 ERR164900 SRR398246
SRR1645457 ERR124487 ERR375192 SRR1576000 ERR449456 SRR1544143 ERR144751
SRR2063840 SRR1910841 ERR409713 SRR515064 ERR212231 SRR1190182 SRR1817385
SRR1713616 SRR1582320 ERR051740 SRR1751233 SRR1560575 ERR357682 SRR1870884
SRR1781700 SRR1185820 SRR1003700 SRR1665052 SRR101435 ERR193117 SRR1041219
SRR491675 SRR486883 SRR1217215 SRR643200 ERR175560 SRR915748 ERR772254
SRR610047 SRR1371300 ERR461479 ERR410102 SRR507748 ERR137095 SRR860369
SRR1797429 SRR1619348 SRR636585 SRR1791591 SRR1300429 SRR1237867 SRR1219130
SRR351322 ERR658389 ERR435300 SRR1212264 SRR711400 ERR313023 SRR002259
ERR217300 SRR099031 SRR1373603 SRR1658100 ERR054222 ERR661284 SRR696127
SRR1700558 SRR1146982 SRR514122 ERR115100 ERR127000 SRR598936 SRR1561384
SRR449302 SRR1588362 SRR1221419 SRR069093 SRR022707 SRR020800 ERR326200
SRR1589703 SRR1208709 SRR849599 SRR928248 SRR1210826 SRR712890 SRR2047824
SRR1215533 SRR1511615 SRR1226872 ERR029239 SRR218398 SRR1055741 SRR2048380
ERR591394 SRR498276 ERR159931 ERR190134 SRR630840 SRR208051 SRR1811700
SRR608943 SRR1792855 SRR1646200 SRR475256 ERR171072 SRR2070968 SRR361849
SRR799085 SRR1752604 SRR1267253 SRR279125 SRR546446 SRR032219 SRR1010727
SRR712052 SRR672416 SRR785406 SRR769471 SRR609135 ERR158802 SRR089343
SRR715896 ERR438800 ERR161154 ERR358000 ERR674989 SRR1167570 SRR769360
ERR791710 ERR235300 DRR000001 SRR029351 SRR1187576 SRR2015917 SRR1170901
ERR022312 SRR023905 ERR054635 ERR294288 SRR724499 SRR1736514 SRR1218941
ERR107522 SRR1232573 SRR1619532 DRR001004 SRR726548 SRR2015351 ERR573095
SRR642152 SRR1146005 SRR031268 SRR067466 SRR1966250 ERR701924 SRR1779340
ERR023800 SRR136804 SRR960200 ERR363453 ERR221800 ERR135686 SRR1525661
ERR863838 SRR027565 SRR1165509 ERR117600 SRR1172405 ERR125028 ERR654297
SRR1634776 ERR234741 SRR107651 SRR1806903 ERR894411 SRR1216502 SRR341227
SRR1765663 ERR340199 SRR1130349 ERR654000 SRR1150207 ERR238103 SRR1693843
SRR1792106 ERR212365 SRR1753647 SRR345545 SRR427112 ERR459530 SRR1462205
SRR1330400 SRR712959 SRR493898 SRR172652 ERR216000 SRR1802691 ERR352660
SRR1635675 SRR1969976 SRR400624 ERR196664 SRR1259108 ERR424992 ERR703000
SRR1193825 SRR642803 SRR974942 SRR892468 SRR360675 SRR395001 ERR052272
SRR941213 SRR924213 SRR1554505 DRR015878 SRR1258558 ERR048089 SRR227300
SRR404252 ERR374685 ERR755735 SRR1622983 SRR346329 SRR533973 SRR1952270
SRR1805454 SRR784400 SRR1532706 SRR1968155 SRR1999222 SRR1205846 SRR502988
ERR593935 SRR1166700 SRR1196503 ERR086056 ERR716157 SRR071696 SRR1036992
ERR349463 SRR2056400 SRR1952508 ERR676600 SRR065294 ERR739199 ERR657021
SRR1038036 SRR654065 SRR1796102 SRR562005 ERR031661 SRR1522753 ERR030100
SRR931853 SRR639911 SRR1691182 SRR1151096 ERR582672 SRR638917 SRR1574877
SRR1231431 SRR901400 SRR1916100 SRR755222 SRR1819800 SRR2024964 DRR006509
ERR226071 SRR1631736 SRR070705 ERR695648 SRR023194 SRR652400 ERR314395
ERR026900 SRR1160529 SRR1577629 SRR1227431 SRR504067 SRR851000 SRR1745317

ERR369043 DRR014192 ERR901526 ERR708464 SRR1220025 SRR326263 SRR409942
ERR015599 SRR955422 ERR025800 SRR341926 SRR567996 SRR2075407 SRR1740397
ERR072049 SRR681700 SRR1020876 SRR2080778 SRR1979315 DRR014834 ERR040144
ERR375088 SRR1221140 SRR189437 ERR388426 SRR1058062 SRR1016600 SRR1047007
SRR1525566 SRR605746 DRR017980 SRR554289 ERR191689 ERR531408 SRR1266877
SRR1183301 SRR2077257 ERR744221 SRR058897 SRR1582135 SRR945146 SRR000066
SRR531231 ERR439156 SRR1793658 SRR094700 SRR156326 SRR1664400 SRR1687183
SRR1927110 ERR550405 SRR090240 SRR1608924 SRR2078825 SRR1384909 SRR1963066
SRR1257473 SRR1169009 ERR420094 SRR359043 DRR002132 ERR425578 ERR411096
SRR512583 DRR021339 SRR1024182 SRR1284628 ERR594075 ERR277000 ERR690486
SRR1314700 SRR941832 SRR943364 SRR943767 ERR861945 ERR466548 SRR1366163
SRR1039476 ERR484442 SRR1794441 SRR542324 ERR097313 SRR1818128 SRR2012419
SRR349799 SRR1191488 SRR1003868 ERR330000 SRR736004 SRR1363502 SRR1229299
SRR1732010 SRR714871 SRR958710 ERR430625 SRR1030807 ERR667243 ERR162600
ERR051600 SRR1248000 ERR419974 ERR593141 ERR570400 ERR302800 SRR494264
ERR388900 SRR1870108 SRR2038443 ERR469282 SRR826200 SRR2057221 ERR340801
SRR958963 SRR2043500 SRR447190 SRR1178517 SRR445159 SRR1986378 SRR036120
SRR1043860 SRR1554404 SRR1995840 SRR074945 SRR1393236 SRR074242 SRR084746
SRR1654950 ERR486128 ERR068300 ERR553097 SRR2058336 SRR1346247 SRR307784
ERR715212 ERR213027 ERR072100 SRR1960102 ERR321059 SRR847598 SRR2010299
SRR1024300 ERR713355 SRR797504 SRR764675 ERR305503 SRR426833 ERR017975
SRR1393809 ERR375366 SRR1748403 SRR1179907 SRR2101801 ERR178551 SRR1950133
ERR028300 SRR949275 ERR731026 ERR163300 SRR867693 SRR1922550 ERR670500
SRR1232071 SRR1230305 SRR1148579 SRR1010632 ERR876019 ERR490934 SRR364522
SRR770450 SRR1157834 SRR1686734 SRR1097801 SRR1103500 SRR326953 SRR1051091
ERR713844 ERR688008 SRR1566247 ERR129100 SRR1801761 ERR749100 ERR356819
ERR161879 ERR234919 SRR631322 SRR1732574 SRR1560245 ERR227019 SRR1153339
ERR903695 SRR374364 SRR922489 ERR653270 SRR1980037 ERR737347 SRR327026
ERR366407 SRR1957747 ERR039477 ERR084561 SRR830470 ERR325400 ERR256941
ERR279501 SRR231808 SRR1050515 SRR1947775 SRR834917 SRR1685369 ERR023500
SRR1145737 ERR042200 SRR2076000 SRR909737 ERR038649 SRR1272897 SRR921503
ERR353350 SRR895988 SRR1916804 ERR119420 SRR1573551 ERR758631 SRR946461
SRR1959717 ERR047936 ERR579114 SRR1248931 SRR390316 SRR1274800 SRR1025902
SRR1299397 SRR1996214 SRR1820091 SRR1618496 ERR123904 SRR036874 SRR292342
SRR1752100 ERR256831 ERR730410 SRR1613889 SRR1643164 ERR225607 ERR540702
SRR1586053 ERR111454 SRR1293379 SRR1163474 SRR1014692 ERR634096 SRR496997
SRR1515947 SRR534491 SRR1522064 SRR2066774 SRR1012200 SRR039733 SRR1173800
ERR713107 SRR2051435 ERR114492 ERR271088 SRR353761 SRR528146 ERR251752
SRR1798561 SRR1167000 SRR1049700 SRR2048636 SRR1143300 SRR497015 SRR2037218
ERR033100 SRR148713 ERR331185 SRR1054117 SRR940275 SRR1101501 SRR1163177
SRR1986522 SRR952344 SRR286682 SRR1698180 SRR066603 SRR1956848 ERR271764
ERR493470 ERR439300 SRR1166600 SRR617425 ERR656315 SRR959153 SRR1174881

ERR434892 ERR109642 SRR576621 ERR185998 ERR926626 SRR1982010 SRR1159064
SRR495102 SRR1144768 SRR218498 SRR036203 SRR116812 SRR077497 ERR494617
SRR1981946 SRR1799420 SRR1709055 SRR1182463 SRR1200749 SRR096084 SRR1951985
SRR961989 SRR1798600 ERR418393 SRR005736 ERR126900 ERR197195 SRR651738
SRR546301 ERR419283 SRR1973900 SRR1314607 SRR2068008 SRR139099 SRR1201362
SRR006465 SRR1217782 ERR689069 SRR749060 SRR1931171 ERR387459 SRR1998936
SRR072400 SRR020179 SRR772340 SRR1105663 ERR142311 ERR453458 SRR1039781
SRR1975190 SRR1166082 SRR2066432 SRR1988186 ERR039363 SRR1508248 ERR228121
SRR1226754 SRR1640316 SRR340006 ERR246900 ERR516407 SRR896362 SRR639118
ERR743266 SRR1871338 SRR358953 SRR1929654 SRR896434 SRR1639590 ERR572847
SRR1147979 SRR787434 SRR715100 SRR786007 SRR917600 SRR441575 SRR490124
SRR041663 SRR522873 SRR1233849 SRR1159800 SRR1147679 SRR342352 SRR1295572
ERR200267 SRR1533150 SRR1175455 ERR657992 ERR233700 SRR599564 ERR692072
ERR044160 SRR1171100 ERR023300 ERR298356 ERR579313 SRR315790 SRR892501
SRR826782 SRR1849304 SRR612119 ERR068083 ERR434788 SRR729310 SRR956873
SRR726438 DRR031997 SRR1238791 ERR436391 SRR346405 SRR184513 SRR643873
SRR2015800 SRR1633500 ERR271337 SRR015696 SRR107718 ERR054357 SRR651301
SRR067501 SRR1966148 SRR436900 ERR671908 SRR785017 ERR570058 ERR433427
SRR1021459 SRR404304 SRR1165892 SRR1757502 SRR1264545 SRR900925 ERR181676
ERR197400 SRR1232605 SRR1481630 SRR316685 SRR493284 ERR015950 SRR060847
SRR1501700 ERR059957 ERR586698 ERR498072 SRR029606 SRR1258435 ERR164645
SRR1302896 SRR1145991 ERR245836 SRR768247 SRR974686 ERR739200 SRR013340
SRR1285991 SRR081481 SRR1151300 ERR140832 SRR1258881 SRR1165299 SRR882110
ERR352341 SRR064213 ERR697100 SRR958325 ERR234214 SRR1636038 SRR1205788
SRR953226 SRR339983 SRR642344 SRR517591 ERR470539 SRR652139 SRR988425
SRR1190026 ERR176046 SRR1923640 SRR1552349 SRR1239108 ERR118538 SRR1200251
SRR2039654 SRR638039 ERR765900 ERR114965 ERR346710 ERR583404 ERR658229
SRR1049140 SRR033887 SRR317498 ERR142610 SRR1999316 SRR2100208 SRR070852
ERR222800 SRR1967155 SRR1968455 SRR1185301 SRR961681 SRR769955 ERR925900
ERR495240 ERR278300 SRR1149980 ERR347529 ERR029300 SRR1161301 SRR518759
ERR360629 SRR350073 SRR946304 SRR1960087 SRR1792384 SRR1965726 SRR866921
ERR190500 ERR022119 SRR1609067 SRR1995500 SRR504828 SRR201790 SRR1407786
SRR073220 SRR578765 ERR048500 SRR1166949 SRR797242 ERR588858 SRR1736253
SRR550171 ERR175848 SRR2047518 DRR015577 ERR137982 SRR1725170 ERR045185
ERR316300 SRR849601 ERR842307 ERR473802 ERR374368 ERR566631 SRR1186517
SRR1922806 SRR1525006 SRR1068300 SRR1167800 SRR400040 SRR1218829 ERR388700
SRR2080386 SRR1174245 ERR046059 ERR193281 SRR124112 SRR935872 SRR2075100
SRR1660283 SRR022646 SRR1371021 ERR484079 SRR1225397 ERR829321 SRR515625
SRR2001634 SRR1017300 ERR363315 SRR413932 ERR024700 SRR671869 SRR062543
SRR609202 SRR035431 ERR304826 ERR135800 ERR046159 SRR1185425 SRR765100
SRR1148179 SRR1103275 ERR067786 SRR2015204 DRR016446 ERR494521 ERR028600
ERR048600 SRR1636700 ERR552041 ERR505956 ERR273820 ERR279209 ERR730182

ERR868558 ERR120028 SRR090600 ERR038300 SRR152353 SRR1587772 SRR500471
ERR303233 SRR786949 ERR653156 SRR935472 ERR369938 SRR599118 SRR1722867
SRR748508 SRR353400 ERR551410 ERR341259 SRR631071 SRR1048301 SRR1686039
SRR106820 ERR448800 ERR431231 SRR1779408 SRR1973599 SRR940341 SRR1103669
SRR1449671 SRR954505 SRR1821276 SRR863372 SRR1818276 SRR1146329 SRR1951504
SRR1425958 SRR2101009 ERR008613 SRR1249000 SRR957820 ERR257598 SRR1544064
ERR757215 ERR472988 SRR619318 SRR1655910 SRR391021 ERR601537 ERR460653
SRR1183745 SRR1630825 ERR030000 SRR495601 SRR1562592 SRR1029539 SRR1720556
DRR000841 ERR689490 SRR2044915 ERR578033 SRR1157585 SRR1329807 SRR2029583
SRR2045883 SRR030252 SRR713497 SRR2032525 SRR833196 SRR1959120 SRR096812
SRR402738 ERR319231 ERR170850 SRR1602500 SRR010961 SRR1753747 ERR505290
SRR1272766 SRR1367198 SRR1810848 SRR1262380 SRR916075 SRR1645183 ERR108380
SRR017708 SRR1761796 ERR376806 SRR1106400 SRR873847 DRR030767 ERR694494
ERR005143 ERR104658 ERR411292 SRR198001 SRR957171 SRR1614814 SRR1307721
ERR636248 SRR333561 SRR1960902 SRR1710100 SRR017355 SRR1534900 SRR1451242
ERR226200 DRR018794 SRR1062900 SRR1609993 SRR360471 ERR144578 ERR541047
ERR439745 ERR592101 ERR486544 SRR631732 SRR2050938 ERR388280 ERR212875
SRR065616 SRR1993644 SRR535700 SRR1544281 SRR059040 SRR1015203 SRR1422648
SRR1291412 ERR334499 SRR1762624 ERR662800 SRR678033 SRR899426 ERR473149
SRR1261336 SRR1289659 SRR2100703 ERR863224 SRR1582674 DRR003192 SRR516354
ERR237600 SRR1163301 SRR489154 SRR004468 SRR1010424 SRR1523275 SRR1019709
SRR1870756 ERR526292 SRR534500 SRR846967 SRR1214755 ERR716209 SRR1571579
ERR119082 SRR1212190 SRR1180202 ERR171821 SRR386900 ERR419600 SRR1025515
SRR1738016 ERR326136 SRR1267901 SRR527733 ERR551063 SRR1215601 SRR999644
ERR266408 SRR1206476 SRR1966450 ERR217403 ERR163730 ERR599398 SRR351245
SRR900440 ERR704371 DRR030443 SRR1220136 SRR067798 ERR361821 SRR1819749
ERR450419 SRR1015465 SRR1270100 SRR2035385 SRR784102 SRR1270858 ERR064155
ERR629092 SRR1658081 SRR1799133 ERR032135 SRR1724211 ERR554480 SRR1555352
SRR850728 ERR375854 SRR1554258 SRR1709345 ERR414089 ERR706104 SRR621986
SRR352314 SRR610904 ERR632862 SRR1439619 SRR498188 SRR1965200 SRR1219962
SRR1523196 SRR1576123 SRR1566600 ERR434061 ERR109300 SRR496386 SRR839221
SRR932000 SRR972394 ERR158979 SRR1148879 ERR172493 SRR1800004 SRR1801934
SRR1607290 SRR1001700 SRR1584520 SRR364360 SRR567298 SRR1943299 ERR050016
ERR107871 SRR927595 ERR585845 SRR457288 SRR2054121 ERR586367 ERR228428
SRR447490 SRR969033 SRR1791764 ERR593200 SRR1754165 SRR1958456 SRR835910
SRR1948177 SRR1765575 SRR1587600 SRR1175004 SRR1612626 SRR1324585 SRR122384
SRR825577 SRR1632877 SRR1685900 ERR156437 ERR505800 SRR1592400 SRR1146469
SRR2067916 SRR180576 SRR1792484 SRR1227551 SRR1769027 SRR1229381 ERR525300
SRR1287824 SRR125401 SRR1781586 SRR2075771 SRR1695486 SRR005656 ERR348900
SRR537020 SRR1137821 ERR527219 SRR1793520 SRR043200 ERR137275 SRR1945089
ERR664778 SRR1533624 ERR196747 SRR989790 ERR554502 SRR801800 SRR385953
ERR577854 SRR1003320 SRR1169872 SRR1524955 SRR522154 SRR1410038 ERR060234

SRR1618349 SRR1708046 SRR364078 ERR490744 ERR350075 SRR1030609 ERR055714
SRR1340400 SRR1188339 SRR896246 ERR228212 SRR1524044 SRR1177285 SRR345600
ERR108275 SRR278164 SRR1505237 SRR1519879 ERR246661 ERR461347 SRR1239340
SRR094442 ERR387554 SRR1225402 ERR047892 ERR064200 ERR097413 SRR1060494
SRR1299215 SRR1955607 ERR316650 SRR656741 SRR1217003 SRR1328290 SRR1148779
SRR959022 SRR1177900 SRR390431 SRR1768424 SRR031126 SRR951542 SRR1981612
SRR114862 ERR730819 SRR1981222 ERR226150 SRR019008 SRR1631654 SRR028684
SRR641386 SRR314729 SRR1141652 SRR1014498 DRR023946 SRR1049822 SRR020200
SRR1707090 SRR1769749 ERR450284 ERR449514 SRR036709 SRR1013600 SRR1573222
SRR332555 SRR1637012 SRR1752738 ERR550500 SRR1522331 SRR639454 SRR040410
SRR1141238 SRR932182 SRR1567873 ERR403700 SRR1461909 ERR903360 SRR922307
ERR369342 ERR502400 SRR1640221 SRR490938 SRR1965192 SRR2080622 ERR886072
SRR681624 SRR1214005 SRR1201809 SRR1655810 ERR349342 SRR1290900 SRR1918944
ERR233875 ERR042137 SRR1592124 SRR1481922 ERR297100 SRR1963604 ERR538090
SRR388699 SRR599800 SRR1329973 SRR016114 SRR571158 SRR1029664 ERR406247
SRR1696960 ERR662796 ERR103394 ERR025600 ERR493843 SRR1514807 ERR071988
SRR1745475 SRR1219642 SRR891709 SRR713315 ERR191800 ERR024000 SRR2077386
SRR909270 SRR1202980 ERR036340 ERR026000 ERR594183 ERR712636 SRR2012765
ERR019400 ERR142104 SRR1218553 ERR714980 SRR389089 SRR1236349 SRR1714116
SRR305194 SRR953842 ERR599874 SRR1233257 SRR1174940 SRR1509569 ERR474040
SRR020045 SRR1569686 SRR1786283 ERR673678 SRR1334555 SRR1586544 SRR1735266
SRR1535658 SRR1208412 SRR059930 SRR359304 ERR377354 ERR439096 ERR543957
SRR628695 SRR2072483 SRR1229962 ERR126612 DRR000564 SRR1763625 SRR190219
SRR714251 SRR1222753 SRR036015 DRR023000 SRR098973 SRR2005734 SRR2040142
ERR688655 SRR1967255 SRR1302798 SRR1011990 SRR1956760 SRR2024476 ERR196387
SRR1786972 SRR709476 SRR1693400 SRR1393336 ERR340492 ERR583541 SRR1657607
SRR1266702 ERR911919 SRR535100 SRR672720 SRR142700 SRR1207526 SRR1170779
SRR1165909 SRR847600 SRR1035128 SRR445017 SRR747871 ERR212905 ERR233160
SRR1149832 SRR622460 SRR647343 SRR1284786 SRR764543 ERR211699 SRR1618830
SRR1296010 SRR039400 SRR948573 SRR447002 ERR666954 ERR057800 SRR1324761
SRR1806277 SRR2000327 SRR496890 ERR318504 SRR070319 SRR1552084 DRR008448
SRR1732239 SRR1597500 SRR155596 SRR520228 SRR1181540 SRR1801275 SRR090575
SRR074870 SRR1147779 SRR074108 SRR097473 SRR1203043 ERR134801 ERR744312
SRR071903 SRR407381 SRR329496 SRR1363497 SRR2059984 SRR641278 ERR592673
ERR670492 DRR013332 SRR1056127 SRR563448 SRR915674 ERR600539 SRR845772
SRR497559 SRR1702362 SRR1995737 SRR1988400 ERR016900 SRR034201 SRR398192
ERR148817 ERR152374 ERR517306 ERR163138 ERR713449 ERR418785 ERR715801
ERR778722 SRR191830 SRR1980730 ERR553806 SRR650219 ERR019800 ERR466207
SRR1049496 ERR357909 SRR256390 ERR083915 SRR463293 ERR676583 SRR1687071
SRR068600 SRR1107610 SRR389790 SRR2064653 SRR709926 SRR1959470 SRR1158110
SRR1122600 SRR494492 SRR1961727 SRR1375000 ERR218154 ERR501544 SRR828415
SRR1166100 SRR212957 ERR212003 ERR351319 SRR1217304 SRR203478 SRR931700

ERR323033 ERR129855 ERR005824 SRR1172020 ERR718465 ERR536984 SRR927400
SRR1955500 SRR331230 SRR638895 SRR1996134 ERR314415 SRR1047600 ERR017200
SRR1259680 SRR1653356 SRR1196466 ERR498136 SRR962010 ERR496647 SRR1209393
SRR1560091 ERR023400 ERR519785 SRR1090978 SRR189247 SRR1344835 ERR133682
SRR770134 SRR868754 SRR1615100 ERR587446 ERR563964 SRR652067 SRR1030347
SRR952664 SRR1702755 SRR1708905 SRR592715 ERR658903 ERR125209 SRR1927080
SRR1196906 SRR2039700 ERR540368 SRR1303627 SRR1790463 ERR485900 SRR1168525
SRR1303924 ERR460163 SRR1067910 SRR1598800 SRR1449919 SRR1593261 SRR534850
SRR1583516 SRR1754807 SRR000197 SRR1735365 ERR714384 SRR1297006 SRR1634664
SRR1223512 SRR611410 SRR955202 ERR162597 ERR192233 SRR096322 ERR226405
SRR1374952 SRR1216455 SRR646513 SRR1048900 ERR374024 SRR1705587 SRR1979446
SRR922251 SRR1664191 ERR657408 SRR149194 SRR248044 ERR161537 ERR380602
SRR489291 SRR1101443 SRR2062051 ERR885638 SRR2009585 ERR718348 SRR037144
SRR057353 ERR400500 SRR849709 SRR1557000 SRR1968355 ERR376696 SRR1290862
ERR435568 ERR347429 SRR969355 SRR253093 ERR063641 ERR915364 SRR1649517
SRR513132 SRR866839 SRR1197644 ERR458470 SRR1161212 ERR410760 ERR231645
SRR1042833 SRR504905 ERR388848 ERR899729 SRR568100 ERR636419 SRR1571600
ERR473759 SRR400848 SRR1588570 SRR1185098 ERR190411 SRR1561162 ERR175741
ERR196191 ERR048471 SRR630100 ERR632226 ERR222795 SRR643008 SRR1013527
ERR374400 ERR190331 SRR1165100 ERR471310 SRR784212 ERR497024 SRR554305
ERR588700 SRR1995498 SRR136784 SRR671769 SRR1802858 SRR1165093 SRR403876
SRR728902 ERR015803 SRR1963500 ERR793242 SRR1648457 SRR1706186 ERR028500
SRR1720446 ERR316257 ERR654488 ERR038400 SRR1041118 SRR022554 ERR024800
ERR760715 SRR1635069 SRR1164600 SRR801638 ERR193300 ERR266553 ERR349236
SRR005032 SRR400902 SRR1449535 SRR785622 SRR960868 SRR353559 ERR731222
SRR1207440 SRR1167798 SRR1557947 SRR1103366 ERR219200 ERR135722 SRR1982200
SRR1185592 SRR1970559 SRR1523343 SRR900716 SRR341431 ERR701619 SRR515552
SRR024048 SRR772254 ERR294400 ERR637401 ERR036497 ERR029449 SRR1988500
ERR382121 ERR732900 SRR1634576 SRR873632 SRR1403641 SRR388324 ERR274125
ERR245091 SRR1797604 ERR784389 SRR1304634 ERR044200 SRR1763864 SRR1149679
SRR493107 SRR2077404 ERR056688 SRR000207 ERR708690 SRR1048423 SRR835423
SRR1301040 SRR1695602 ERR363900 SRR1915424 SRR1238800 ERR376090 SRR404401
ERR271419 SRR1183601 SRR1104963 SRR222576 SRR1328170 SRR1795507 ERR238745
SRR097259 SRR389110 SRR677780 SRR825613 SRR959374 SRR1929821 SRR1554382
ERR580459 SRR1049240 ERR046952 SRR1805600 ERR110798 SRR1592312 SRR988668
SRR1003900 ERR485000 SRR1177887 SRR1020000 SRR1169576 SRR1258339 SRR1151271
ERR586500 SRR210778 SRR1165788 SRR1212970 ERR134700 SRR1012129 SRR974700
SRR065000 SRR1124794 SRR029579 SRR638740 ERR352476 SRR957041 SRR1010521
SRR931685 SRR1169325 ERR697253 ERR346691 SRR650460 SRR223485 SRR139110
SRR1822600 SRR1225229 SRR1642937 ERR406977 SRR2073244 SRR611611 SRR015700
ERR330694 SRR317502 ERR054409 SRR644306 SRR1811566 ERR148286 ERR019700
SRR518692 ERR305882 ERR052000 ERR197582 SRR1162364 SRR797189 DRR003209

ERR171901 SRR1614074 SRR1777993 ERR702412 SRR2100802 SRR1505404 SRR1958656
SRR949994 ERR419784 SRR1871413 SRR1204789 SRR609896 SRR004368 SRR926600
ERR026791 ERR662294 ERR070054 SRR1177129 SRR550209 ERR233913 ERR131800
ERR031053 SRR918600 SRR1917104 DRR006271 SRR1424842 ERR054970 SRR811935
SRR1552456 SRR1184701 SRR585694 SRR1174150 SRR1179210 SRR124277 SRR488352
SRR217372 SRR1340396 DRR014528 SRR1215300 ERR085402 SRR1810035 SRR1596495
SRR851825 SRR1015315 SRR899517 ERR222631 ERR343431 ERR352061 ERR551178
SRR2062770 SRR446554 SRR1025678 ERR311529 SRR1214863 SRR342224 ERR170970
SRR530182 ERR484994 ERR584380 SRR654200 ERR107785 SRR1425835 ERR249213
SRR1616068 ERR361029 ERR758379 SRR1966350 ERR570162 SRR1908924 SRR1186465
SRR850805 ERR738800 SRR059811 SRR076007 SRR1958048 SRR392454 SRR049100
SRR394143 SRR1519074 ERR062874 SRR189086 SRR935905 SRR1148079 ERR257880
ERR059720 SRR1562600 ERR732667 SRR486157 SRR030385 SRR2032826 SRR891810
SRR1230626 SRR1017057 ERR360757 SRR090460 SRR1001694 SRR1664685 ERR237704
SRR1172809 SRR950662 SRR058081 ERR333865 SRR1685861 ERR017300 SRR1923100
SRR147300 SRR018971 SRR1293629 SRR1798101 ERR387074 SRR1656311 ERR199994
SRR2054241 SRR1211748 ERR190807 SRR1745270 SRR1960810 SRR1916072 SRR857263
SRR906357 SRR1722712 SRR649827 SRR1503355 ERR431374 SRR1728720 SRR863221
SRR1709262 SRR489378 SRR954404 ERR484219 SRR498442 SRR785913 ERR369832
ERR901478 SRR599220 ERR551505 ERR063500 SRR2002633 ERR477376 SRR949448
ERR601629 DRR017885 SRR017249 SRR981225 SRR157506 ERR467107 SRR1720753
ERR505767 SRR1609856 SRR1103701 SRR386033 SRR1286744 SRR765065 ERR331391
SRR2007326 SRR947237 ERR044937 SRR933401 SRR1531102 ERR450523 SRR1009263
SRR1784622 SRR2043367 SRR065715 SRR1636881 SRR1274789 SRR1657101 SRR580583
SRR606318 SRR688107 SRR1645200 SRR1810501 SRR137200 DRR003900 SRR1424581
SRR1544333 SRR343085 ERR486687 SRR1158200 SRR058935 SRR1553345 ERR653981
SRR1761800 SRR125284 ERR925895 SRR1966955 SRR1914400 SRR528760 ERR046800
SRR1973617 SRR308181 SRR1209435 ERR319337 SRR1534814 SRR799785 SRR1586195
SRR018585 SRR1408840 SRR1050034 ERR043300 ERR448767 SRR1145886 SRR957726
SRR500035 SRR1181644 SRR1191024 SRR1710077 SRR1732701 ERR027000 SRR1159302
SRR053435 SRR1291031 SRR066805 SRR1411121 ERR129732 SRR639309 ERR687900
SRR017677 SRR1288442 SRR314665 ERR449667 SRR496760 ERR042039 ERR299300
ERR351600 SRR1005674 SRR534288 SRR1460677 SRR1707134 SRR561910 SRR852399
SRR019175 ERR278683 ERR782296 SRR1292900 SRR329936 ERR118613 SRR1049958
SRR392565 SRR530264 ERR777032 SRR1553264 ERR368929 ERR025500 SRR096959
ERR103415 ERR251910 SRR830285 SRR1740549 SRR1769867 SRR350335 SRR1182712
SRR599912 SRR1066876 SRR1974010 SRR231653 SRR1163200 ERR524942 ERR234130
SRR609002 SRR1761524 SRR1959502 ERR562804 SRR1962284 SRR1296680 SRR958003
SRR1573332 ERR863169 ERR594200 SRR1509668 SRR1014500 ERR311600 SRR616246
SRR592829 ERR585780 ERR845240 SRR495433 SRR157498 SRR1101346 SRR1558995
ERR386622 SRR833795 SRR519762 ERR227503 SRR1593934 SRR039560 SRR1569700
SRR961870 SRR1140625 SRR1586221 ERR540273 SRR653721 SRR2057775 SRR2029709

SRR1287230 SRR1236421 SRR1334480 SRR1514988 DRR002764 SRR714175 SRR441714
ERR226500 SRR1744000 SRR653600 ERR840658 SRR032419 ERR502348 ERR126597
SRR909114 SRR948442 SRR2024380 ERR527404 ERR024500 SRR1528925 SRR1122964
SRR576933 SRR1535710 ERR524898 SRR1767783 SRR2014397 SRR1371294 ERR433528
SRR792571 SRR391678 SRR1159200 ERR181759 SRR2071001 SRR1166824 ERR022845
SRR034317 SRR071140 SRR1046302 SRR1144554 SRR2071968 SRR1011815 SRR1569800
SRR1334629 ERR264425 SRR784311 SRR953900 SRR1981300 SRR593200 SRR231104
SRR031076 DRR021932 SRR1167245 ERR714056 SRR043168 ERR387600 SRR413855
ERR736754 SRR1958796 ERR131796 ERR156300 SRR1171871 SRR1189807 SRR386700
SRR1948052 ERR716361 ERR712966 SRR833232 SRR940498 SRR494957 ERR532261
SRR334177 SRR1695593 SRR1122500 SRR1633229 ERR084300 SRR629551 ERR108154
SRR049240 ERR037234 ERR496738 ERR022075 SRR1559006 SRR1802918 SRR1170834
SRR1137734 SRR032607 SRR1148679 SRR1566177 SRR1214133 SRR1043195 SRR1653464
SRR1633488 ERR316743 ERR411336 ERR117471 SRR1501253 ERR246742 SRR2098944
SRR029823 ERR325380 ERR572625 SRR1817192 ERR016800 SRR1162417 SRR2047253
SRR1572825 SRR116665 SRR960011 ERR730957 SRR925301 ERR576130 SRR1299110
SRR1145126 ERR196251 SRR036606 SRR1300653 SRR497602 SRR1200552 SRR1293503
SRR1532569 ERR752926 SRR1969176 SRR1564305 SRR965745 SRR397938 SRR925202
ERR559267 SRR1981700 SRR546564 ERR200017 SRR711188 SRR1239208 SRR1605917
SRR1160718 SRR1574245 ERR557577 SRR070555 ERR372909 SRR806692 ERR193658
SRR1577808 SRR1952700 ERR690200 SRR1147061 SRR1166214 SRR2038200 SRR1955474
SRR394427 ERR473068 SRR500635 SRR586012 SRR1297110 SRR064389 SRR1218214
ERR047453 SRR1787021 SRR1820737 SRR1578059 SRR514816 SRR077212 ERR311029
SRR1180103 ERR696991 ERR564026 ERR045200 SRR681526 ERR501460 SRR502768
ERR370322 SRR1030263 SRR1188220 SRR1344706 SRR1303300 DRR001720 ERR501643
ERR030300 ERR538143 SRR1133228 SRR088309 SRR1222146 ERR366393 SRR1231234
SRR190129 ERR229960 ERR277249 ERR849500 SRR035500 SRR554454 SRR442367
ERR377424 SRR1786143 SRR1946962 SRR1745531 SRR1581002 DRR022782 SRR1284496
SRR1363172 SRR1132900 ERR019338 SRR721172 SRR1107750 SRR605576 SRR1160009
SRR081277 SRR1173534 SRR354202 SRR1518416 SRR341548 SRR1961830 ERR460069
ERR375984 SRR1593374 SRR1993490 ERR361754 SRR519062 SRR1223475 SRR1168604
ERR033400 SRR1087903 SRR401400 ERR904458 SRR1213065 ERR161600 SRR569013
SRR850250 SRR191794 SRR2056977 SRR1230595 ERR599900 ERR129059 ERR137853
ERR440988 ERR776851 SRR1461782 SRR1045121 SRR191911 ERR486769 ERR356169
ERR340518 SRR1615943 DRR023149 SRR1730512 SRR1222634 SRR747900 SRR503579
ERR316802 SRR1191277 ERR230429 SRR1586600 SRR1564736 SRR398096 ERR714600
SRR771214 ERR637949 SRR566976 ERR597518 SRR327445 ERR057793 SRR496610
ERR067800 SRR847775 SRR1025008 SRR1333887 ERR178232 SRR1587595 SRR202932
SRR1006421 SRR924723 SRR647607 ERR137180 SRR972401 ERR120203 SRR408238
SRR520353 SRR587217 SRR1922792 SRR1925721 SRR1574900 SRR1393910 ERR499400
SRR535400 SRR1663100 SRR2000400 SRR1576829 SRR070254 ERR634920 ERR340618
SRR278025 SRR1703162 SRR943983 SRR1539542 DRR013233 SRR835108 SRR867300

ERR460934 SRR1295827 SRR067872 SRR1206352 SRR1164504 ERR334543 SRR403911
SRR960772 ERR713500 ERR875949 SRR513059 ERR348243 SRR1202685 SRR882090
SRR631107 ERR015797 ERR418644 SRR071897 SRR1916370 ERR037948 SRR1647685
SRR835373 SRR1791691 SRR329500 SRR1655209 SRR097528 SRR142654 SRR1089516
SRR1631567 ERR600629 SRR012173 SRR458510 ERR654541 SRR1764945 SRR710256
ERR419800 SRR074004 SRR407430 SRR1379730 SRR1363300 SRR2051385 SRR1393400
SRR663780 SRR2097899 SRR915981 SRR091799 SRR016967 SRR1171050 SRR1027622
SRR340188 SRR064648 SRR004149 ERR012092 SRR2101603 SRR2101508 SRR2101307
SRR2100636 SRR2100502 SRR2100064 SRR2099928 SRR2080404 SRR2075984
SRR2075817 SRR2075302 SRR2075076 SRR2072700 SRR2072026 SRR2068621
SRR2065999 SRR2064836 SRR2063024 SRR2062305 SRR2062215 SRR2061819
SRR2061212 SRR2061193 SRR2060275 SRR2059600 SRR2059450 SRR2058200
SRR2058143 SRR2056000 SRR2054923 SRR2054606 SRR2053825 SRR2053142
SRR2052902 SRR2052865 SRR2052643 SRR2051103 SRR2051097 SRR2049100
SRR2048043 SRR2047602 SRR2047400 SRR2046753 SRR2043986 SRR2043700
SRR2043475 SRR2043045 SRR2040614 SRR2039257 SRR2039107 SRR2039091
SRR2038190 SRR2037125 SRR2035400 SRR2035193 SRR2034200 SRR2034152
SRR2034034 SRR2031992 SRR2029600 SRR2029412 SRR2029300 SRR2029270
SRR2026334 SRR2026222 SRR2025270 SRR2025000 SRR2020582 SRR2016700
SRR2016680 SRR2016305 SRR2016267 SRR2015704 SRR2015694 SRR2015100
SRR2014925 SRR2014836 SRR2014706 SRR2013864 SRR2012817 SRR2012643
SRR2011400 SRR2010659 SRR2010514 SRR2009707 SRR2009015 SRR2008154
SRR2007752 SRR2005902 SRR2005829 SRR2003542 SRR2002460 SRR2001711
SRR2000564 SRR1999780 SRR1999648 SRR1999400 SRR1998046 SRR1997785
SRR1996061 SRR1995923 SRR1995331 SRR1995249 SRR1995130 SRR1993500
SRR1993307 SRR1993231 SRR1986050 SRR1984111 SRR1984091 SRR1982104
SRR1981100 SRR1981076 SRR1980604 SRR1976439 SRR1974532 SRR1973847
SRR1973735 SRR1971595 SRR1971272 SRR1970700 SRR1970300 SRR1970279
SRR1970179 SRR1970078 SRR1969876 SRR1969576 SRR1969476 SRR1969376
SRR1968855 SRR1968755 SRR1968655 SRR1968555 SRR1968055 SRR1967655
SRR1967455 SRR1967355 SRR1966655 SRR1966551 SRR1965941 SRR1965403
SRR1964503 SRR1963470 SRR1963362 SRR1963229 SRR1962108 SRR1962018
SRR1961604 SRR1961503 SRR1961102 SRR1960723 SRR1960611 SRR1960505
SRR1960409 SRR1959320 SRR1959220 SRR1958556 SRR1958256 SRR1957847
SRR1957683 SRR1957307 SRR1955234 SRR1953054 SRR1952900 SRR1952694
SRR1952300 SRR1951420 SRR1950549 SRR1950301 SRR1949651 SRR1947000
SRR1946859 SRR1946703 SRR1946597 SRR1945422 SRR1945303 SRR1945174
SRR1944092 SRR1925409 SRR1924346 SRR1919930 SRR1919624 SRR1917732
SRR1917600 SRR1917481 SRR1917066 SRR1916749 SRR1913711 SRR1910305
SRR1910280 SRR1909701 SRR1909695 SRR1871047 SRR1870683 SRR1870503
SRR1867787 SRR1861831 SRR1849414 SRR1826151 SRR1825866 SRR1824460
SRR1824005 SRR1823094 SRR1822530 SRR1822417 SRR1822300 SRR1821721

SRR1820697 SRR1820237 SRR1820162 SRR1818081 SRR1817835 SRR1817752
SRR1817400 SRR1814236 SRR1814048 SRR1813669 SRR1813424 SRR1812800
SRR1812788 SRR1812335 SRR1811632 SRR1811441 SRR1811336 SRR1810285
SRR1806632 SRR1805907 SRR1805558 SRR1805320 SRR1805257 SRR1804190
SRR1804041 SRR1802336 SRR1802271 SRR1801164 SRR1800288 SRR1799926
SRR1799700 SRR1798200 SRR1797904 SRR1797200 SRR1794069 SRR1793907
SRR1793332 SRR1793283 SRR1792715 SRR1792532 SRR1792042 SRR1791963
SRR1791873 SRR1791271 SRR1790900 SRR1790344 SRR1788951 SRR1788100
SRR1785800 SRR1785701 SRR1785686 SRR1785047 SRR1784833 SRR1783841
SRR1783200 SRR1783195 SRR1777659 SRR1777437 SRR1776687 SRR1773836
SRR1773628 SRR1773588 SRR1773135 SRR1772863 SRR1772401 SRR1772332
SRR1771713 SRR1771531 SRR1770500 SRR1770413 SRR1770393 SRR1770000
SRR1769991 SRR1769300 SRR1769297 SRR1768071 SRR1767912 SRR1767800
SRR1763798 SRR1758588 SRR1757775 SRR1755103 SRR1753847 SRR1752598
SRR1752451 SRR1752281 SRR1750622 SRR1748012 SRR1746766 SRR1745826
SRR1745625 SRR1744604 SRR1743987 SRR1743357 SRR1737208 SRR1736634
SRR1735700 SRR1735617 SRR1735400 SRR1732312 SRR1731920 SRR1730382
SRR1726695 SRR1726428 SRR1725541 SRR1724590 SRR1723383 SRR1721956
SRR1721880 SRR1721669 SRR1714502 SRR1714473 SRR1714339 SRR1713977
SRR1713489 SRR1711790 SRR1710770 SRR1707967 SRR1707353 SRR1706667
SRR1705717 SRR1703823 SRR1703332 SRR1703256 SRR1700874 SRR1698795
SRR1696784 SRR1696636 SRR1695811 SRR1695731 SRR1693395 SRR1688443
SRR1688265 SRR1686410 SRR1686374 SRR1685782 SRR1664801 SRR1664340
SRR1660458 SRR1657063 SRR1656901 SRR1656854 SRR1656211 SRR1656110
SRR1656010 SRR1655710 SRR1655510 SRR1655192 SRR1654327 SRR1653720
SRR1653278 SRR1652533 SRR1649443 SRR1649368 SRR1649166 SRR1648143
SRR1646926 SRR1646682 SRR1646553 SRR1646080 SRR1645958 SRR1645850
SRR1645750 SRR1645054 SRR1643064 SRR1642858 SRR1640701 SRR1639999
SRR1639755 SRR1639662 SRR1639119 SRR1638964 SRR1638792 SRR1638454
SRR1635233 SRR1635105 SRR1634435 SRR1634368 SRR1634065 SRR1631939
SRR1631427 SRR1631200 SRR1623013 SRR1619406 SRR1619200 SRR1618798
SRR1617631 SRR1616936 SRR1616800 SRR1616761 SRR1616100 SRR1615200
SRR1615000 SRR1614991 SRR1614279 SRR1614184 SRR1610001 SRR1609223
SRR1605283 SRR1604900 SRR1604872 SRR1602499 SRR1600273 SRR1599311
SRR1598917 SRR1597469 SRR1596625 SRR1596003 SRR1595970 SRR1593801
SRR1593795 SRR1593400 SRR1592615 SRR1592563 SRR1589696 SRR1588400
SRR1588200 SRR1588187 SRR1588002 SRR1587404 SRR1587323 SRR1585342
SRR1584378 SRR1583202 SRR1582900 SRR1582854 SRR1581500 SRR1578434
SRR1577102 SRR1576600 SRR1576200 SRR1575337 SRR1574305 SRR1573624
SRR1573131 SRR1573090 SRR1572175 SRR1569585 SRR1567300 SRR1567215
SRR1567117 SRR1566521 SRR1564841 SRR1564514 SRR1564486 SRR1562100
SRR1562044 SRR1561900 SRR1561885 SRR1561700 SRR1561688 SRR1561410

SRR1560806 SRR1560712 SRR1556972 SRR1556285 SRR1556100 SRR1556085
SRR1555220 SRR1554984 SRR1553900 SRR1553816 SRR1552611 SRR1552105
SRR1548616 SRR1548394 SRR1544682 SRR1544562 SRR1544433 SRR1539707
SRR1539606 SRR1537500 SRR1537495 SRR1536813 SRR1536355 SRR1536141
SRR1533717 SRR1533454 SRR1530980 SRR1528485 SRR1525263 SRR1524235
SRR1523681 SRR1522653 SRR1522452 SRR1521600 SRR1521513 SRR1521488
SRR1520090 SRR1519419 SRR1519327 SRR1518626 SRR1518537 SRR1518379
SRR1516219 SRR1515236 SRR1515000 SRR1514726 SRR1514698 SRR1514286
SRR1510962 SRR1509959 SRR1509480 SRR1509357 SRR1509100 SRR1507207
SRR1506598 SRR1505903 SRR1503961 SRR1503237 SRR1502835 SRR1502204
SRR1501496 SRR1501315 SRR1501133 SRR1482373 SRR1481800 SRR1462105
SRR1461807 SRR1460466 SRR1460122 SRR1449807 SRR1449719 SRR1449403
SRR1449343 SRR1448931 SRR1448823 SRR1448471 SRR1439849 SRR1439456
SRR1437703 SRR1427241 SRR1425757 SRR1425625 SRR1425538 SRR1425354
SRR1425240 SRR1424605 SRR1423647 SRR1422535 SRR1394036 SRR1393086
SRR1392300 SRR1385145 SRR1384607 SRR1384500 SRR1384498 SRR1382205
SRR1382102 SRR1378592 SRR1378342 SRR1373574 SRR1370997 SRR1368332
SRR1363289 SRR1346410 SRR1344684 SRR1344504 SRR1342456 SRR1342220
SRR1342176 SRR1334913 SRR1334784 SRR1334122 SRR1330356 SRR1328300
SRR1326975 SRR1326203 SRR1324001 SRR1322226 SRR1322008 SRR1314402
SRR1314302 SRR1314215 SRR1313717 SRR1309449 SRR1304298 SRR1303500
SRR1302915 SRR1302001 SRR1301995 SRR1301200 SRR1301186 SRR1300700
SRR1300546 SRR1299010 SRR1297205 SRR1296100 SRR1295950 SRR1295645
SRR1293826 SRR1292880 SRR1292709 SRR1292501 SRR1291915 SRR1291189
SRR1290397 SRR1287030 SRR1286219 SRR1284939 SRR1284500 SRR1284263
SRR1284055 SRR1283858 SRR1283109 SRR1282365 SRR1274066 SRR1273907
SRR1272503 SRR1272499 SRR1270409 SRR1269934 SRR1269876 SRR1269705
SRR1267658 SRR1267526 SRR1266088 SRR1265426 SRR1263445 SRR1262419
SRR1260507 SRR1258033 SRR1257900 SRR1252010 SRR1248502 SRR1248280
SRR1239008 SRR1238654 SRR1238557 SRR1237935 SRR1236601 SRR1236599
SRR1233943 SRR1233632 SRR1233504 SRR1233403 SRR1233301 SRR1232943
SRR1232746 SRR1232437 SRR1232397 SRR1232108 SRR1231833 SRR1231704
SRR1231605 SRR1231525 SRR1231005 SRR1230753 SRR1230084 SRR1229601
SRR1229544 SRR1229414 SRR1228706 SRR1228683 SRR1227207 SRR1226247
SRR1225809 SRR1225788 SRR1225691 SRR1225520 SRR1224281 SRR1224172
SRR1224069 SRR1223936 SRR1223764 SRR1223184 SRR1223053 SRR1222947
SRR1222869 SRR1222509 SRR1222430 SRR1222382 SRR1221705 SRR1221201
SRR1220814 SRR1220708 SRR1220603 SRR1219761 SRR1219204 SRR1218618
SRR1218309 SRR1217479 SRR1216904 SRR1216200 SRR1216162 SRR1215909
SRR1215450 SRR1214900 SRR1214307 SRR1214268 SRR1213948 SRR1213807
SRR1213709 SRR1213236 SRR1213111 SRR1212710 SRR1211223 SRR1211190
SRR1210576 SRR1210481 SRR1210240 SRR1209552 SRR1208824 SRR1208525

SRR1208311 SRR1208217 SRR1207814 SRR1207206 SRR1206238 SRR1206165
SRR1206023 SRR1205360 SRR1205203 SRR1204918 SRR1204899 SRR1203943
SRR1202373 SRR1202083 SRR1201755 SRR1200916 SRR1200837 SRR1200600
SRR1200302 SRR1199563 SRR1198849 SRR1197922 SRR1197700 SRR1192879
SRR1192179 SRR1191727 SRR1189614 SRR1189544 SRR1188629 SRR1188439
SRR1188119 SRR1188082 SRR1187945 SRR1187800 SRR1187181 SRR1186993
SRR1186801 SRR1186316 SRR1186234 SRR1185964 SRR1185703 SRR1184656
SRR1184547 SRR1184483 SRR1184349 SRR1184114 SRR1184000 SRR1183971
SRR1183826 SRR1183200 SRR1183102 SRR1183005 SRR1181401 SRR1181301
SRR1181002 SRR1180804 SRR1180706 SRR1180560 SRR1180482 SRR1180300
SRR1178901 SRR1178838 SRR1178203 SRR1178137 SRR1178081 SRR1177600
SRR1177300 SRR1175217 SRR1175116 SRR1174349 SRR1173943 SRR1173600
SRR1173400 SRR1173341 SRR1173102 SRR1172600 SRR1172566 SRR1172305
SRR1171530 SRR1171394 SRR1169600 SRR1169477 SRR1169228 SRR1169109
SRR1168959 SRR1168438 SRR1168360 SRR1168121 SRR1167401 SRR1167394
SRR1167115 SRR1166598 SRR1166431 SRR1165400 SRR1165399 SRR1164897
SRR1164778 SRR1162826 SRR1162600 SRR1162559 SRR1161444 SRR1160912
SRR1160805 SRR1160422 SRR1160210 SRR1160127 SRR1159700 SRR1159689
SRR1159505 SRR1159491 SRR1158902 SRR1158863 SRR1158000 SRR1157943
SRR1157716 SRR1157476 SRR1156255 SRR1153447 SRR1151595 SRR1150451

Appendix II. Taxonomy Breakdown for DiscoVir Analysis

Viruses

Adenoviridae, Alphetetraviridae, Alvernaviridae, Amalgaviridae, Anelloviridae, Arenaviridae, Ascoviridae, Asfarviridae, Astroviridae, Baculoviridae, Barnaviridae, Benyviridae, Bidnaviridae, Birnaviridae, Bromoviridae, Bunyaviridae, Caliciviridae, Carmotetraviridae, Caulimoviridae, Chrysoviridae, Cilevirus, Circoviridae, Closteroviridae, Emaravirus, Endornaviridae, Flaviviridae, Geminiviridae, Hepadnaviridae, Hepeviridae, Herpesvirales, Higrivirus, Hypoviridae, Idaeovirus, Iridoviridae, Luteoviridae, Marseillevirus, Mimiviridae, Mononegavirales, Nanoviridae, Narnaviridae, Nidovirales, Nimaviridae, Nodaviridae, Nudiviridae, Ophioviridae, Orthomyxoviridae, Ourmiavirus, Papillomaviridae, Partitiviridae, Parvoviridae, Permutotetraviridae, Phycodnaviridae, Picobirnaviridae, Picornavirales, Polydnviridae, Polyomaviridae, Potyviriidae, Poxviridae, Quadriviridae, Reoviridae, Retroviridae, Sobemovirus, Tenuivirus, Togaviridae, Tombusviridae, Totiviridae, Tymovirales, Varicosavirus, Virgaviridae

Bacteria

Acidobacteria, Aquificae, Chrysiogenetes, Deferribacteres, Dictyoglomi, Elusimicrobia, FCB Group, Fusobacteria, Nitrospinae, Nitrospirae, Proteobacteria, PVC Group, Spirochaetes, Synergistetes, Tectomicrobia, Terrabacteria, Thermodesulfobacteria, Thermotogae

Fungi

Blastocladiomycota, Chytridiomycota, Cryptomycota, Dikarya, Microsporidia, Mucoromycota, Neocallimastigomycota, Zoopagomycota

Appendix III. List of SRA Files Searched for Novel Discovirus Sequences

ERR260429, SRR2187590, SRR2187589, SRR3046431, SRR2807659, SRR3046429, SRR1005276, SRR2240273, SRR2127986, SRR2807661, SRR2807660, SRR1999956, SRR1174777, SRR1005306, SRR1005261, SRR3105700, SRR2240260, SRR1837885, SRR1724091, SRR1005298, SRR1005291, SRR1005258, SRR1005312, SRR1005310, SRR1005300, SRR3046430, SRR1778927, SRR1731532, SRR1722393, SRR1233161, SRR1174792, SRR1005317, SRR1005296, SRR1005267, SRR1005263, SRR926248, ERR1059554, SRR2807662, SRR2477711, SRR2132800, SRR1779073, SRR1531164, SRR1233165, SRR1213587, SRR1005308, SRR1005271, ERR1059553, SRR3217256, SRR1302046, SRR1005307, SRR1005257, SRR3156503, SRR1778989, SRR1005309, SRR866531, SRR2807657, SRR2148997, SRR1778921, SRR1562369, SRR1005311, SRR1005260, SRR960254, ERR1059555, ERR748785, ERR748773, ERR167173, SRR2003671, SRR1619672, SRR1298983, SRR1178919, ERR1059557, ERR748777, SRR1618547, SRR1257400, SRR1005303, SRR1005294, SRR1005277, SRR1005297, SRR960252, ERR1059556, SRR3217257, ERR424752, SRR1005301, ERR777826, SRR1257399, SRR1005315, ERR748774, SRR1005259, SRR960261, ERR493373, SRR2131364, SRR1958771, SRR1162292, SRR1178935, SRR1005299, SRR1005313, SRR1005287, ERR167181, SRR1611790, SRR1005292, SRR1005284, ERR886715, SRR1174772, SRR1026209, SRR1588171, SRR1233160, SRR1212862, SRR1026204, SRR1257389, SRR1005323, SRR1005280, ERR777827, ERR1360192, ERR1059552, ERR1360188, ERR167179, SRR960260, ERR167184, SRR3207915, SRR1170742, SRR1005320, SRR2131361, SRR1186869, SRR3046433, SRR2003637, SRR1506121, ERR179753, SRR3046432, SRR2131352, SRR2060956, SRR1822494, SRR1652334, SRR1649311, SRR1588170, SRR1287024, SRR1257390, SRR1233166, SRR1233164, SRR1163705, SRR1162298, SRR1005343, SRR1005314, SRR1005265, ERR1025478, SRR3208051, SRR1163703, SRR1005266, ERR929878, ERR829294, DRR001017, SRR3046440, SRR2131363, SRR2094397, SRR2081043, SRR1588453, SRR1298984, SRR959508, ERR1360179, SRR2807658, SRR2807652, SRR1778932, SRR1162293, SRR1005378, SRR3310309, SRR2676906, SRR1942951, SRR1797599, SRR1720767, SRR1413312, SRR1185546, SRR1005373, DRR001451, SRR1917043, SRR1778924, SRR1564725, SRR1162294, SRR1005318, SRR826599, SRR1720760, SRR1005273, SRR1005304, SRR653057, SRR606404, SRR1594527, SRR3110670, SRR3096280, SRR2477712, SRR2040570, SRR1837875, SRR3204831, SRR3124526, SRR3112066, SRR3046448, SRR2807630, SRR1927120, SRR1778920, SRR1728120, SRR1537559, SRR1005289, ERR1104413, SRR3207877, SRR3046428, SRR2807626, SRR2240272, SRR2167610, SRR1770420, SRR1582386, SRR1537557, SRR1213697, SRR1055109, SRR1033742, SRR1033317, SRR1005268, SRR3105600, SRR2976057, SRR2321320, SRR2240261, SRR2131365, SRR2131351, SRR2120782, SRR1909493, SRR1537552, SRR1266998, SRR1026739, SRR1026335, SRR826644, SRR3207796, SRR2984592, SRR2824359, SRR2003659, SRR2003632, SRR1837717, SRR1770102, SRR1724901, SRR1724088, SRR1698111, SRR1267019, SRR1182649, SRR1170971, SRR1162297, SRR1026338, SRR1005286, SRR912597, SRR837659, SRR826645, SRR653062, SRR606409, ERR908395, ERR908392, ERR690823, ERR424755, DRR029010, SRR3207913, SRR1830868,

SRR447121, ERR908410, ERR789951, ERR748784, ERR748783, ERR424731, DRR006301, SRR867435, SRR831704, ERR260421, SRR952307, ERR908403, ERR367938, SRR3453113, SRR3453112, SRR3452728, SRR3452727, SRR3452726, SRR3452725, SRR3452724, SRR3452723, SRR3452722, SRR3452721, SRR3452720, SRR3452719, SRR3452718, SRR3452717, SRR3440173, SRR3440163, SRR3440144, SRR3417226, SRR3417225, SRR3416390, SRR3416387, SRR3406660, SRR3406553, SRR3406552, SRR3406551, SRR3406518, SRR3406517, SRR3406516, SRR3406515, SRR3406514, SRR3406513, SRR3406512, SRR3406511, SRR3406510, SRR3406509, SRR3406508, SRR3406507, SRR3406506, SRR3406505, SRR3406504, SRR3406503, SRR3406502, SRR3406501, SRR3406500, SRR3406499, SRR3406498, SRR3406497, SRR3406496, SRR3406495, SRR3406493, SRR3406492, SRR3400824, SRR3400823, SRR3400822, SRR3399470, SRR3399469, SRR3399468, SRR3399436, SRR3399433, SRR3399432, SRR3399430, SRR3399429, SRR3399253, SRR3399252, SRR3399051, SRR3389515, SRR3384923, SRR3384922, SRR3384921, SRR3384920, SRR3384919, SRR3384918, SRR3384917, SRR3384916, SRR3384915, SRR3384914, SRR3384913, SRR3384912, SRR3384911, SRR3384910, SRR3384777, SRR3384776, SRR3384775, SRR3384774, SRR3384773, SRR3384772, SRR3384771, SRR3384770, SRR3384769, SRR3384767, SRR3384766, SRR3384765, SRR3384764, SRR3384763, SRR3384762, SRR3384761, SRR3384760, SRR3384759, SRR3384758, SRR3384757, SRR3384328, SRR3384320, SRR3383845, SRR3383844, SRR3383843, SRR3383842, SRR3383841, SRR3383840, SRR3383839, SRR3383838, SRR3383837, SRR3383836, SRR3383835, SRR3383834, SRR3383833, SRR3383832, SRR3383831, SRR3383830, SRR3383829, SRR3383828, SRR3383825, SRR3383824, SRR3383823, SRR3383822, SRR3383821, SRR3383820, SRR3383818, SRR3383817, SRR3383816, SRR3383815, SRR3383814, SRR3383805, SRR3383804, SRR3383803, SRR3383802, SRR3383801, SRR3383800, SRR3383799, SRR3383789, SRR3383788, SRR3383787, SRR3383786, SRR3383785, SRR3383783, SRR3383782, SRR3383781, SRR3383780, SRR3383779, SRR3383778, SRR3383776, SRR3383775, SRR3383774, SRR3383773, SRR3383772, SRR3383771, SRR3383770, SRR3383769, SRR3383768, SRR3383740, SRR3383697, SRR3383696, SRR3383695, SRR3383694, SRR3383693, SRR3383692, SRR3383680, SRR3383667, SRR3383642, SRR3383641, SRR3383640, SRR3383639, SRR3383638, SRR3383637, SRR3383616, SRR3383591, SRR3383545, SRR3383521, SRR3383472, SRR3383470, SRR3383469, SRR3383468, SRR3383467, SRR3383464, SRR3383446, SRR3383444, SRR3383443, SRR3383442, SRR3383441, SRR3383431, SRR3383428, SRR3383427, SRR3383426, SRR3383425, SRR3383424, SRR3383420, SRR3383419, SRR3383418, SRR3383417, SRR3382395, SRR3382394, SRR3382393, SRR3382392, SRR3382391, SRR3372478, SRR3371876, SRR3371867, SRR3371866, SRR3371865, SRR3371864, SRR3371863, SRR3371862, SRR3371861, SRR3371860, SRR3371859, SRR3371858, SRR3371857, SRR3371856, SRR3371855, SRR3371854, SRR3371853, SRR3371852, SRR3371851, SRR3371850, SRR3371849, SRR3371848, SRR3371847, SRR3371846, SRR3371845, SRR3371844, SRR3371843, SRR3371842, SRR3371841, SRR3371840, SRR3371839, SRR3371838, SRR3371837, SRR3371836, SRR3371835, SRR3371834, SRR3371833, SRR3371832,

SRR3371357, SRR3371356, SRR3371355, SRR3371354, SRR3371353, SRR3371352,
SRR3371351, SRR3371350, SRR3371349, SRR3371348, SRR3371347, SRR3371346,
SRR3371344, SRR3371343, SRR3371342, SRR3371341, SRR3371340, SRR3371339,
SRR3371338, SRR3371337, SRR3371336, SRR3371335, SRR3371334, SRR3371333,
SRR3371332, SRR3371331, SRR3371330, SRR3371329, SRR3371328, SRR3371327,
SRR3371326, SRR3371325, SRR3371324, SRR3371323, SRR3371322, SRR3371321,
SRR3371320, SRR3371319, SRR3371318, SRR3371317, SRR3371316, SRR3371315,
SRR3371314, SRR3371313, SRR3371312, SRR3371311, SRR3371310, SRR3371309,
SRR3371308, SRR3371307, SRR3371306, SRR3371305, SRR3371304, SRR3371303,
SRR3371302, SRR3371301, SRR3371300, SRR3371299, SRR3371298, SRR3371297,
SRR3371296, SRR3371295, SRR3371294, SRR3371293, SRR3371292, SRR3371291,
SRR3371290, SRR3371289, SRR3371288, SRR3371287, SRR3371286, SRR3367957,
SRR3367956, SRR3367955, SRR3363172, SRR3363171, SRR3363170, SRR3363169,
SRR3356865, SRR3350460, SRR3350459, SRR3350458, SRR3350457, SRR3350456,
SRR3350455, SRR3350454, SRR3350453, SRR3350452, SRR3350451, SRR3350450,
SRR3350449, SRR3350419, SRR3350418, SRR3350417, SRR3350416, SRR3348568,
SRR3348567, SRR3348566, SRR3348565, SRR3348564, SRR3348563, SRR3348562,
SRR3348561, SRR3348560, SRR3348559, SRR3348558, SRR3348557, SRR3348556,
SRR3348555, SRR3348554, SRR3348553, SRR3348552, SRR3348551, SRR3348550,
SRR3348549, SRR3348548, SRR3348547, SRR3348546, SRR3348545, SRR3348544,
SRR3348543, SRR3348542, SRR3348073, SRR3347501, SRR3341905, SRR3341859,
SRR3341858, SRR3341856, SRR3331195, SRR3331151, SRR3331150, SRR3331149,
SRR3331143, SRR3331136, SRR3331135, SRR3331133, SRR3331132, SRR3330404,
SRR3330403, SRR3330400, SRR3330399, SRR3330398, SRR3330397, SRR3330396,
SRR3330395, SRR3330394, SRR3330393, SRR3330392, SRR3329325, SRR3329323,
SRR3329322, SRR3329321, SRR3329320, SRR3329319, SRR3329318, SRR3329317,
SRR3329316, SRR3326255, SRR3326254, SRR3326253, SRR3326048, SRR3325327,
SRR3325326, SRR3325325, SRR3325324, SRR3325323, SRR3325322, SRR3325321,
SRR3325320, SRR3325319, SRR3325318, SRR3325317, SRR3325316, SRR3325315,
SRR3325314, SRR3325312, SRR3325311, SRR3325310, SRR3325309, SRR3325308,
SRR3325307, SRR3325306, SRR3325305, SRR3325304, SRR3325303, SRR3325302,
SRR3325301, SRR3325300, SRR3325299, SRR3325298, SRR3325297, SRR3325296,
SRR3325295, SRR3325294, SRR3325293, SRR3323101, SRR3323100, SRR3323099,
SRR3323098, SRR3323097, SRR3323096, SRR3323095, SRR3323094, SRR3323093,
SRR3323092, SRR3318060, SRR3318059, SRR3318058, SRR3318057, SRR3318056,
SRR3318055, SRR3318054, SRR3318053, SRR3318052, SRR3318051, SRR3318050,
SRR3318049, SRR3318048, SRR3318047, SRR3318046, SRR3318045, SRR3318044,
SRR3318043, SRR3318042, SRR3318041, SRR3318040, SRR3318039, SRR3318038,
SRR3318037, SRR3318036, SRR3318035, SRR3318034, SRR3318033, SRR3318032,
SRR3318031, SRR3318030, SRR3318029, SRR3318028, SRR3318027, SRR3318026,
SRR3318025, SRR3318024, SRR3318023, SRR3318022, SRR3318021, SRR3318020,
SRR3318019, SRR3318018, SRR3318017, SRR3318016, SRR3318015, SRR3318014,

SRR3318013, SRR3318012, SRR3318011, SRR3318010, SRR3318009, SRR3318008, SRR3318007, SRR3318006, SRR3316715, SRR3314333, SRR3314332, SRR3314331, SRR3314330, SRR3314329, SRR3314328, SRR3314327, SRR3314326, SRR3314325, SRR3314324, SRR3314323, SRR3314322, SRR3314321, SRR3314320, SRR3314319, SRR3314318, SRR3314317, SRR3314316, SRR3311812, SRR3311811, SRR3311810, SRR3311809, SRR3311808, SRR3311807, SRR3310311, SRR3310310, SRR3310308, SRR3310047, SRR3310046, SRR3310045, SRR3310044, SRR3309446, SRR3309445, SRR3309444, SRR3309151, SRR3309148, SRR3309147, SRR3309145, SRR3309134, SRR3308986, SRR3308560, SRR3305232, SRR3299637, SRR3298414, SRR3298014, SRR3294424, SRR3294060, SRR3291800, SRR3291759, SRR3290124, SRR3290084, SRR3290078, SRR3290062, SRR3290056, SRR3290055, SRR3290052, SRR3290051, SRR3290042, SRR3290040, SRR3290035, SRR3290034, SRR3289375, SRR3289374, SRR3289373, SRR3289372, SRR3289352, SRR3289311, SRR3289284, SRR3289283, SRR3288880, SRR3288878, SRR3288867, SRR3288866, SRR3288865, SRR3288864, SRR3288837, SRR3288836, SRR3288835, SRR3288834, SRR3288833, SRR3288832, SRR3288830, SRR3288828, SRR3288825, SRR3288824, SRR3288822, SRR3288821, SRR3288820, SRR3288570, SRR3288568, SRR3286663, SRR3286654, SRR3286642, SRR3286625, SRR3286489, SRR3286447, SRR3285986, SRR3285985, SRR3285984, SRR3285983, SRR3285982, SRR3285981, SRR3285980, SRR3285979, SRR3285978, SRR3285977, SRR3285976, SRR3285975, SRR3285974, SRR3285973, SRR3285972, SRR3285971, SRR3285970, SRR3285969, SRR3285968, SRR3285967, SRR3285966, SRR3285965, SRR3285964, SRR3285963, SRR3285962, SRR3285961, SRR3285960, SRR3285595, SRR3285594, SRR3285593, SRR3285592, SRR3285591, SRR3285590, SRR3285589, SRR3285082, SRR3284484, SRR3284483, SRR3284482, SRR3284481, SRR3284480, SRR3284479, SRR3284478, SRR3284477, SRR3284476, SRR3284475, SRR3284474, SRR3284473, SRR3276128, SRR3274786, SRR3274785, SRR3274784, SRR3274783, SRR3274781, SRR3274775, SRR3274774, SRR3274771, SRR3274769, SRR3274768, SRR3274767, SRR3274766, SRR3274765, SRR3274764, SRR3274743, SRR3274742, SRR3274738, SRR3274717, SRR3274714, SRR3274713, SRR3274712, SRR3274711, SRR3274710, SRR3274709, SRR3274708, SRR3274707, SRR3274706, SRR3274702, SRR3274697, SRR3274694, SRR3274693, SRR3274692, SRR3274691, SRR3274690, SRR3274689, SRR3274688, SRR3274687, SRR3274686, SRR3274685, SRR3274684, SRR3274683, SRR3274682, SRR3274681, SRR3274680, SRR3274679, SRR3274678, SRR3274676, SRR3274675, SRR3274674, SRR3274673, SRR3274672, SRR3274671, SRR3274670, SRR3274669, SRR3274668, SRR3274667, SRR3274666, SRR3274665, SRR3274664, SRR3274663, SRR3273237, SRR3273236, SRR3273235, SRR3264877, SRR3264876, SRR3255937, SRR3255936, SRR3255935, SRR3255934, SRR3255933, SRR3255932, SRR3255931, SRR3255930, SRR3255929, SRR3255928, SRR3255927, SRR3255926, SRR3250238, SRR3250237, SRR3233398, SRR3233397, SRR3233396, SRR3233395, SRR3233394, SRR3233393, SRR3233392, SRR3233391, SRR3233390, SRR3233389, SRR3233388, SRR3233387, SRR3233386, SRR3233385, SRR3233384, SRR3233383, SRR3233382, SRR3233381, SRR3233380, SRR3233379, SRR3233378, SRR3233377, SRR3233376, SRR3233375, SRR3233374, SRR3233373, SRR3233372, SRR3233371, SRR3233370, SRR3233369, SRR3233368, SRR3233367, SRR3233366, SRR3233365, SRR3233364, SRR3233363, SRR3233362, SRR3233361, SRR3233360, SRR3233359, SRR3233358, SRR3233357, SRR3233356, SRR3233355, SRR3233354, SRR3233353, SRR3233352, SRR3233351, SRR3233350, SRR3233349, SRR3233348, SRR3233347, SRR3233346, SRR3233345, SRR3233344, SRR3233343, SRR3233342, SRR3233341, SRR3233340, SRR3233339, SRR3233338, SRR3233337, SRR3233336, SRR3233335, SRR3233334, SRR3233333, SRR3233332, SRR3233331, SRR3233330, SRR3233329,

SRR3233328, SRR3233327, SRR3233326, SRR3229094, SRR3228522, SRR3228521, SRR3228520, SRR3228519, SRR3228518, SRR3228517, SRR3226902, SRR3226901, SRR3226900, SRR3226899, SRR3226898, SRR3226897, SRR3226896, SRR3226895, SRR3225572, SRR3225528, SRR3223702, SRR3223423, SRR3218589, SRR3217893, SRR3217892, SRR3217319, SRR3217318, SRR3217317, SRR3217315, SRR3217304, SRR3217301, SRR3217299, SRR3217298, SRR3217297, SRR3217294, SRR3217292, SRR3217284, SRR3217283, SRR3217282, SRR3217281, SRR3217280, SRR3217279, SRR3217278, SRR3217277, SRR3217276, SRR3210688, SRR3210666, SRR3210665, SRR3209579, SRR3209578, SRR3209577, SRR3209576, SRR3209575, SRR3209574, SRR3209573, SRR3209572, SRR3209571, SRR3209570, SRR3209569, SRR3209568, SRR3208062, SRR3208061, SRR3208060, SRR3208059, SRR3208058, SRR3208057, SRR3208056, SRR3208055, SRR3208054, SRR3208053, SRR3208052, SRR3208050, SRR3208049, SRR3208048, SRR3208047, SRR3208046, SRR3208045, SRR3208044, SRR3208043, SRR3208042, SRR3208041, SRR3208040, SRR3208039, SRR3208038, SRR3208037, SRR3208036, SRR3208035, SRR3208034, SRR3208033, SRR3208032, SRR3208031, SRR3208030, SRR3208029, SRR3208028, SRR3208027, SRR3208026, SRR3208025, SRR3208024, SRR3208023, SRR3208022, SRR3208021, SRR3208020, SRR3208019, SRR3208018, SRR3208017, SRR3208016, SRR3208015, SRR3208014, SRR3208013, SRR3208012, SRR3208011, SRR3208010, SRR3208009, SRR3208008, SRR3208007, SRR3208006, SRR3208005, SRR3208004, SRR3208003, SRR3208002, SRR3208001, SRR3208000, SRR3207999, SRR3207998, SRR3207997, SRR3207996, SRR3207995, SRR3207994, SRR3207993, SRR3207992, SRR3207991, SRR3207990, SRR3207989, SRR3207988, SRR3207987, SRR3207986, SRR3207985, SRR3207984, SRR3207983, SRR3207982, SRR3207981, SRR3207980, SRR3207979, SRR3207978, SRR3207977, SRR3207976, SRR3207975, SRR3207974, SRR3207973, SRR3207972, SRR3207971, SRR3207970, SRR3207969, SRR3207968, SRR3207967, SRR3207966, SRR3207965, SRR3207964, SRR3207963, SRR3207962, SRR3207961, SRR3207960, SRR3207959, SRR3207958, SRR3207957, SRR3207956, SRR3207955, SRR3207954, SRR3207953, SRR3207952, SRR3207951, SRR3207950, SRR3207949, SRR3207948, SRR3207947, SRR3207946, SRR3207945, SRR3207944, SRR3207943, SRR3207942, SRR3207941, SRR3207940, SRR3207939, SRR3207938, SRR3207937, SRR3207936, SRR3207935, SRR3207933, SRR3207932, SRR3207931, SRR3207930, SRR3207929, SRR3207928, SRR3207927, SRR3207926, SRR3207925, SRR3207924, SRR3207923, SRR3207922, SRR3207921, SRR3207920, SRR3207919, SRR3207918, SRR3207917, SRR3207916, SRR3207914, SRR3207912, SRR3207911, SRR3207910, SRR3207909, SRR3207908, SRR3207907, SRR3207906, SRR3207905, SRR3207904, SRR3207903, SRR3207902, SRR3207901, SRR3207900, SRR3207899, SRR3207898, SRR3207897, SRR3207896, SRR3207895, SRR3207894, SRR3207893, SRR3207892, SRR3207891, SRR3207890, SRR3207889, SRR3207888, SRR3207887, SRR3207886, SRR3207885, SRR3207884, SRR3207883, SRR3207882, SRR3207881, SRR3207880, SRR3207879, SRR3207878, SRR3207876, SRR3207875, SRR3207874, SRR3207873, SRR3207872, SRR3207871, SRR3207870, SRR3207869, SRR3207868, SRR3207867, SRR3207866,

SRR3207865, SRR3207864, SRR3207863, SRR3207862, SRR3207861, SRR3207860,
SRR3207859, SRR3207858, SRR3207857, SRR3207856, SRR3207855, SRR3207854,
SRR3207853, SRR3207852, SRR3207851, SRR3207850, SRR3207849, SRR3207848,
SRR3207847, SRR3207846, SRR3207845, SRR3207844, SRR3207843, SRR3207842,
SRR3207841, SRR3207840, SRR3207839, SRR3207838, SRR3207837, SRR3207836,
SRR3207835, SRR3207834, SRR3207833, SRR3207832, SRR3207831, SRR3207830,
SRR3207829, SRR3207828, SRR3207827, SRR3207826, SRR3207825, SRR3207824,
SRR3207823, SRR3207822, SRR3207821, SRR3207820, SRR3207819, SRR3207818,
SRR3207817, SRR3207816, SRR3207815, SRR3207814, SRR3207813, SRR3207812,
SRR3207811, SRR3207810, SRR3207809, SRR3207808, SRR3207807, SRR3207806,
SRR3207805, SRR3207804, SRR3207803, SRR3207802, SRR3207801, SRR3207800,
SRR3207799, SRR3207798, SRR3207797, SRR3207795, SRR3207794, SRR3207793,
SRR3207792, SRR3207791, SRR3207790, SRR3207789, SRR3207788, SRR3207787,
SRR3207786, SRR3207785, SRR3207784, SRR3207783, SRR3207782, SRR3207781,
SRR3207780, SRR3207779, SRR3207778, SRR3207777, SRR3207776, SRR3207775,
SRR3207774, SRR3207773, SRR3207772, SRR3207771, SRR3207770, SRR3207769,
SRR3207768, SRR3207767, SRR3207766, SRR3207765, SRR3207764, SRR3207763,
SRR3207762, SRR3207761, SRR3207760, SRR3207759, SRR3207758, SRR3207757,
SRR3207756, SRR3207755, SRR3207754, SRR3207753, SRR3207752, SRR3207751,
SRR3207750, SRR3207749, SRR3207748, SRR3207747, SRR3207746, SRR3207745,
SRR3207744, SRR3207743, SRR3207742, SRR3207741, SRR3207740, SRR3207739,
SRR3207738, SRR3207737, SRR3207736, SRR3207735, SRR3207734, SRR3207733,
SRR3207732, SRR3207731, SRR3207730, SRR3207729, SRR3207728, SRR3207727,
SRR3207726, SRR3207725, SRR3207724, SRR3207723, SRR3207722, SRR3207721,
SRR3207720, SRR3207719, SRR3207718, SRR3207717, SRR3207716, SRR3207715,
SRR3207714, SRR3207713, SRR3207712, SRR3207711, SRR3207710, SRR3207709,
SRR3207708, SRR3207707, SRR3207706, SRR3207705, SRR3207704, SRR3207703,
SRR3207702, SRR3207701, SRR3207700, SRR3207699, SRR3207698, SRR3207697,
SRR3207696, SRR3207695, SRR3207694, SRR3207693, SRR3207692, SRR3207691,
SRR3207690, SRR3207689, SRR3207688, SRR3207687, SRR3207686, SRR3207685,
SRR3207657, SRR3207656, SRR3207655, SRR3207654, SRR3207653, SRR3207652,
SRR3207651, SRR3207650, SRR3207649, SRR3207648, SRR3207399, SRR3207397,
SRR3204833, SRR3204832, SRR3204535, SRR3204384, SRR3204383, SRR3204382,
SRR3204381, SRR3204380, SRR3204378, SRR3204350, SRR3204349, SRR3204348,
SRR3204286, SRR3204285, SRR3204284, SRR3204283, SRR3204282, SRR3204281,
SRR3204280, SRR3204279, SRR3204278, SRR3204277, SRR3204276, SRR3204275,
SRR3204274, SRR3204273, SRR3204272, SRR3204271, SRR3204270, SRR3204269,
SRR3204268, SRR3204267, SRR3204266, SRR3204265, SRR3204264, SRR3204263,
SRR3204213, SRR3203917, SRR3203916, SRR3203826, SRR3203825, SRR3203824,
SRR3203823, SRR3203822, SRR3203780, SRR3203365, SRR3203268, SRR3203266,
SRR3203265, SRR3203241, SRR3201544, SRR3201540, SRR3201507, SRR3198233,
SRR3195360, SRR3192856, SRR3190691, SRR3190690, SRR3190689, SRR3190688,

SRR3190686, SRR3190684, SRR3190682, SRR3190680, SRR3190557, SRR3190547, SRR3190539, SRR3190532, SRR3190529, SRR3190528, SRR3190527, SRR3190526, SRR3190106, SRR3190105, SRR3190002, SRR3189961, SRR3189876, SRR3189875, SRR3189873, SRR3189872, SRR3189869, SRR3189868, SRR3189865, SRR3189863, SRR3189819, SRR3187068, SRR3187067, SRR3187066, SRR3187028, SRR3187027, SRR3187026, SRR3186921, SRR3183202, SRR3182795, SRR3180884, SRR3180869, SRR3180868, SRR3180867, SRR3180866, SRR3180865, SRR3180864, SRR3180863, SRR3180862, SRR3180859, SRR3180858, SRR3180857, SRR3180856, SRR3180854, SRR3180853, SRR3180852, SRR3180851, SRR3180850, SRR3180849, SRR3180848, SRR3180847, SRR3180846, SRR3180844, SRR3180843, SRR3180842, SRR3180841, SRR3180840, SRR3180839, SRR3180838, SRR3180837, SRR3180836, SRR3180831, SRR3180778, SRR3180777, SRR3180743, SRR3180742, SRR3180665, SRR3180664, SRR3180663, SRR3180661, SRR3180660, SRR3180659, SRR3180615, SRR3180613, SRR3180612, SRR3180610, SRR3180607, SRR3180604, SRR3180603, SRR3180600, SRR3180599, SRR3180543, SRR3180542, SRR3180541, SRR3180517, SRR3180481, SRR3180447, SRR3180318, SRR3180088, SRR3180080, SRR3180073, SRR3180064, SRR3179988, SRR3179642, SRR3179623, SRR3179593, SRR3178612, SRR3178611, SRR3178610, SRR3178609, SRR3178608, SRR3178607, SRR3178606, SRR3178605, SRR3178604, SRR3178603, SRR3178602, SRR3178601, SRR3178600, SRR3178363, SRR3176899, SRR3176898, SRR3176896, SRR3176518, SRR3176517, SRR3176516, SRR3176515, SRR3176514, SRR3176513, SRR3176512, SRR3176511, SRR3176510, SRR3176509, SRR3176508, SRR3176507, SRR3176506, SRR3176505, SRR3176504, SRR3176503, SRR3176502, SRR3176501, SRR3176500, SRR3176499, SRR3176498, SRR3176497, SRR3176496, SRR3176495, SRR3175207, SRR3175206, SRR3171724, SRR3171723, SRR3171722, SRR3171720, SRR3171719, SRR3171716, SRR3170528, SRR3170527, SRR3170526, SRR3170525, SRR3170524, SRR3169844, SRR3168913, SRR3168571, SRR3166985, SRR3157076, SRR3157075, SRR3157074, SRR3157073, SRR3157072, SRR3157071, SRR3157070, SRR3157069, SRR3157068, SRR3157067, SRR3157066, SRR3157065, SRR3157064, SRR3157063, SRR3157062, SRR3157061, SRR3157060, SRR3157059, SRR3157058, SRR3157057, SRR3157056, SRR3157055, SRR3157054, SRR3157053, SRR3157052, SRR3157051, SRR3157050, SRR3157049, SRR3157048, SRR3157047, SRR3157046, SRR3157045, SRR3157044, SRR3157043, SRR3157042, SRR3157041, SRR3156572, SRR3156571, SRR3156570, SRR3156569, SRR3156568, SRR3156567, SRR3156566, SRR3156565, SRR3156564, SRR3156563, SRR3156562, SRR3156561, SRR3156560, SRR3156559, SRR3156558, SRR3156557, SRR3156556, SRR3156555, SRR3156554, SRR3156553, SRR3156552, SRR3156551, SRR3156550, SRR3156549, SRR3156548, SRR3156547, SRR3156546, SRR3156545, SRR3156544, SRR3156543, SRR3156542, SRR3156541, SRR3156540, SRR3156539, SRR3156538, SRR3156537, SRR3156536, SRR3156535, SRR3156534, SRR3156533, SRR3156532, SRR3156531, SRR3156530, SRR3156529, SRR3156528, SRR3156527, SRR3156526, SRR3156525, SRR3156524, SRR3156523, SRR3156522, SRR3156521, SRR3156520, SRR3156519, SRR3156518, SRR3156517, SRR3156516, SRR3156515,

SRR3156514, SRR3156513, SRR3156512, SRR3156511, SRR3156510, SRR3156509, SRR3156508, SRR3156507, SRR3156506, SRR3156505, SRR3156504, SRR3156502, SRR3156501, SRR3156500, SRR3156499, SRR3156498, SRR3156497, SRR3156496, SRR3156495, SRR3156494, SRR3156493, SRR3156492, SRR3156491, SRR3156490, SRR3156489, SRR3156488, SRR3156487, SRR3156486, SRR3156485, SRR3156484, SRR3156483, SRR3156482, SRR3156481, SRR3156480, SRR3156479, SRR3156478, SRR3156477, SRR3156476, SRR3156475, SRR3156474, SRR3156473, SRR3156472, SRR3156471, SRR3156470, SRR3156469, SRR3156468, SRR3156467, SRR3156466, SRR3156465, SRR3156464, SRR3156463, SRR3156462, SRR3156461, SRR3156460, SRR3156459, SRR3156458, SRR3156457, SRR3156456, SRR3156455, SRR3156454, SRR3156453, SRR3156452, SRR3156451, SRR3156450, SRR3156449, SRR3156448, SRR3156447, SRR3156446, SRR3156445, SRR3156444, SRR3156443, SRR3156442, SRR3156441, SRR3156440, SRR3156439, SRR3156438, SRR3156437, SRR3156436, SRR3156435, SRR3156434, SRR3156433, SRR3156432, SRR3156431, SRR3156430, SRR3156429, SRR3156428, SRR3156427, SRR3156426, SRR3156425, SRR3156424, SRR3156423, SRR3156422, SRR3156421, SRR3156420, SRR3156419, SRR3156418, SRR3156417, SRR3156416, SRR3156415, SRR3156414, SRR3156413, SRR3156412, SRR3156411, SRR3156410, SRR3156409, SRR3156408, SRR3156407, SRR3156406, SRR3156405, SRR3156404, SRR3156403, SRR3156402, SRR3156401, SRR3156400, SRR3156399, SRR3156398, SRR3156397, SRR3156396, SRR3156395, SRR3156394, SRR3156393, SRR3151744, SRR3151743, SRR3151742, SRR3151741, SRR3151740, SRR3151739, SRR3151738, SRR3151737, SRR3151736, SRR3151735, SRR3151734, SRR3151733, SRR3147786, SRR3147785, SRR3147784, SRR3147783, SRR3146651, SRR3141500, SRR3141498, SRR3141496, SRR3141493, SRR3141466, SRR3141465, SRR3141366, SRR3141296, SRR3141295, SRR3141294, SRR3141293, SRR3141291, SRR3141290, SRR3141289, SRR3141288, SRR3141275, SRR3141274, SRR3140568, SRR3140567, SRR3140565, SRR3140513, SRR3140228, SRR3140224, SRR3140223, SRR3140216, SRR3138275, SRR3138274, SRR3138272, SRR3138238, SRR3138237, SRR3138236, SRR3138235, SRR3138234, SRR3138233, SRR3138232, SRR3138231, SRR3138230, SRR3138229, SRR3138228, SRR3138227, SRR3138226, SRR3138225, SRR3138224, SRR3138223, SRR3138222, SRR3138221, SRR3138220, SRR3138219, SRR3138218, SRR3138217, SRR3138216, SRR3138215, SRR3138214, SRR3138213, SRR3138212, SRR3138211, SRR3138210, SRR3138209, SRR3138208, SRR3138207, SRR3138110, SRR3137656, SRR3137627, SRR3137611, SRR3137251, SRR3136914, SRR3136913, SRR3136912, SRR3136911, SRR3136909, SRR3136908, SRR3136907, SRR3136906, SRR3136905, SRR3136904, SRR3136903, SRR3136902, SRR3136901, SRR3136730, SRR3136729, SRR3134975, SRR3134974, SRR3134973, SRR3134972, SRR3134971, SRR3134970, SRR3134969, SRR3134968, SRR3134967, SRR3134966, SRR3134965, SRR3134964, SRR3134963, SRR3134962, SRR3134961, SRR3134960, SRR3134959, SRR3134958, SRR3134957, SRR3134956, SRR3134955, SRR3134954, SRR3134953, SRR3134952, SRR3134950, SRR3134949, SRR3134948, SRR3134947, SRR3134946, SRR3134945, SRR3134944, SRR3134943, SRR3134942, SRR3134941,

SRR3134151, SRR3134150, SRR3134149, SRR3134148, SRR3134147, SRR3134146, SRR3134145, SRR3134144, SRR3134143, SRR3134142, SRR3134141, SRR3134140, SRR3134139, SRR3134138, SRR3134137, SRR3134136, SRR3134135, SRR3134134, SRR3134133, SRR3134132, SRR3134131, SRR3134130, SRR3134129, SRR3134128, SRR3134127, SRR3134126, SRR3134125, SRR3134124, SRR3134123, SRR3134122, SRR3134121, SRR3134120, SRR3134119, SRR3134118, SRR3134117, SRR3134116, SRR3134115, SRR3134114, SRR3134113, SRR3134112, SRR3134111, SRR3134110, SRR3134109, SRR3134108, SRR3134107, SRR3134106, SRR3134105, SRR3134104, SRR3134103, SRR3134102, SRR3134101, SRR3134100, SRR3134099, SRR3134098, SRR3134097, SRR3134096, SRR3134095, SRR3134094, SRR3134093, SRR3134092, SRR3134091, SRR3134090, SRR3134089, SRR3134088, SRR3134087, SRR3134086, SRR3134085, SRR3134084, SRR3134083, SRR3134082, SRR3134081, SRR3134080, SRR3134079, SRR3134078, SRR3134077, SRR3134076, SRR3134075, SRR3134074, SRR3134073, SRR3134072, SRR3134071, SRR3134070, SRR3134069, SRR3134068, SRR3134067, SRR3134066, SRR3134065, SRR3134064, SRR3134063, SRR3134062, SRR3134061, SRR3134060, SRR3134059, SRR3134058, SRR3134057, SRR3134056, SRR3134055, SRR3134054, SRR3134053, SRR3134052, SRR3134051, SRR3134050, SRR3134049, SRR3134048, SRR3134047, SRR3134046, SRR3134045, SRR3134044, SRR3134043, SRR3134042, SRR3134041, SRR3134040, SRR3134039, SRR3134038, SRR3134037, SRR3134036, SRR3134035, SRR3134034, SRR3134033, SRR3134032, SRR3134031, SRR3134030, SRR3134029, SRR3134028, SRR3134027, SRR3134026, SRR3134025, SRR3134024, SRR3134023, SRR3134022, SRR3134021, SRR3134020, SRR3134019, SRR3134018, SRR3134017, SRR3134016, SRR3134015, SRR3134014, SRR3134013, SRR3134012, SRR3130846, SRR3130845, SRR3130844, SRR3130843, SRR3130842, SRR3130841, SRR3130840, SRR3130839, SRR3130568, SRR3130567, SRR3130566, SRR3130564, SRR3130563, SRR3130562, SRR3130561, SRR3130559, SRR3130558, SRR3130556, SRR3130553, SRR3130551, SRR3130550, SRR3130548, SRR3130546, SRR3130544, SRR3130005, SRR3129968, SRR3129964, SRR3129960, SRR3129118, SRR3124529, SRR3124528, SRR3124527, SRR3124517, SRR3124515, SRR3123670, SRR3123669, SRR3123642, SRR3123627, SRR3123626, SRR3123625, SRR3123623, SRR3123622, SRR3123620, SRR3123619, SRR3123617, SRR3123616, SRR3123615, SRR3123614, SRR3123613, SRR3123612, SRR3123611, SRR3123610, SRR3123607, SRR3123606, SRR3123386, SRR3123383, SRR3123379, SRR3123378, SRR3123376, SRR3123374, SRR3123370, SRR3123368, SRR3123366, SRR3123358, SRR3123353, SRR3123352, SRR3123350, SRR3123336, SRR3123334, SRR3122250, SRR3122249, SRR3122248, SRR3122144, SRR3116231, SRR3116230, SRR3116229, SRR3116228, SRR3116227, SRR3116226, SRR3116025, SRR3114960, SRR3113360, SRR3113349, SRR3113338, SRR3113327, SRR3113316, SRR3113315, SRR3113314, SRR3113312, SRR3112194, SRR3112193, SRR3112192, SRR3112191, SRR3112190, SRR3112189, SRR3112188, SRR3112187, SRR3112186, SRR3112185, SRR3112184, SRR3112183, SRR3112182, SRR3112181, SRR3112180, SRR3112179, SRR3112178, SRR3112177, SRR3112176, SRR3112175, SRR3112174, SRR3112173, SRR3112172,

SRR3111881, SRR3111880, SRR3111879, SRR3111878, SRR3111877, SRR3111876,
SRR3111875, SRR3111874, SRR3111873, SRR3111872, SRR3111871, SRR3111870,
SRR3111869, SRR3111868, SRR3111867, SRR3111866, SRR3111865, SRR3111638,
SRR3111627, SRR3111624, SRR3111623, SRR3111615, SRR3111576, SRR3111571,
SRR3111565, SRR3110747, SRR3110746, SRR3110745, SRR3110744, SRR3110743,
SRR3110742, SRR3110741, SRR3110740, SRR3110739, SRR3110738, SRR3110737,
SRR3110736, SRR3110735, SRR3110734, SRR3110733, SRR3110732, SRR3110731,
SRR3110730, SRR3110729, SRR3110728, SRR3110727, SRR3110726, SRR3110725,
SRR3110724, SRR3110723, SRR3110722, SRR3110721, SRR3110720, SRR3110719,
SRR3110718, SRR3110717, SRR3110716, SRR3110715, SRR3110714, SRR3110713,
SRR3110712, SRR3110711, SRR3110710, SRR3110709, SRR3110708, SRR3110707,
SRR3110706, SRR3110705, SRR3110704, SRR3110703, SRR3110702, SRR3110701,
SRR3110700, SRR3110699, SRR3110698, SRR3110697, SRR3110696, SRR3110695,
SRR3110694, SRR3110693, SRR3110692, SRR3110691, SRR3110690, SRR3110689,
SRR3110688, SRR3110687, SRR3110686, SRR3110685, SRR3110684, SRR3110683,
SRR3110682, SRR3110681, SRR3110680, SRR3110679, SRR3110678, SRR3110677,
SRR3110676, SRR3110675, SRR3110674, SRR3110673, SRR3110672, SRR3110671,
SRR3110669, SRR3110668, SRR3110667, SRR3110666, SRR3110665, SRR3110664,
SRR3110663, SRR3110662, SRR3110661, SRR3110660, SRR3110659, SRR3110658,
SRR3110657, SRR3110656, SRR3105599, SRR3105598, SRR3105597, SRR3105596,
SRR3105595, SRR3105594, SRR3103104, SRR3102909, SRR3101772, SRR3101771,
SRR3101770, SRR3101769, SRR3101768, SRR3101767, SRR3101766, SRR3101765,
SRR3101764, SRR3101763, SRR3101762, SRR3101761, SRR3101760, SRR3101759,
SRR3101758, SRR3101757, SRR3101756, SRR3101755, SRR3101754, SRR3101753,
SRR3101752, SRR3101751, SRR3101750, SRR3101749, SRR3101748, SRR3101747,
SRR3101746, SRR3101745, SRR3101744, SRR3101743, SRR3101742, SRR3101741,
SRR3100795, SRR3100255, SRR3100254, SRR3100253, SRR3100252, SRR3100251,
SRR3100250, SRR3100249, SRR3100248, SRR3100247, SRR3100237, SRR3100099,
SRR3100098, SRR3100097, SRR3099655, SRR3099654, SRR3099652, SRR3099212,
SRR3099211, SRR3099209, SRR3099208, SRR3099028, SRR3099027, SRR3099025,
SRR3099024, SRR3099022, SRR3098735, SRR3098734, SRR3098733, SRR3098732,
SRR3098731, SRR3098730, SRR3098729, SRR3098728, SRR3098727, SRR3098726,
SRR3098725, SRR3098724, SRR3098253, SRR3097992, SRR3097683, SRR3096888,
SRR3096651, SRR3096315, SRR3096312, SRR3096290, SRR3096289, SRR3096278,
SRR3096275, SRR3096274, SRR3096272, SRR3095832, SRR3095831, SRR3095830,
SRR3095829, SRR3095828, SRR3095827, SRR3095826, SRR3095793, SRR3095792,
SRR3095791, SRR3095790, SRR3095789, SRR3095788, SRR3095787, SRR3095786,
SRR3095785, SRR3095784, SRR3095783, SRR3095782, SRR3095761, SRR3095760,
SRR3095646, SRR3094513, SRR3091717, SRR3091548, SRR3091547, SRR3091540,
SRR3091511, SRR3091419, SRR3090746, SRR3090643, SRR3089988, SRR3089987,
SRR3089986, SRR3089985, SRR3089984, SRR3089983, SRR3089959, SRR3089958,
SRR3089957, SRR3089525, SRR3089487, SRR3089153, SRR3089152, SRR3089151,

SRR3089150, SRR3089149, SRR3089148, SRR3089147, SRR3089146, SRR3089145,
SRR3089144, SRR3089143, SRR3089142, SRR3088656, SRR3087932, SRR3087737,
SRR3087732, SRR3087718, SRR3087656, SRR3087655, SRR3087621, SRR3087415,
SRR3087372, SRR3087322, SRR3087313, SRR3087312, SRR3087311, SRR3087310,
SRR3087309, SRR3087308, SRR3087078, SRR3087030, SRR3087029, SRR3087028,
SRR3086980, SRR3086642, SRR3085237, SRR3085220, SRR3085219, SRR3085218,
SRR3085217, SRR3085216, SRR3085215, SRR3085212, SRR3085211, SRR3085210,
SRR3085207, SRR3085206, SRR3085205, SRR3085204, SRR3085203, SRR3085202,
SRR3084882, SRR3084866, SRR3084857, SRR3084851, SRR3084843, SRR3084838,
SRR3084837, SRR3084830, SRR3084824, SRR3084821, SRR3084818, SRR3084815,
SRR3084691, SRR3080062, SRR3080061, SRR3080060, SRR3080059, SRR3080058,
SRR3080057, SRR3080056, SRR3080055, SRR3080054, SRR3080053, SRR3080052,
SRR3080030, SRR3079977, SRR3079976, SRR3073710, SRR3069677, SRR3069676,
SRR3069659, SRR3069634, SRR3069632, SRR3069631, SRR3069520, SRR3069487,
SRR3069486, SRR3069446, SRR3069437, SRR3069411, SRR3068757, SRR3068756,
SRR3068755, SRR3068754, SRR3068482, SRR3068481, SRR3068477, SRR3068439,
SRR3068387, SRR3068377, SRR3068376, SRR3068375, SRR3068374, SRR3068373,
SRR3068372, SRR3068371, SRR3068370, SRR3068369, SRR3068368, SRR3068367,
SRR3068366, SRR3068360, SRR3068331, SRR3068321, SRR3068310, SRR3068294,
SRR3068246, SRR3064884, SRR3063529, SRR3063527, SRR3061577, SRR3061391,
SRR3056883, SRR3056882, SRR3046821, SRR3046820, SRR3046819, SRR3046818,
SRR3046817, SRR3046816, SRR3046815, SRR3046814, SRR3046813, SRR3046812,
SRR3046811, SRR3046810, SRR3046450, SRR3046449, SRR3046447, SRR3046446,
SRR3046445, SRR3046444, SRR3046443, SRR3046442, SRR3046441, SRR3046439,
SRR3046438, SRR3046437, SRR3046436, SRR3046435, SRR3046434, SRR3046427,
SRR3045991, SRR3045989, SRR3045988, SRR3045987, SRR3045982, SRR3045980,
SRR3039754, SRR3039753, SRR3039752, SRR3039751, SRR3039750, SRR3039749,
SRR3039748, SRR3035152, SRR3035151, SRR3032895, SRR3032894, SRR3032893,
SRR3032146, SRR3032145, SRR3032144, SRR3032143, SRR3032142, SRR3032141,
SRR3032140, SRR3032139, SRR3032138, SRR3032137, SRR3032136, SRR3032135,
SRR3032134, SRR3032133, SRR3032132, SRR3032131, SRR3032130, SRR3032129,
SRR3032128, SRR3032127, SRR3032126, SRR3032125, SRR3032124, SRR3032123,
SRR3032122, SRR3032121, SRR3032120, SRR3032119, SRR3032118, SRR3032117,
SRR3032116, SRR3032115, SRR3032114, SRR3032113, SRR3032112, SRR3032111,
SRR3032110, SRR3032109, SRR3032108, SRR3032107, SRR3032106, SRR3032105,
SRR3032104, SRR3032103, SRR3032102, SRR3032101, SRR3032100, SRR3032099,
SRR3032098, SRR3032097, SRR3032096, SRR3032095, SRR3032094, SRR3032093,
SRR3032092, SRR3032091, SRR3032090, SRR3032089, SRR3032088, SRR3032087,
SRR3032086, SRR3032085, SRR3032084, SRR3032083, SRR3032082, SRR3032081,
SRR3032080, SRR3032079, SRR3032078, SRR3032077, SRR3032076, SRR3032075,
SRR3032074, SRR3032073, SRR3032072, SRR3032071, SRR3032070, SRR3032069,
SRR3032068, SRR3032067, SRR3032066, SRR3032065, SRR3032064, SRR3032063,

SRR3032062, SRR3032061, SRR3032060, SRR3032059, SRR3032057, SRR3032055, SRR3032054, SRR3032052, SRR3032051, SRR3032050, SRR3032049, SRR3032025, SRR3032024, SRR3032023, SRR3032021, SRR3031987, SRR3031986, SRR3031984, SRR3031983, SRR3031982, SRR3031981, SRR3031980, SRR3031979, SRR3031978, SRR3031977, SRR3031976, SRR3031975, SRR3031974, SRR3031973, SRR3031972, SRR3031971, SRR3031970, SRR3031969, SRR3031968, SRR3031967, SRR3031966, SRR3031965, SRR3031964, SRR3031963, SRR3031962, SRR3031961, SRR3031960, SRR3031959, SRR3031956, SRR3031955, SRR3031954, SRR3031953, SRR3031952, SRR3031951, SRR3031950, SRR3031898, SRR3031894, SRR3031882, SRR3031101, SRR3027650, SRR3027649, SRR3027648, SRR3027647, SRR3027646, SRR3027645, SRR3027644, SRR3027643, SRR3027642, SRR3027641, SRR3027640, SRR3027639, SRR3027638, SRR3027637, SRR3027636, SRR3027635, SRR3027634, SRR3027633, SRR3027632, SRR3027631, SRR3027630, SRR3027629, SRR3027628, SRR3027627, SRR3027626, SRR3027625, SRR3027624, SRR3027623, SRR3027622, SRR3027621, SRR3027620, SRR3027619, SRR3027618, SRR3027601, SRR3027600, SRR3027598, SRR3027597, SRR3027595, SRR3027578, SRR3027576, SRR3027575, SRR3027574, SRR3027573, SRR3027572, SRR3027571, SRR3018829, SRR3003143, SRR3003142, SRR3003141, SRR3003140, SRR3003139, SRR3003138, SRR3003137, SRR3003136, SRR3003135, SRR3003134, SRR3003133, SRR3003132, SRR3003131, SRR3003130, SRR2996372, SRR2996371, SRR2996370, SRR2996369, SRR2993799, SRR2993798, SRR2993797, SRR2993796, SRR2993795, SRR2993794, SRR2993793, SRR2993792, SRR2993791, SRR2993790, SRR2993789, SRR2993788, SRR2993787, SRR2993786, SRR2993785, SRR2993784, SRR2993783, SRR2993782, SRR2993035, SRR2993034, SRR2993033, SRR2993032, SRR2992249, SRR2992210, SRR2989148, SRR2988083, SRR2988071, SRR2984946, SRR2984945, SRR2984944, SRR2984781, SRR2984601, SRR2984599, SRR2984598, SRR2984596, SRR2984595, SRR2984594, SRR2984591, SRR2984590, SRR2984589, SRR2984588, SRR2984587, SRR2984586, SRR2984585, SRR2984584, SRR2984583, SRR2984582, SRR2984580, SRR2984366, SRR2984365, SRR2984364, SRR2984363, SRR2984362, SRR2984361, SRR2984360, SRR2984359, SRR2984358, SRR2984357, SRR2984356, SRR2984354, SRR2984349, SRR2984348, SRR2984345, SRR2984344, SRR2983923, SRR2983922, SRR2983921, SRR2983920, SRR2983919, SRR2983918, SRR2983917, SRR2983916, SRR2983915, SRR2983914, SRR2983913, SRR2983912, SRR2983911, SRR2983910, SRR2983909, SRR2983908, SRR2983907, SRR2983906, SRR2983905, SRR2983904, SRR2983903, SRR2983902, SRR2983901, SRR2983900, SRR2983899, SRR2983898, SRR2983897, SRR2983896, SRR2983895, SRR2983894, SRR2983893, SRR2983892, SRR2983891, SRR2983890, SRR2983889, SRR2983888, SRR2983887, SRR2983886, SRR2983885, SRR2983884, SRR2983883, SRR2983882, SRR2983881, SRR2983880, SRR2983879, SRR2983878, SRR2983877, SRR2983876, SRR2983875, SRR2983874, SRR2983873, SRR2983872, SRR2983323, SRR2983322, SRR2983321, SRR2983320, SRR2983319, SRR2983318, SRR2983317, SRR2983315, SRR2983202, SRR2983201, SRR2983200, SRR2983199, SRR2983198, SRR2983197, SRR2983196, SRR2983195, SRR2983194, SRR2983192,

SRR2983190, SRR2983189, SRR2983187, SRR2983186, SRR2983185, SRR2983183,
SRR2983182, SRR2983179, SRR2983177, SRR2983176, SRR2983175, SRR2983174,
SRR2983172, SRR2983161, SRR2983160, SRR2983159, SRR2983158, SRR2983157,
SRR2983156, SRR2983155, SRR2983154, SRR2983153, SRR2983152, SRR2983151,
SRR2983150, SRR2983149, SRR2983148, SRR2983147, SRR2983146, SRR2982683,
SRR2982682, SRR2982551, SRR2982550, SRR2982549, SRR2982548, SRR2982547,
SRR2982546, SRR2980747, SRR2980745, SRR2980743, SRR2980742, SRR2980741,
SRR2980740, SRR2977529, SRR2976860, SRR2976859, SRR2976857, SRR2976856,
SRR2976855, SRR2976853, SRR2976852, SRR2976850, SRR2976848, SRR2976846,
SRR2976845, SRR2976829, SRR2976828, SRR2976604, SRR2976599, SRR2976598,
SRR2976597, SRR2976596, SRR2976595, SRR2976593, SRR2976522, SRR2976521,
SRR2976520, SRR2976519, SRR2976518, SRR2976517, SRR2976516, SRR2976515,
SRR2976514, SRR2976513, SRR2976512, SRR2976511, SRR2976261, SRR2976129,
SRR2976128, SRR2976093, SRR2976092, SRR2976091, SRR2976088, SRR2976065,
SRR2976062, SRR2976061, SRR2976060, SRR2976058, SRR2970908, SRR2970907,
SRR2970906, SRR2970905, SRR2970904, SRR2970903, SRR2967078, SRR2967077,
SRR2967076, SRR2967075, SRR2962728, SRR2962727, SRR2962726, SRR2962725,
SRR2962724, SRR2962723, SRR2962572, SRR2962497, SRR2962496, SRR2962495,
SRR2962494, SRR2962493, SRR2962491, SRR2962412, SRR2962411, SRR2961669,
SRR2961641, SRR2961640, SRR2961639, SRR2961638, SRR2961635, SRR2961632,
SRR2961613, SRR2960576, SRR2960575, SRR2960574, SRR2960555, SRR2960533,
SRR2960532, SRR2960531, SRR2960510, SRR2960487, SRR2960442, SRR2960404,
SRR2960403, SRR2960402, SRR2960401, SRR2960355, SRR2960354, SRR2960353,
SRR2960348, SRR2960347, SRR2960334, SRR2959979, SRR2959975, SRR2959972,
SRR2959968, SRR2959967, SRR2959966, SRR2959965, SRR2959951, SRR2959950,
SRR2959949, SRR2959891, SRR2959883, SRR2959783, SRR2959747, SRR2959746,
SRR2959745, SRR2959744, SRR2959743, SRR2959741, SRR2959739, SRR2959738,
SRR2959737, SRR2959736, SRR2959735, SRR2959734, SRR2959669, SRR2959668,
SRR2959667, SRR2959664, SRR2959663, SRR2959662, SRR2959455, SRR2959424,
SRR2959420, SRR2959419, SRR2959418, SRR2959417, SRR2959416, SRR2959414,
SRR2959413, SRR2959411, SRR2959410, SRR2959409, SRR2959322, SRR2959321,
SRR2959319, SRR2959318, SRR2959317, SRR2959316, SRR2955022, SRR2955021,
SRR2955020, SRR2954869, SRR2954865, SRR2954854, SRR2954852, SRR2954851,
SRR2954850, SRR2954846, SRR2954845, SRR2954844, SRR2954843, SRR2954813,
SRR2954812, SRR2954811, SRR2954808, SRR2954807, SRR2954806, SRR2954756,
SRR2954755, SRR2954754, SRR2954753, SRR2954752, SRR2954751, SRR2954750,
SRR2954749, SRR2954748, SRR2954747, SRR2954746, SRR2954745, SRR2954744,
SRR2954743, SRR2954742, SRR2954741, SRR2954740, SRR2954739, SRR2954738,
SRR2954737, SRR2954736, SRR2954735, SRR2954734, SRR2954733, SRR2954691,
SRR2954690, SRR2954687, SRR2954323, SRR2954318, SRR2954249, SRR2953701,
SRR2952884, SRR2952883, SRR2952882, SRR2952881, SRR2952880, SRR2952879,
SRR2952878, SRR2952877, SRR2952876, SRR2952875, SRR2952874, SRR2952873,

SRR2931102, SRR2931101, SRR2931100, SRR2931099, SRR2931098, SRR2931097,
SRR2931096, SRR2931095, SRR2931094, SRR2931093, SRR2931092, SRR2931091,
SRR2931090, SRR2931089, SRR2931088, SRR2931087, SRR2931086, SRR2931085,
SRR2931084, SRR2931083, SRR2931082, SRR2931081, SRR2931080, SRR2931079,
SRR2931078, SRR2931077, SRR2931076, SRR2931075, SRR2931074, SRR2931073,
SRR2931072, SRR2931071, SRR2931070, SRR2931069, SRR2931068, SRR2931067,
SRR2931066, SRR2931065, SRR2931064, SRR2931063, SRR2931062, SRR2931061,
SRR2931060, SRR2931059, SRR2931058, SRR2931057, SRR2931056, SRR2931055,
SRR2931054, SRR2931053, SRR2931052, SRR2931051, SRR2931050, SRR2931049,
SRR2931048, SRR2931047, SRR2931046, SRR2931045, SRR2931044, SRR2931043,
SRR2931042, SRR2931041, SRR2931040, SRR2927368, SRR2927367, SRR2927366,
SRR2927365, SRR2927364, SRR2927363, SRR2927362, SRR2927361, SRR2927360,
SRR2927359, SRR2927358, SRR2927357, SRR2927356, SRR2927355, SRR2927354,
SRR2927353, SRR2927352, SRR2927351, SRR2927350, SRR2927349, SRR2927348,
SRR2927347, SRR2927346, SRR2927345, SRR2927344, SRR2927343, SRR2927342,
SRR2927341, SRR2927340, SRR2927339, SRR2927338, SRR2927337, SRR2927336,
SRR2927335, SRR2927334, SRR2927333, SRR2927332, SRR2927331, SRR2927330,
SRR2927329, SRR2927328, SRR2925763, SRR2925762, SRR2925761, SRR2925760,
SRR2925759, SRR2925758, SRR2925757, SRR2925756, SRR2925755, SRR2925754,
SRR2925753, SRR2925752, SRR2925751, SRR2925750, SRR2925749, SRR2925748,
SRR2925747, SRR2925746, SRR2925745, SRR2925744, SRR2925743, SRR2925742,
SRR2925741, SRR2925740, SRR2925739, SRR2925738, SRR2925737, SRR2925736,
SRR2925735, SRR2925734, SRR2925733, SRR2925732, SRR2925731, SRR2925730,
SRR2925729, SRR2925728, SRR2925727, SRR2925726, SRR2925725, SRR2925724,
SRR2925723, SRR2925722, SRR2925721, SRR2925720, SRR2925719, SRR2925718,
SRR2925717, SRR2925716, SRR2925715, SRR2925714, SRR2925713, SRR2925712,
SRR2925711, SRR2925710, SRR2925709, SRR2925708, SRR2925707, SRR2925706,
SRR2925705, SRR2925704, SRR2925703, SRR2925702, SRR2924937, SRR2924936,
SRR2924934, SRR2924933, SRR2924925, SRR2924923, SRR2924921, SRR2924919,
SRR2924904, SRR2924890, SRR2924133, SRR2924132, SRR2924131, SRR2924129,
SRR2924128, SRR2924127, SRR2923844, SRR2923843, SRR2923842, SRR2923841,
SRR2923834, SRR2923830, SRR2923817, SRR2923343, SRR2922630, SRR2922629,
SRR2922628, SRR2922627, SRR2922626, SRR2922625, SRR2919276, SRR2919176,
SRR2918612, SRR2918610, SRR2918606, SRR2917880, SRR2917879, SRR2917866,
SRR2917848, SRR2917618, SRR2913257, SRR2913255, SRR2913253, SRR2913240,
SRR2913239, SRR2913238, SRR2913229, SRR2913227, SRR2913201, SRR2913200,
SRR2913199, SRR2913197, SRR2913184, SRR2913047, SRR2913022, SRR2913021,
SRR2913020, SRR2913019, SRR2913016, SRR2913015, SRR2913002, SRR2912999,
SRR2912997, SRR2912994, SRR2912990, SRR2912987, SRR2912986, SRR2912983,
SRR2912978, SRR2912971, SRR2912899, SRR2912894, SRR2912893, SRR2912891,
SRR2912853, SRR2912848, SRR2912846, SRR2912682, SRR2912681, SRR2912680,
SRR2912679, SRR2912678, SRR2912677, SRR2912676, SRR2912675, SRR2912587,

SRR2912586, SRR2912585, SRR2912584, SRR2912583, SRR2912582, SRR2912198,
SRR2912197, SRR2912196, SRR2912195, SRR2912194, SRR2912193, SRR2912192,
SRR2912191, SRR2912190, SRR2912189, SRR2912188, SRR2912185, SRR2911364,
SRR2911361, SRR2911360, SRR2911289, SRR2911288, SRR2911287, SRR2911075,
SRR2911073, SRR2911071, SRR2908044, SRR2908043, SRR2908042, SRR2908041,
SRR2908040, SRR2907733, SRR2906965, SRR2906962, SRR2906960, SRR2906958,
SRR2906955, SRR2906952, SRR2906950, SRR2906948, SRR2906946, SRR2906944,
SRR2906942, SRR2906939, SRR2906937, SRR2906935, SRR2906931, SRR2906929,
SRR2906909, SRR2906898, SRR2906895, SRR2906893, SRR2906891, SRR2906889,
SRR2906885, SRR2906882, SRR2906877, SRR2906850, SRR2906848, SRR2906843,
SRR2906839, SRR2906815, SRR2906811, SRR2899677, SRR2899654, SRR2899653,
SRR2899634, SRR2899633, SRR2899632, SRR2899631, SRR2899630, SRR2899629,
SRR2899628, SRR2899627, SRR2899626, SRR2899625, SRR2899624, SRR2899603,
SRR2899588, SRR2899580, SRR2899578, SRR2898688, SRR2898687, SRR2898684,
SRR2898682, SRR2895761, SRR2895686, SRR2895685, SRR2895627, SRR2895388,
SRR2890267, SRR2890266, SRR2890264, SRR2890263, SRR2890262, SRR2890261,
SRR2890260, SRR2890258, SRR2890239, SRR2890187, SRR2889759, SRR2889754,
SRR2889701, SRR2889700, SRR2889699, SRR2889698, SRR2889697, SRR2889256,
SRR2889255, SRR2889253, SRR2889252, SRR2889250, SRR2889249, SRR2889248,
SRR2889247, SRR2887588, SRR2887561, SRR2887560, SRR2887559, SRR2887148,
SRR2887147, SRR2887146, SRR2887145, SRR2887144, SRR2887143, SRR2886972,
SRR2886971, SRR2886970, SRR2886969, SRR2886968, SRR2886966, SRR2886963,
SRR2886960, SRR2886954, SRR2886951, SRR2886949, SRR2886948, SRR2886947,
SRR2886943, SRR2886942, SRR2886899, SRR2879664, SRR2879349, SRR2879348,
SRR2879347, SRR2879339, SRR2879328, SRR2879322, SRR2879321, SRR2879320,
SRR2879319, SRR2879318, SRR2879317, SRR2879316, SRR2879315, SRR2879314,
SRR2879313, SRR2879312, SRR2879311, SRR2879310, SRR2879309, SRR2879308,
SRR2879307, SRR2879306, SRR2879305, SRR2879304, SRR2879303, SRR2879302,
SRR2879301, SRR2879300, SRR2879299, SRR2879298, SRR2879297, SRR2879296,
SRR2879295, SRR2879294, SRR2879293, SRR2879292, SRR2879291, SRR2879290,
SRR2879289, SRR2879288, SRR2879287, SRR2879286, SRR2879285, SRR2879284,
SRR2879283, SRR2876083, SRR2876082, SRR2876081, SRR2876080, SRR2874980,
SRR2874498, SRR2874476, SRR2873751, SRR2873732, SRR2872256, SRR2866533,
SRR2866512, SRR2866506, SRR2866060, SRR2864836, SRR2861507, SRR2861506,
SRR2861505, SRR2861501, SRR2861499, SRR2861498, SRR2861497, SRR2861496,
SRR2861436, SRR2861376, SRR2861282, SRR2861008, SRR2860969, SRR2860906,
SRR2860847, SRR2860670, SRR2860642, SRR2860641, SRR2860640, SRR2860639,
SRR2860638, SRR2860637, SRR2860636, SRR2860635, SRR2859960, SRR2859959,
SRR2859958, SRR2859957, SRR2859956, SRR2859955, SRR2859954, SRR2859953,
SRR2859952, SRR2859951, SRR2859950, SRR2859949, SRR2859948, SRR2859947,
SRR2859946, SRR2859945, SRR2859944, SRR2859943, SRR2859942, SRR2859941,
SRR2859940, SRR2859939, SRR2859938, SRR2859937, SRR2859936, SRR2859935,

SRR2859934, SRR2859933, SRR2859932, SRR2859931, SRR2859930, SRR2859929,
SRR2859928, SRR2859927, SRR2859926, SRR2859925, SRR2859924, SRR2859923,
SRR2859922, SRR2859921, SRR2859920, SRR2859919, SRR2859918, SRR2859917,
SRR2859916, SRR2859915, SRR2859914, SRR2859913, SRR2859912, SRR2859911,
SRR2859910, SRR2859909, SRR2859908, SRR2859907, SRR2859906, SRR2859905,
SRR2859904, SRR2859903, SRR2859902, SRR2859901, SRR2859900, SRR2859899,
SRR2859898, SRR2859897, SRR2859896, SRR2859895, SRR2859894, SRR2859893,
SRR2859892, SRR2859891, SRR2859890, SRR2859889, SRR2859888, SRR2859887,
SRR2859886, SRR2859885, SRR2859884, SRR2859883, SRR2859882, SRR2859881,
SRR2859880, SRR2859879, SRR2859878, SRR2859877, SRR2859876, SRR2859875,
SRR2859874, SRR2859873, SRR2859872, SRR2859871, SRR2859870, SRR2859869,
SRR2859868, SRR2859867, SRR2859866, SRR2859865, SRR2859864, SRR2859863,
SRR2859862, SRR2859861, SRR2859860, SRR2859859, SRR2859858, SRR2859857,
SRR2859856, SRR2859855, SRR2859854, SRR2859853, SRR2859852, SRR2859851,
SRR2859850, SRR2859849, SRR2859848, SRR2859847, SRR2859846, SRR2859845,
SRR2859844, SRR2859843, SRR2859842, SRR2859841, SRR2859840, SRR2859839,
SRR2859838, SRR2859837, SRR2859836, SRR2859835, SRR2859834, SRR2859833,
SRR2859832, SRR2859831, SRR2859830, SRR2859829, SRR2859828, SRR2859827,
SRR2859826, SRR2859825, SRR2859824, SRR2859823, SRR2859822, SRR2859821,
SRR2859820, SRR2859819, SRR2859818, SRR2859817, SRR2859816, SRR2859815,
SRR2859814, SRR2859813, SRR2859812, SRR2859811, SRR2859810, SRR2859809,
SRR2859808, SRR2859807, SRR2859806, SRR2859805, SRR2859804, SRR2859803,
SRR2859802, SRR2859801, SRR2854735, SRR2854734, SRR2854733, SRR2850600,
SRR2850599, SRR2850598, SRR2850597, SRR2850596, SRR2850595, SRR2850594,
SRR2850593, SRR2850592, SRR2850591, SRR2850590, SRR2850589, SRR2850588,
SRR2850587, SRR2850586, SRR2850585, SRR2850584, SRR2850583, SRR2850582,
SRR2850581, SRR2850580, SRR2850579, SRR2850578, SRR2850577, SRR2850576,
SRR2850575, SRR2850574, SRR2850573, SRR2850572, SRR2850571, SRR2845695,
SRR2845694, SRR2845693, SRR2845691, SRR2831417, SRR2831416, SRR2831415,
SRR2831414, SRR2831413, SRR2831412, SRR2831411, SRR2831410, SRR2831409,
SRR2831408, SRR2831407, SRR2831406, SRR2831405, SRR2831404, SRR2831403,
SRR2831402, SRR2831401, SRR2831400, SRR2831399, SRR2831398, SRR2831397,
SRR2831396, SRR2831395, SRR2831394, SRR2831393, SRR2831392, SRR2831391,
SRR2831390, SRR2831389, SRR2831388, SRR2831387, SRR2831386, SRR2831385,
SRR2831384, SRR2831383, SRR2831382, SRR2831381, SRR2831380, SRR2831379,
SRR2831378, SRR2831377, SRR2831376, SRR2831375, SRR2831374, SRR2831373,
SRR2831372, SRR2831371, SRR2831370, SRR2831369, SRR2831368, SRR2831367,
SRR2831366, SRR2831365, SRR2831364, SRR2831363, SRR2831362, SRR2831361,
SRR2831360, SRR2831359, SRR2831358, SRR2831357, SRR2831356, SRR2831355,
SRR2831354, SRR2831353, SRR2831352, SRR2831351, SRR2831350, SRR2831349,
SRR2828732, SRR2828731, SRR2828730, SRR2828729, SRR2828728, SRR2828727,
SRR2828726, SRR2828725, SRR2828724, SRR2828723, SRR2828722, SRR2828721,

SRR2824358, SRR2824357, SRR2824355, SRR2814814, SRR2812540, SRR2807656,
SRR2807655, SRR2807654, SRR2807653, SRR2807651, SRR2807650, SRR2807649,
SRR2807648, SRR2807644, SRR2807643, SRR2807641, SRR2807640, SRR2807639,
SRR2807638, SRR2807637, SRR2807636, SRR2807635, SRR2807634, SRR2807633,
SRR2807632, SRR2807631, SRR2807629, SRR2807628, SRR2807627, SRR2807625,
SRR2807624, SRR2807623, SRR2807622, SRR2807621, SRR2787827, SRR2787826,
SRR2787825, SRR2787824, SRR2787823, SRR2787822, SRR2787821, SRR2787820,
SRR2787819, SRR2787818, SRR2787817, SRR2787816, SRR2787815, SRR2787814,
SRR2787813, SRR2787812, SRR2787811, SRR2787810, SRR2787722, SRR2787578,
SRR2787501, SRR2787320, SRR2787261, SRR2787260, SRR2782692, SRR2782691,
SRR2782690, SRR2782581, SRR2782513, SRR2782462, SRR2782438, SRR2782419,
SRR2782418, SRR2782417, SRR2782416, SRR2782415, SRR2782414, SRR2782413,
SRR2782412, SRR2782411, SRR2782410, SRR2782409, SRR2782408, SRR2781847,
SRR2781391, SRR2763389, SRR2757549, SRR2757327, SRR2750421, SRR2750135,
SRR2745306, SRR2745305, SRR2745304, SRR2745303, SRR2745302, SRR2745301,
SRR2745300, SRR2745299, SRR2745298, SRR2745297, SRR2745296, SRR2745295,
SRR2731356, SRR2731355, SRR2730694, SRR2730693, SRR2730305, SRR2730141,
SRR2729493, SRR2716350, SRR2677523, SRR2677522, SRR2677296, SRR2676904,
SRR2658742, SRR2658736, SRR2658729, SRR2658710, SRR2658705, SRR2658698,
SRR2658681, SRR2658678, SRR2658676, SRR2658643, SRR2658641, SRR2658640,
SRR2658639, SRR2658638, SRR2658637, SRR2657154, SRR2657153, SRR2657152,
SRR2657151, SRR2657150, SRR2657149, SRR2657148, SRR2657147, SRR2649900,
SRR2646855, SRR2646854, SRR2646853, SRR2646852, SRR2646309, SRR2646308,
SRR2646307, SRR2646306, SRR2646303, SRR2646302, SRR2646301, SRR2646300,
SRR2646299, SRR2646298, SRR2641131, SRR2641130, SRR2641129, SRR2641128,
SRR2641127, SRR2641126, SRR2641125, SRR2641124, SRR2641123, SRR2641066,
SRR2641065, SRR2641044, SRR2640969, SRR2640949, SRR2640881, SRR2640709,
SRR2640708, SRR2640654, SRR2636952, SRR2636944, SRR2636943, SRR2636942,
SRR2636941, SRR2636940, SRR2636939, SRR2636938, SRR2636937, SRR2636936,
SRR2636935, SRR2636934, SRR2636933, SRR2636931, SRR2636930, SRR2636929,
SRR2627462, SRR2627460, SRR2627459, SRR2627458, SRR2627456, SRR2627455,
SRR2627454, SRR2627453, SRR2627452, SRR2627106, SRR2627103, SRR2627099,
SRR2602748, SRR2602747, SRR2602746, SRR2586143, SRR2586142, SRR2586141,
SRR2586140, SRR2586139, SRR2586138, SRR2586137, SRR2586136, SRR2586131,
SRR2584370, SRR2584369, SRR2584352, SRR2584351, SRR2584349, SRR2584347,
SRR2584341, SRR2584319, SRR2584304, SRR2559272, SRR2559271, SRR2559270,
SRR2559269, SRR2559268, SRR2559267, SRR2559266, SRR2559265, SRR2559264,
SRR2559263, SRR2559262, SRR2559261, SRR2559260, SRR2559258, SRR2558689,
SRR2558687, SRR2558686, SRR2558685, SRR2558684, SRR2558683, SRR2558682,
SRR2558681, SRR2558679, SRR2558678, SRR2558677, SRR2558675, SRR2545598,
SRR2545597, SRR2545596, SRR2545595, SRR2545594, SRR2545593, SRR2545592,
SRR2545591, SRR2545590, SRR2545589, SRR2545588, SRR2545587, SRR2545586,

SRR2518104, SRR2518098, SRR2518089, SRR2518075, SRR2517689, SRR2517688,
SRR2505479, SRR2505433, SRR2505408, SRR2505369, SRR2500948, SRR2500947,
SRR2500946, SRR2500945, SRR2500944, SRR2487730, SRR2481856, SRR2481855,
SRR2481854, SRR2481853, SRR2481852, SRR2481851, SRR2478947, SRR2478946,
SRR2478945, SRR2478944, SRR2477710, SRR2467255, SRR2467254, SRR2467253,
SRR2467252, SRR2456796, SRR2456795, SRR2456794, SRR2456793, SRR2456792,
SRR2456791, SRR2456790, SRR2456789, SRR2456788, SRR2456787, SRR2456786,
SRR2456785, SRR2456784, SRR2456783, SRR2454827, SRR2452637, SRR2452636,
SRR2452635, SRR2452634, SRR2452633, SRR2452632, SRR2452631, SRR2452630,
SRR2452629, SRR2452628, SRR2452627, SRR2452626, SRR2452625, SRR2452624,
SRR2452623, SRR2452622, SRR2452621, SRR2452620, SRR2452619, SRR2452618,
SRR2452617, SRR2452616, SRR2452615, SRR2452614, SRR2452613, SRR2452612,
SRR2452611, SRR2452610, SRR2452609, SRR2452608, SRR2452607, SRR2452606,
SRR2452605, SRR2452604, SRR2452603, SRR2452602, SRR2452601, SRR2452600,
SRR2452599, SRR2452598, SRR2452597, SRR2452596, SRR2452595, SRR2452594,
SRR2452593, SRR2452592, SRR2452591, SRR2452590, SRR2452589, SRR2452588,
SRR2452587, SRR2452586, SRR2452585, SRR2452584, SRR2452583, SRR2452582,
SRR2452581, SRR2452580, SRR2452579, SRR2452578, SRR2452577, SRR2452576,
SRR2452575, SRR2452574, SRR2452573, SRR2452572, SRR2452571, SRR2452570,
SRR2452569, SRR2452568, SRR2452567, SRR2452566, SRR2452565, SRR2452564,
SRR2452563, SRR2452562, SRR2452561, SRR2452560, SRR2452559, SRR2452558,
SRR2452557, SRR2452556, SRR2452555, SRR2452554, SRR2452553, SRR2452552,
SRR2452551, SRR2452550, SRR2452549, SRR2452548, SRR2452547, SRR2452546,
SRR2452545, SRR2452544, SRR2452543, SRR2452542, SRR2452541, SRR2452540,
SRR2452539, SRR2452538, SRR2452537, SRR2452536, SRR2452535, SRR2452534,
SRR2452533, SRR2452532, SRR2452531, SRR2452530, SRR2452529, SRR2452528,
SRR2452527, SRR2452526, SRR2452525, SRR2443267, SRR2443266, SRR2443265,
SRR2443264, SRR2416235, SRR2414434, SRR2414433, SRR2414432, SRR2414431,
SRR2414430, SRR2414429, SRR2414428, SRR2414427, SRR2414426, SRR2414425,
SRR2414424, SRR2414423, SRR2414422, SRR2414421, SRR2414420, SRR2414419,
SRR2409708, SRR2405593, SRR2405539, SRR2405440, SRR2405343, SRR2401466,
SRR2396414, SRR2396389, SRR2396388, SRR2396387, SRR2396358, SRR2396332,
SRR2396324, SRR2396323, SRR2396322, SRR2396321, SRR2396289, SRR2396288,
SRR2396257, SRR2396256, SRR2396255, SRR2396254, SRR2396233, SRR2396214,
SRR2396193, SRR2396162, SRR2396161, SRR2396160, SRR2396144, SRR2396137,
SRR2396106, SRR2396105, SRR2396104, SRR2396103, SRR2396102, SRR2396101,
SRR2396100, SRR2396065, SRR2396014, SRR2396012, SRR2396011, SRR2396010,
SRR2396004, SRR2395987, SRR2395956, SRR2395934, SRR2393726, SRR2391665,
SRR2391664, SRR2391663, SRR2391662, SRR2391661, SRR2391660, SRR2391659,
SRR2391658, SRR2380116, SRR2380049, SRR2380048, SRR2379972, SRR2379950,
SRR2379887, SRR2379664, SRR2379602, SRR2379577, SRR2379446, SRR2379445,
SRR2379393, SRR2379274, SRR2379209, SRR2379177, SRR2356969, SRR2356968,

SRR2356942, SRR2356941, SRR2356939, SRR2356927, SRR2356916, SRR2356914, SRR2356907, SRR2356905, SRR2356900, SRR2356898, SRR2347332, SRR2340593, SRR2340592, SRR2340591, SRR2340590, SRR2340589, SRR2340588, SRR2340587, SRR2340586, SRR2340585, SRR2340584, SRR2340583, SRR2340582, SRR2340581, SRR2340580, SRR2340579, SRR2340578, SRR2340577, SRR2340576, SRR2340575, SRR2340574, SRR2340573, SRR2340572, SRR2340571, SRR2338869, SRR2338868, SRR2338867, SRR2338866, SRR2321388, SRR2321387, SRR2321386, SRR2321385, SRR2321384, SRR2321383, SRR2321319, SRR2321318, SRR2321313, SRR2321312, SRR2321311, SRR2321294, SRR2321291, SRR2321289, SRR2321257, SRR2321216, SRR2321164, SRR2321046, SRR2320953, SRR2320902, SRR2320802, SRR2320770, SRR2320708, SRR2320612, SRR2320504, SRR2320476, SRR2319666, SRR2309655, SRR2309653, SRR2309652, SRR2309651, SRR2309636, SRR2306560, SRR2306559, SRR2306558, SRR2306557, SRR2306556, SRR2306555, SRR2306554, SRR2306553, SRR2306552, SRR2306551, SRR2306550, SRR2306549, SRR2306548, SRR2306547, SRR2306546, SRR2306545, SRR2297228, SRR2297227, SRR2296855, SRR2296854, SRR2296836, SRR2296835, SRR2296834, SRR2296833, SRR2296832, SRR2296831, SRR2296830, SRR2296829, SRR2290965, SRR2290964, SRR2290963, SRR2290958, SRR2290955, SRR2290954, SRR2290952, SRR2290951, SRR2290949, SRR2289250, SRR2285521, SRR2285520, SRR2254914, SRR2242888, SRR2242887, SRR2242886, SRR2240286, SRR2240285, SRR2240284, SRR2240283, SRR2240282, SRR2240281, SRR2240280, SRR2240279, SRR2240278, SRR2240277, SRR2240276, SRR2240275, SRR2240274, SRR2240271, SRR2240270, SRR2240269, SRR2240268, SRR2240267, SRR2240266, SRR2240265, SRR2240264, SRR2240263, SRR2240262, SRR2239886, SRR2239885, SRR2239884, SRR2239883, SRR2239882, SRR2239881, SRR2239777, SRR2239775, SRR2239771, SRR2239767, SRR2239761, SRR2239721, SRR2239651, SRR2239112, SRR2231371, SRR2231034, SRR2231033, SRR2231030, SRR2231029, SRR2230100, SRR2229278, SRR2229234, SRR2229233, SRR2229231, SRR2229230, SRR2229229, SRR2229228, SRR2229227, SRR2229194, SRR2229193, SRR2229192, SRR2227286, SRR2227285, SRR2227284, SRR2225308, SRR2225306, SRR2225305, SRR2225304, SRR2225302, SRR2225301, SRR2225300, SRR2225299, SRR2225298, SRR2225297, SRR2221856, SRR2221855, SRR2221854, SRR2221853, SRR2221852, SRR2221851, SRR2221850, SRR2221849, SRR2221848, SRR2221847, SRR2221846, SRR2221845, SRR2221844, SRR2221843, SRR2221842, SRR2221841, SRR2221840, SRR2221839, SRR2221838, SRR2221837, SRR2221836, SRR2221835, SRR2221834, SRR2221833, SRR2219516, SRR2219515, SRR2219514, SRR2219513, SRR2219512, SRR2219511, SRR2219510, SRR2219509, SRR2219508, SRR2219507, SRR2211116, SRR2211115, SRR2207945, SRR2207895, SRR2192463, SRR2192462, SRR2192461, SRR2191769, SRR2191768, SRR2191767, SRR2191766, SRR2191763, SRR2191762, SRR2191704, SRR2191703, SRR2189233, SRR2187613, SRR2187612, SRR2187611, SRR2187610, SRR2187609, SRR2187608, SRR2187607, SRR2187606, SRR2187605, SRR2187604, SRR2187596, SRR2187595, SRR2187594, SRR2187593, SRR2187592, SRR2187591, SRR2187574, SRR2187573, SRR2187572, SRR2187571, SRR2187112,

SRR2187111, SRR2187110, SRR2187109, SRR2186966, SRR2186964, SRR2186962, SRR2186960, SRR2186958, SRR2186956, SRR2186954, SRR2186952, SRR2186950, SRR2186948, SRR2186946, SRR2186944, SRR2186942, SRR2186940, SRR2186938, SRR2186936, SRR2186934, SRR2186932, SRR2186930, SRR2186928, SRR2186894, SRR2186744, SRR2186725, SRR2186709, SRR2186622, SRR2186621, SRR2186620, SRR2183535, SRR2183534, SRR2183533, SRR2183397, SRR2183396, SRR2183395, SRR2183394, SRR2183393, SRR2183392, SRR2182164, SRR2182163, SRR2182162, SRR2182161, SRR2180101, SRR2180100, SRR2179938, SRR2177940, SRR2177939, SRR2177938, SRR2177556, SRR2177555, SRR2177554, SRR2177553, SRR2177552, SRR2177551, SRR2177550, SRR2177549, SRR2177548, SRR2177547, SRR2177546, SRR2177545, SRR2177458, SRR2177455, SRR2177450, SRR2177449, SRR2177448, SRR2177446, SRR2175825, SRR2175744, SRR2175743, SRR2175742, SRR2175741, SRR2175740, SRR2175739, SRR2175738, SRR2175737, SRR2175736, SRR2175735, SRR2175734, SRR2175733, SRR2175732, SRR2175731, SRR2175730, SRR2175729, SRR2171887, SRR2171886, SRR2171885, SRR2171884, SRR2171882, SRR2171881, SRR2171880, SRR2170970, SRR2170964, SRR2170770, SRR2170769, SRR2170768, SRR2170767, SRR2170766, SRR2170765, SRR2170764, SRR2170691, SRR2170688, SRR2167619, SRR2165756, SRR2164323, SRR2164322, SRR2164321, SRR2164319, SRR2164318, SRR2164232, SRR2163790, SRR2163406, SRR2163405, SRR2163404, SRR2163403, SRR2163402, SRR2163235, SRR2163234, SRR2163233, SRR2163232, SRR2163230, SRR2163052, SRR2163050, SRR2163049, SRR2163048, SRR2163047, SRR2163046, SRR2163045, SRR2163041, SRR2163037, SRR2163021, SRR2162962, SRR2162953, SRR2162944, SRR2162929, SRR2162919, SRR2162908, SRR2162889, SRR2162878, SRR2162836, SRR2162785, SRR2159471, SRR2157753, SRR2157752, SRR2157751, SRR2157750, SRR2157749, SRR2157748, SRR2157747, SRR2157746, SRR2157745, SRR2157744, SRR2157179, SRR2156992, SRR2156988, SRR2156315, SRR2156314, SRR2156312, SRR2156309, SRR2156307, SRR2156305, SRR2155692, SRR2155691, SRR2155690, SRR2155689, SRR2155688, SRR2155687, SRR2155561, SRR2155406, SRR2155405, SRR2155404, SRR2155403, SRR2155402, SRR2155401, SRR2155400, SRR2155399, SRR2155398, SRR2155397, SRR2154849, SRR2154848, SRR2154846, SRR2154845, SRR2154844, SRR2154843, SRR2154842, SRR2154841, SRR2154840, SRR2154839, SRR2154837, SRR2154836, SRR2154835, SRR2154834, SRR2154833, SRR2154832, SRR2154831, SRR2154830, SRR2154829, SRR2154828, SRR2154526, SRR2154525, SRR2154524, SRR2154523, SRR2154522, SRR2154521, SRR2154520, SRR2154360, SRR2154359, SRR2154358, SRR2154356, SRR2154355, SRR2154354, SRR2154352, SRR2154333, SRR2154332, SRR2154330, SRR2154328, SRR2154327, SRR2153899, SRR2153898, SRR2153897, SRR2153538, SRR2153529, SRR2153288, SRR2153285, SRR2149843, SRR2149842, SRR2149841, SRR2149840, SRR2149839, SRR2149838, SRR2149837, SRR2149836, SRR2149835, SRR2149834, SRR2149833, SRR2148999, SRR2148998, SRR2148996, SRR2148994, SRR2148993, SRR2148992, SRR2148991, SRR2148990, SRR2148989, SRR2148988, SRR2148987, SRR2148986, SRR2148985, SRR2148984, SRR2148983, SRR2148982, SRR2148981,

SRR2148980, SRR2148979, SRR2147994, SRR2147993, SRR2147992, SRR2147991,
SRR2147990, SRR2147203, SRR2147202, SRR2147201, SRR2147200, SRR2147199,
SRR2147198, SRR2147197, SRR2147196, SRR2147195, SRR2147194, SRR2147193,
SRR2147192, SRR2147191, SRR2147190, SRR2147189, SRR2147188, SRR2147187,
SRR2147186, SRR2147074, SRR2147073, SRR2147072, SRR2146953, SRR2146287,
SRR2146286, SRR2146285, SRR2146284, SRR2145149, SRR2144475, SRR2144474,
SRR2144473, SRR2144472, SRR2144471, SRR2144470, SRR2144469, SRR2144468,
SRR2144467, SRR2144466, SRR2144465, SRR2144464, SRR2144463, SRR2144462,
SRR2144461, SRR2144460, SRR2144459, SRR2144458, SRR2144457, SRR2144456,
SRR2144455, SRR2144454, SRR2144453, SRR2144452, SRR2144451, SRR2144450,
SRR2144449, SRR2144448, SRR2144447, SRR2144446, SRR2144445, SRR2144444,
SRR2144443, SRR2144442, SRR2144441, SRR2144440, SRR2144439, SRR2144438,
SRR2144437, SRR2144436, SRR2144435, SRR2144434, SRR2144433, SRR2144432,
SRR2144431, SRR2144430, SRR2144429, SRR2144428, SRR2144427, SRR2144426,
SRR2144425, SRR2144424, SRR2144423, SRR2144422, SRR2144421, SRR2144420,
SRR2144419, SRR2144418, SRR2144417, SRR2144416, SRR2144415, SRR2144414,
SRR2144413, SRR2144412, SRR2144411, SRR2144410, SRR2144409, SRR2144408,
SRR2144407, SRR2144406, SRR2144405, SRR2144404, SRR2144403, SRR2144402,
SRR2144401, SRR2144400, SRR2144399, SRR2144398, SRR2144397, SRR2144396,
SRR2144395, SRR2144394, SRR2144393, SRR2144392, SRR2144391, SRR2144390,
SRR2144389, SRR2144388, SRR2144387, SRR2144386, SRR2144385, SRR2144384,
SRR2144383, SRR2144382, SRR2142289, SRR2142288, SRR2142287, SRR2142286,
SRR2142007, SRR2142006, SRR2141369, SRR2141368, SRR2141367, SRR2141366,
SRR2141365, SRR2141364, SRR2141363, SRR2141362, SRR2141361, SRR2141360,
SRR2141359, SRR2141358, SRR2141357, SRR2141356, SRR2141355, SRR2141354,
SRR2141353, SRR2141352, SRR2141351, SRR2141350, SRR2141349, SRR2141348,
SRR2141347, SRR2141346, SRR2141345, SRR2141344, SRR2141343, SRR2141342,
SRR2141341, SRR2141340, SRR2141339, SRR2141338, SRR2141337, SRR2141336,
SRR2141335, SRR2141334, SRR2141333, SRR2141332, SRR2141331, SRR2141330,
SRR2141329, SRR2141328, SRR2141327, SRR2141326, SRR2141325, SRR2141316,
SRR2141315, SRR2141314, SRR2141306, SRR2141305, SRR2141304, SRR2141303,
SRR2141302, SRR2141300, SRR2141298, SRR2141297, SRR2141296, SRR2141295,
SRR2141294, SRR2141293, SRR2141292, SRR2141291, SRR2141290, SRR2141289,
SRR2141288, SRR2141287, SRR2141286, SRR2141285, SRR2141284, SRR2141283,
SRR2141282, SRR2141281, SRR2141280, SRR2141279, SRR2141278, SRR2141277,
SRR2141276, SRR2141275, SRR2141274, SRR2141273, SRR2141272, SRR2141271,
SRR2141270, SRR2141269, SRR2141268, SRR2141267, SRR2141266, SRR2141265,
SRR2141264, SRR2141263, SRR2141262, SRR2141260, SRR2141198, SRR2140756,
SRR2140755, SRR2140598, SRR2138581, SRR2136640, SRR2136639, SRR2136638,
SRR2136637, SRR2135661, SRR2135660, SRR2135659, SRR2135658, SRR2135657,
SRR2135656, SRR2135042, SRR2134367, SRR2134277, SRR2134236, SRR2132844,
SRR2132843, SRR2132842, SRR2132799, SRR2132798, SRR2132797, SRR2132617,

SRR2132616, SRR2132457, SRR2132456, SRR2132455, SRR2132454, SRR2132453, SRR2132452, SRR2132451, SRR2132450, SRR2132449, SRR2132448, SRR2132447, SRR2132446, SRR2132445, SRR2132444, SRR2132443, SRR2132442, SRR2132441, SRR2132440, SRR2132438, SRR2132437, SRR2132436, SRR2132435, SRR2132434, SRR2132433, SRR2132432, SRR2132431, SRR2132430, SRR2132429, SRR2132428, SRR2132427, SRR2132426, SRR2132425, SRR2132424, SRR2132423, SRR2132422, SRR2132421, SRR2132420, SRR2132419, SRR2132418, SRR2132417, SRR2132416, SRR2132415, SRR2132414, SRR2132413, SRR2132412, SRR2132411, SRR2132410, SRR2132409, SRR2132408, SRR2132406, SRR2132405, SRR2132404, SRR2132403, SRR2132402, SRR2132382, SRR2132380, SRR2132333, SRR2132332, SRR2131895, SRR2131894, SRR2131893, SRR2131892, SRR2131891, SRR2131890, SRR2131889, SRR2131888, SRR2131887, SRR2131886, SRR2131885, SRR2131884, SRR2131883, SRR2131882, SRR2131881, SRR2131818, SRR2131817, SRR2131815, SRR2131814, SRR2131813, SRR2131812, SRR2131811, SRR2131810, SRR2131809, SRR2131808, SRR2131362, SRR2131360, SRR2131353, SRR2131350, SRR2131349, SRR2131348, SRR2131347, SRR2131346, SRR2131345, SRR2131344, SRR2131343, SRR2131342, SRR2131178, SRR2131065, SRR2131064, SRR2131063, SRR2131062, SRR2131060, SRR2129987, SRR2129986, SRR2129985, SRR2129984, SRR2129983, SRR2129982, SRR2127991, SRR2127289, SRR2127280, SRR2127279, SRR2127278, SRR2126975, SRR2126915, SRR2126856, SRR2126855, SRR2126417, SRR2126416, SRR2126415, SRR2126414, SRR2126413, SRR2126412, SRR2126411, SRR2126410, SRR2126409, SRR2126408, SRR2126407, SRR2126406, SRR2126312, SRR2126311, SRR2126310, SRR2126309, SRR2126308, SRR2126307, SRR2126306, SRR2126305, SRR2126304, SRR2126303, SRR2126302, SRR2126300, SRR2126299, SRR2121199, SRR2121198, SRR2121197, SRR2121196, SRR2121195, SRR2121194, SRR2121050, SRR2121048, SRR2121046, SRR2121045, SRR2121044, SRR2121043, SRR2120821, SRR2120820, SRR2120819, SRR2120818, SRR2120810, SRR2120809, SRR2120808, SRR2120807, SRR2120806, SRR2120805, SRR2120804, SRR2120803, SRR2120802, SRR2120801, SRR2120800, SRR2120799, SRR2120798, SRR2120797, SRR2120796, SRR2120795, SRR2120794, SRR2120793, SRR2120792, SRR2120791, SRR2120790, SRR2120789, SRR2120788, SRR2120787, SRR2120786, SRR2120785, SRR2120784, SRR2120783, SRR2120781, SRR2120235, SRR2120234, SRR2120232, SRR2120231, SRR2120229, SRR2120227, SRR2120226, SRR2120224, SRR2120214, SRR2120203, SRR2120202, SRR2120180, SRR2120179, SRR2107325, SRR2107324, SRR2107323, SRR2107322, SRR2107297, SRR2107296, SRR2107294, SRR2107269, SRR2107217, SRR2107214, SRR2107189, SRR2107188, SRR2107187, SRR2107186, SRR2107124, SRR2107123, SRR2107122, SRR2107121, SRR2107099, SRR2107093, SRR2107084, SRR2107083, SRR2106959, SRR2106958, SRR2106927, SRR2106926, SRR2106925, SRR2106924, SRR2106923, SRR2106922, SRR2106921, SRR2106920, SRR2106733, SRR2106732, SRR2106731, SRR2106730, SRR2106729, SRR2106728, SRR2106727, SRR2106726, SRR2106725, SRR2106724, SRR2106723, SRR2106722, SRR2106721, SRR2106720, SRR2106719, SRR2106718, SRR2106715, SRR2106714, SRR2106713, SRR2106712,

SRR2106711, SRR2106701, SRR2106700, SRR2106699, SRR2106684, SRR2106683, SRR2106682, SRR2106681, SRR2106680, SRR2106677, SRR2106676, SRR2106675, SRR2106673, SRR2106672, SRR2106671, SRR2106667, SRR2106665, SRR2106536, SRR2106520, SRR2106482, SRR2106481, SRR2106480, SRR2106479, SRR2106478, SRR2106477, SRR2106283, SRR2106280, SRR2106279, SRR2106278, SRR2106277, SRR2106211, SRR2106210, SRR2106209, SRR2106208, SRR2106207, SRR2106206, SRR2106205, SRR2106204, SRR2106203, SRR2106202, SRR2106201, SRR2106200, SRR2106199, SRR2106198, SRR2106197, SRR2106196, SRR2106195, SRR2106194, SRR2106193, SRR2106192, SRR2106191, SRR2106190, SRR2106189, SRR2106188, SRR2106187, SRR2106186, SRR2106185, SRR2106184, SRR2106183, SRR2106182, SRR2106181, SRR2106180, SRR2106052, SRR2106049, SRR2106048, SRR2104401, SRR2103763, SRR2103762, SRR2103761, SRR2103429, SRR2103428, SRR2103427, SRR2103426, SRR2103424, SRR2103421, SRR2103420, SRR2103419, SRR2103418, SRR2103417, SRR2103416, SRR2102905, SRR2102654, SRR2102653, SRR2102652, SRR2102073, SRR2101829, SRR2099917, SRR2099916, SRR2099915, SRR2099914, SRR2099913, SRR2099912, SRR2099440, SRR2099409, SRR2099408, SRR2098994, SRR2098993, SRR2098992, SRR2098821, SRR2097904, SRR2097235, SRR2097232, SRR2096847, SRR2096846, SRR2096845, SRR2096844, SRR2096843, SRR2096842, SRR2096841, SRR2096840, SRR2096839, SRR2096838, SRR2096837, SRR2096836, SRR2095986, SRR2095985, SRR2095969, SRR2095961, SRR2095934, SRR2095924, SRR2095541, SRR2095499, SRR2095295, SRR2095196, SRR2095195, SRR2095065, SRR2095063, SRR2095062, SRR2095061, SRR2095060, SRR2094876, SRR2094874, SRR2094873, SRR2094872, SRR2094871, SRR2094870, SRR2094869, SRR2094868, SRR2094591, SRR2094590, SRR2094588, SRR2094587, SRR2094586, SRR2094585, SRR2094584, SRR2094581, SRR2094580, SRR2094579, SRR2094576, SRR2094575, SRR2094573, SRR2094571, SRR2094566, SRR2094565, SRR2094492, SRR2094395, SRR2094394, SRR2094248, SRR2090176, SRR2089962, SRR2089738, SRR2089737, SRR2089736, SRR2089735, SRR2089734, SRR2089715, SRR2089714, SRR2089713, SRR2089712, SRR2089711, SRR2089710, SRR2089709, SRR2089708, SRR2089707, SRR2089706, SRR2089705, SRR2089704, SRR2089703, SRR2089702, SRR2089701, SRR2089700, SRR2089699, SRR2089698, SRR2089506, SRR2089505, SRR2089352, SRR2089330, SRR2089329, SRR2089328, SRR2089327, SRR2089326, SRR2089325, SRR2089324, SRR2089323, SRR2089322, SRR2089321, SRR2089320, SRR2089319, SRR2089318, SRR2089317, SRR2089316, SRR2089299, SRR2088876, SRR2088875, SRR2088874, SRR2088873, SRR2088872, SRR2088871, SRR2088870, SRR2088869, SRR2088868, SRR2088867, SRR2088866, SRR2088865, SRR2088766, SRR2088765, SRR2087946, SRR2087934, SRR2087933, SRR2087918, SRR2087892, SRR2087891, SRR2087437, SRR2087436, SRR2087198, SRR2087154, SRR2087153, SRR2087152, SRR2087151, SRR2087150, SRR2087149, SRR2087148, SRR2087147, SRR2087144, SRR2087143, SRR2087136, SRR2087132, SRR2086501, SRR2086500, SRR2086499, SRR2086498, SRR2086170, SRR2086169, SRR2086168, SRR2086167, SRR2086166, SRR2086165, SRR2086156, SRR2086147, SRR2086146, SRR2086145, SRR2086144,

SRR2086143, SRR2086142, SRR2086141, SRR2086140, SRR2086139, SRR2086138,
SRR2086137, SRR2086136, SRR2086135, SRR2086134, SRR2086133, SRR2086132,
SRR2086131, SRR2086130, SRR2086129, SRR2086128, SRR2086127, SRR2086126,
SRR2086125, SRR2086124, SRR2086123, SRR2086122, SRR2086121, SRR2086120,
SRR2086119, SRR2086118, SRR2086117, SRR2086116, SRR2086115, SRR2086113,
SRR2086112, SRR2086110, SRR2086109, SRR2086108, SRR2086107, SRR2086106,
SRR2086105, SRR2086104, SRR2086103, SRR2086102, SRR2086101, SRR2086100,
SRR2085476, SRR2085475, SRR2085474, SRR2085473, SRR2085449, SRR2085288,
SRR2083739, SRR2082965, SRR2082958, SRR2082953, SRR2082943, SRR2082935,
SRR2082865, SRR2082832, SRR2082831, SRR2082813, SRR2082796, SRR2082791,
SRR2082790, SRR2082688, SRR2082687, SRR2082686, SRR2082685, SRR2082684,
SRR2082683, SRR2081058, SRR2081057, SRR2081056, SRR2081055, SRR2081054,
SRR2081053, SRR2081052, SRR2081051, SRR2081050, SRR2081048, SRR2081047,
SRR2081046, SRR2081045, SRR2081044, SRR2081042, SRR2081041, SRR2081040,
SRR2081039, SRR2081038, SRR2081026, SRR2081025, SRR2081024, SRR2081023,
SRR2081022, SRR2081021, SRR2081020, SRR2081019, SRR2081018, SRR2081017,
SRR2081016, SRR2081015, SRR2081014, SRR2081013, SRR2081012, SRR2081011,
SRR2081010, SRR2081009, SRR2081008, SRR2081007, SRR2081006, SRR2081005,
SRR2081004, SRR2081003, SRR2081002, SRR2081001, SRR2081000, SRR2080999,
SRR2080998, SRR2080997, SRR2080996, SRR2080995, SRR2080994, SRR2080993,
SRR2080992, SRR2080991, SRR2080990, SRR2080989, SRR2080988, SRR2080987,
SRR2080986, SRR2080985, SRR2080984, SRR2080983, SRR2080982, SRR2080981,
SRR2080980, SRR2080979, SRR2080978, SRR2080977, SRR2080976, SRR2080294,
SRR2080279, SRR2080156, SRR2080155, SRR2080154, SRR2080153, SRR2080151,
SRR2080150, SRR2080149, SRR2080148, SRR2080138, SRR2080137, SRR2080132,
SRR2080131, SRR2080099, SRR2080098, SRR2080097, SRR2080096, SRR2080095,
SRR2080094, SRR2080056, SRR2080055, SRR2080053, SRR2080052, SRR2080051,
SRR2080050, SRR2080049, SRR2080048, SRR2080047, SRR2080046, SRR2080045,
SRR2080044, SRR2080043, SRR2080042, SRR2080041, SRR2080040, SRR2080039,
SRR2080038, SRR2080037, SRR2080036, SRR2080035, SRR2080034, SRR2080033,
SRR2080032, SRR2080031, SRR2079812, SRR2079811, SRR2079810, SRR2079809,
SRR2079808, SRR2079807, SRR2079806, SRR2079805, SRR2079804, SRR2079803,
SRR2079802, SRR2079801, SRR2079800, SRR2079799, SRR2079798, SRR2079797,
SRR2079796, SRR2079795, SRR2079794, SRR2079793, SRR2079792, SRR2079791,
SRR2079790, SRR2079789, SRR2079788, SRR2079787, SRR2079786, SRR2079785,
SRR2079784, SRR2079783, SRR2079782, SRR2079781, SRR2079780, SRR2079779,
SRR2079778, SRR2079777, SRR2079776, SRR2079775, SRR2079774, SRR2079773,
SRR2079772, SRR2079771, SRR2079653, SRR2079652, SRR2079651, SRR2079650,
SRR2079649, SRR2079648, SRR2079647, SRR2079646, SRR2079645, SRR2079644,
SRR2079643, SRR2079642, SRR2079329, SRR2079328, SRR2079327, SRR2079326,
SRR2078798, SRR2078797, SRR2078796, SRR2078795, SRR2078794, SRR2078793,
SRR2078792, SRR2078791, SRR2078698, SRR2078300, SRR2078295, SRR2078294,

SRR2078293, SRR2078292, SRR2078291, SRR2078290, SRR2078289, SRR2078288,
SRR2078287, SRR2078286, SRR2078285, SRR2078284, SRR2078179, SRR2078177,
SRR2076097, SRR2076096, SRR2076095, SRR2075821, SRR2075819, SRR2075816,
SRR2075815, SRR2075766, SRR2074729, SRR2074649, SRR2074648, SRR2073179,
SRR2073176, SRR2073174, SRR2073146, SRR2073145, SRR2073144, SRR2073143,
SRR2073142, SRR2073141, SRR2072598, SRR2072466, SRR2072465, SRR2072464,
SRR2072463, SRR2072462, SRR2072461, SRR2072460, SRR2072459, SRR2072458,
SRR2072457, SRR2072456, SRR2072455, SRR2072451, SRR2072450, SRR2072449,
SRR2072448, SRR2072447, SRR2072446, SRR2072445, SRR2072444, SRR2072443,
SRR2072442, SRR2072441, SRR2072440, SRR2072439, SRR2072438, SRR2072437,
SRR2072436, SRR2072435, SRR2072434, SRR2072433, SRR2072432, SRR2072431,
SRR2072430, SRR2072429, SRR2072428, SRR2072427, SRR2072426, SRR2072425,
SRR2072424, SRR2072423, SRR2072422, SRR2072421, SRR2072420, SRR2072419,
SRR2072418, SRR2072417, SRR2072416, SRR2072415, SRR2072414, SRR2072413,
SRR2072412, SRR2072411, SRR2072410, SRR2072409, SRR2072408, SRR2072406,
SRR2072405, SRR2072404, SRR2072403, SRR2072402, SRR2072401, SRR2072400,
SRR2072399, SRR2072398, SRR2072397, SRR2072396, SRR2072395, SRR2072394,
SRR2072393, SRR2072392, SRR2072391, SRR2072390, SRR2072389, SRR2072388,
SRR2072208, SRR2072207, SRR2072013, SRR2072012, SRR2072011, SRR2072010,
SRR2072009, SRR2072008, SRR2072007, SRR2072006, SRR2072005, SRR2072003,
SRR2072002, SRR2072000, SRR2071999, SRR2071997, SRR2071996, SRR2071995,
SRR2071994, SRR2071993, SRR2071992, SRR2071991, SRR2071990, SRR2071989,
SRR2071988, SRR2071987, SRR2071272, SRR2070774, SRR2070770, SRR2070764,
SRR2070762, SRR2070761, SRR2070759, SRR2070757, SRR2070755, SRR2070754,
SRR2070627, SRR2070626, SRR2070076, SRR2070075, SRR2070071, SRR2069948,
SRR2069936, SRR2069935, SRR2069934, SRR2069933, SRR2069902, SRR2069901,
SRR2069900, SRR2068589, SRR2068584, SRR2068580, SRR2068577, SRR2068335,
SRR2068333, SRR2068328, SRR2068327, SRR2068323, SRR2068320, SRR2068315,
SRR2068294, SRR2068291, SRR2068288, SRR2068285, SRR2068282, SRR2068278,
SRR2068274, SRR2068271, SRR2067972, SRR2067775, SRR2067700, SRR2067636,
SRR2067533, SRR2067528, SRR2067493, SRR2067492, SRR2067491, SRR2067490,
SRR2063819, SRR2063818, SRR2063816, SRR2063808, SRR2063807, SRR2063806,
SRR2063803, SRR2063800, SRR2063752, SRR2063750, SRR2062468, SRR2062467,
SRR2062466, SRR2062465, SRR2062149, SRR2062145, SRR2062140, SRR2062136,
SRR2062131, SRR2062127, SRR2062123, SRR2062119, SRR2062116, SRR2062113,
SRR2062111, SRR2062106, SRR2062102, SRR2062098, SRR2062095, SRR2062089,
SRR2062078, SRR2062073, SRR2062070, SRR2062067, SRR2062061, SRR2062053,
SRR2061406, SRR2061405, SRR2061403, SRR2061402, SRR2061401, SRR2061400,
SRR2061399, SRR2061398, SRR2061397, SRR2060997, SRR2060995, SRR2060994,
SRR2060976, SRR2060972, SRR2060971, SRR2060634, SRR2060632, SRR2060631,
SRR2060329, SRR2060328, SRR2060327, SRR2060326, SRR2060325, SRR2060324,
SRR2060323, SRR2060322, SRR2060321, SRR2060320, SRR2060319, SRR2060318,

SRR2060093, SRR2058996, SRR2057955, SRR2057897, SRR2057895, SRR2057890,
SRR2057017, SRR2057015, SRR2056510, SRR2056509, SRR2056507, SRR2056506,
SRR2056504, SRR2056502, SRR2056501, SRR2056499, SRR2056498, SRR2056496,
SRR2056495, SRR2056493, SRR2056491, SRR2056490, SRR2056488, SRR2056487,
SRR2056485, SRR2056484, SRR2056482, SRR2056481, SRR2056479, SRR2056476,
SRR2056465, SRR2056459, SRR2056052, SRR2056051, SRR2054647, SRR2054361,
SRR2054360, SRR2054359, SRR2054358, SRR2054357, SRR2054356, SRR2054355,
SRR2054354, SRR2054353, SRR2054352, SRR2054351, SRR2054350, SRR2054349,
SRR2054348, SRR2054347, SRR2054346, SRR2054345, SRR2054344, SRR2052642,
SRR2052641, SRR2052640, SRR2052639, SRR2052638, SRR2052637, SRR2052636,
SRR2052580, SRR2052573, SRR2052571, SRR2052570, SRR2052569, SRR2052568,
SRR2052560, SRR2052551, SRR2052542, SRR2052541, SRR2052539, SRR2052538,
SRR2052526, SRR2049181, SRR2049180, SRR2049179, SRR2049178, SRR2049177,
SRR2049176, SRR2049175, SRR2049174, SRR2049087, SRR2048575, SRR2048574,
SRR2048573, SRR2048572, SRR2048540, SRR2048202, SRR2048201, SRR2048200,
SRR2048199, SRR2048198, SRR2048197, SRR2048196, SRR2048195, SRR2048194,
SRR2048193, SRR2048192, SRR2048191, SRR2048190, SRR2048189, SRR2048188,
SRR2048187, SRR2048186, SRR2048185, SRR2048184, SRR2048183, SRR2048182,
SRR2048181, SRR2048180, SRR2048179, SRR2048178, SRR2048177, SRR2048176,
SRR2048175, SRR2048174, SRR2048173, SRR2048172, SRR2048171, SRR2048170,
SRR2048169, SRR2048167, SRR2048166, SRR2047477, SRR2047455, SRR2047445,
SRR2047443, SRR2047439, SRR2047438, SRR2047437, SRR2047436, SRR2047434,
SRR2047432, SRR2047431, SRR2047430, SRR2047429, SRR2047428, SRR2047427,
SRR2047426, SRR2047411, SRR2047087, SRR2047033, SRR2047031, SRR2047029,
SRR2046995, SRR2046994, SRR2046993, SRR2046992, SRR2046816, SRR2046815,
SRR2046814, SRR2046813, SRR2046812, SRR2046811, SRR2046217, SRR2046215,
SRR2046213, SRR2046210, SRR2046209, SRR2046208, SRR2046207, SRR2046205,
SRR2046204, SRR2046203, SRR2045996, SRR2045901, SRR2045900, SRR2045899,
SRR2045898, SRR2045897, SRR2045896, SRR2045895, SRR2045894, SRR2045893,
SRR2045892, SRR2045891, SRR2045890, SRR2045889, SRR2045888, SRR2045887,
SRR2045886, SRR2045885, SRR2045884, SRR2045731, SRR2045729, SRR2045714,
SRR2045581, SRR2045382, SRR2045381, SRR2045380, SRR2045379, SRR2045378,
SRR2045377, SRR2045376, SRR2045375, SRR2045374, SRR2045373, SRR2045372,
SRR2045371, SRR2045281, SRR2045280, SRR2045278, SRR2045276, SRR2045243,
SRR2045242, SRR2045240, SRR2045239, SRR2045238, SRR2045237, SRR2045236,
SRR2045235, SRR2045234, SRR2045233, SRR2045232, SRR2045231, SRR2045230,
SRR2045229, SRR2045228, SRR2045194, SRR2045193, SRR2045192, SRR2045191,
SRR2045190, SRR2045189, SRR2045188, SRR2045187, SRR2045186, SRR2045180,
SRR2045148, SRR2045120, SRR2045119, SRR2045118, SRR2045117, SRR2044954,
SRR2044922, SRR2044894, SRR2044893, SRR2044890, SRR2044887, SRR2044847,
SRR2044845, SRR2044702, SRR2044699, SRR2044698, SRR2043992, SRR2043991,
SRR2043985, SRR2043938, SRR2043937, SRR2043911, SRR2043910, SRR2043909,

SRR2043908, SRR2043907, SRR2043906, SRR2043905, SRR2043904, SRR2043903, SRR2043902, SRR2043901, SRR2043900, SRR2043899, SRR2043898, SRR2043897, SRR2043896, SRR2043895, SRR2043894, SRR2043893, SRR2043892, SRR2043891, SRR2043890, SRR2043889, SRR2043888, SRR2043887, SRR2043886, SRR2043885, SRR2043883, SRR2043882, SRR2043881, SRR2043880, SRR2043879, SRR2043878, SRR2043877, SRR2043876, SRR2043875, SRR2043874, SRR2043873, SRR2043872, SRR2043871, SRR2043870, SRR2043869, SRR2043868, SRR2043867, SRR2043866, SRR2043865, SRR2043864, SRR2043863, SRR2043862, SRR2043861, SRR2043860, SRR2043859, SRR2043858, SRR2043857, SRR2043856, SRR2043855, SRR2043854, SRR2043853, SRR2043852, SRR2043851, SRR2043850, SRR2043849, SRR2043848, SRR2043847, SRR2043846, SRR2043845, SRR2043844, SRR2043843, SRR2043842, SRR2043841, SRR2043840, SRR2043839, SRR2043838, SRR2043837, SRR2043836, SRR2043835, SRR2043834, SRR2043833, SRR2043832, SRR2043831, SRR2043830, SRR2043829, SRR2043828, SRR2043827, SRR2043826, SRR2043825, SRR2043824, SRR2043823, SRR2043822, SRR2043821, SRR2043820, SRR2043819, SRR2043818, SRR2043817, SRR2043816, SRR2043815, SRR2043814, SRR2043813, SRR2043812, SRR2043811, SRR2043810, SRR2043809, SRR2043808, SRR2043807, SRR2043806, SRR2043805, SRR2043804, SRR2043803, SRR2043802, SRR2043801, SRR2043800, SRR2043799, SRR2043798, SRR2043797, SRR2043796, SRR2043795, SRR2043794, SRR2043793, SRR2043792, SRR2043791, SRR2043790, SRR2043789, SRR2043788, SRR2043787, SRR2043786, SRR2043785, SRR2043784, SRR2043783, SRR2043782, SRR2043781, SRR2043780, SRR2043779, SRR2043778, SRR2043777, SRR2043776, SRR2043775, SRR2043774, SRR2043773, SRR2043772, SRR2043771, SRR2043770, SRR2043769, SRR2043768, SRR2043767, SRR2043766, SRR2043765, SRR2043764, SRR2043763, SRR2043762, SRR2043761, SRR2043760, SRR2043759, SRR2043758, SRR2043757, SRR2043756, SRR2043755, SRR2043754, SRR2043753, SRR2043752, SRR2043751, SRR2043750, SRR2043749, SRR2043748, SRR2043747, SRR2043746, SRR2043745, SRR2043192, SRR2043186, SRR2043072, SRR2043070, SRR2043068, SRR2043067, SRR2042559, SRR2042558, SRR2042557, SRR2042556, SRR2042555, SRR2042554, SRR2042553, SRR2042552, SRR2042551, SRR2042550, SRR2042549, SRR2042548, SRR2042547, SRR2042546, SRR2042545, SRR2042543, SRR2042542, SRR2042541, SRR2042540, SRR2042539, SRR2042538, SRR2042537, SRR2042536, SRR2042535, SRR2042534, SRR2042533, SRR2042532, SRR2042531, SRR2042530, SRR2042529, SRR2042528, SRR2042527, SRR2042526, SRR2042525, SRR2042524, SRR2042523, SRR2042522, SRR2042521, SRR2042520, SRR2042519, SRR2042518, SRR2042517, SRR2042516, SRR2042515, SRR2042514, SRR2042513, SRR2042512, SRR2042511, SRR2042510, SRR2042509, SRR2042508, SRR2042507, SRR2042506, SRR2042505, SRR2042504, SRR2042472, SRR2041628, SRR2041594, SRR2041192, SRR2041158, SRR2041101, SRR2041050, SRR2040851, SRR2040571, SRR2040569, SRR2040568, SRR2040567, SRR2040542, SRR2040541, SRR2040538, SRR2040537, SRR2040534, SRR2040533, SRR2040532, SRR2040529, SRR2040411, SRR2040410, SRR2040409, SRR2040408, SRR2040407, SRR2040406, SRR2040405, SRR2040404,

SRR2040403, SRR2040402, SRR2040401, SRR2040400, SRR2040399, SRR2040398,
SRR2040397, SRR2040396, SRR2040395, SRR2040394, SRR2040393, SRR2040392,
SRR2040391, SRR2040390, SRR2040389, SRR2040388, SRR2040387, SRR2040386,
SRR2040385, SRR2040384, SRR2040383, SRR2040382, SRR2040381, SRR2040380,
SRR2040169, SRR2040168, SRR2040167, SRR2040138, SRR2040137, SRR2040136,
SRR2040135, SRR2040134, SRR2040133, SRR2039802, SRR2039801, SRR2039800,
SRR2039799, SRR2039798, SRR2039797, SRR2039796, SRR2039795, SRR2039794,
SRR2039793, SRR2039597, SRR2039591, SRR2039564, SRR2039562, SRR2039561,
SRR2039559, SRR2039557, SRR2039182, SRR2039181, SRR2038442, SRR2037202,
SRR2037201, SRR2037200, SRR2037199, SRR2037124, SRR2036230, SRR2036229,
SRR2035327, SRR2035263, SRR2035212, SRR2034749, SRR2034748, SRR2034747,
SRR2034746, SRR2034745, SRR2034744, SRR2034623, SRR2034622, SRR2034621,
SRR2034620, SRR2034619, SRR2033959, SRR2033958, SRR2033957, SRR2033956,
SRR2033955, SRR2033954, SRR2033953, SRR2033952, SRR2033951, SRR2033950,
SRR2033949, SRR2033948, SRR2033943, SRR2033942, SRR2033941, SRR2033940,
SRR2032825, SRR2032824, SRR2032823, SRR2032822, SRR2032821, SRR2032820,
SRR2032819, SRR2032502, SRR2032501, SRR2032500, SRR2032499, SRR2032498,
SRR2032497, SRR2032496, SRR2032495, SRR2032494, SRR2032493, SRR2032492,
SRR2032491, SRR2032490, SRR2032489, SRR2032488, SRR2032487, SRR2032486,
SRR2032485, SRR2032484, SRR2032483, SRR2032482, SRR2032481, SRR2032480,
SRR2032479, SRR2032478, SRR2032477, SRR2032476, SRR2032475, SRR2032474,
SRR2032473, SRR2032472, SRR2032471, SRR2032470, SRR2032469, SRR2032468,
SRR2032467, SRR2032466, SRR2032465, SRR2032464, SRR2032463, SRR2032462,
SRR2032461, SRR2032460, SRR2032459, SRR2032458, SRR2032457, SRR2032454,
SRR2032453, SRR2032452, SRR2032451, SRR2032450, SRR2032449, SRR2032448,
SRR2032447, SRR2032446, SRR2032445, SRR2032444, SRR2032443, SRR2032442,
SRR2032441, SRR2032440, SRR2032439, SRR2032438, SRR2032437, SRR2032436,
SRR2032435, SRR2032434, SRR2032433, SRR2032432, SRR2032431, SRR2032387,
SRR2032358, SRR2029851, SRR2029850, SRR2029849, SRR2029848, SRR2029833,
SRR2029778, SRR2029777, SRR2029776, SRR2029745, SRR2029397, SRR2029396,
SRR2029395, SRR2029394, SRR2029393, SRR2029392, SRR2029391, SRR2029390,
SRR2029389, SRR2029381, SRR2029378, SRR2029376, SRR2027988, SRR2027757,
SRR2025355, SRR2025354, SRR2025353, SRR2025352, SRR2025351, SRR2025350,
SRR2025071, SRR2017832, SRR2016897, SRR2016895, SRR2016894, SRR2016892,
SRR2016890, SRR2016864, SRR2016862, SRR2016861, SRR2016859, SRR2016855,
SRR2016853, SRR2016846, SRR2016843, SRR2016838, SRR2016805, SRR2016648,
SRR2016566, SRR2016207, SRR2016191, SRR2016190, SRR2016189, SRR2016188,
SRR2016187, SRR2016186, SRR2015555, SRR2015362, SRR2015361, SRR2015359,
SRR2015358, SRR2015295, SRR2015234, SRR2015233, SRR2014835, SRR2014766,
SRR2014765, SRR2014764, SRR2014763, SRR2014762, SRR2014761, SRR2014760,
SRR2014759, SRR2014758, SRR2014757, SRR2014756, SRR2014755, SRR2014754,
SRR2014753, SRR2014752, SRR2014751, SRR2014663, SRR2014622, SRR2014621,

SRR2014585, SRR2014478, SRR2014477, SRR2014396, SRR2014325, SRR2014246, SRR2014236, SRR2014230, SRR2014149, SRR2014148, SRR2014147, SRR2014146, SRR2014143, SRR2014142, SRR2012717, SRR2012715, SRR2012711, SRR2012709, SRR2012707, SRR2012672, SRR2012668, SRR2012595, SRR2012592, SRR2012580, SRR2012531, SRR2012529, SRR2011293, SRR2011292, SRR2011291, SRR2011289, SRR2010690, SRR2010689, SRR2010688, SRR2010687, SRR2010412, SRR2010411, SRR2010410, SRR2010409, SRR2010408, SRR2010407, SRR2010406, SRR2010405, SRR2010404, SRR2010401, SRR2010400, SRR2009656, SRR2009649, SRR2006798, SRR2006797, SRR2006796, SRR2006795, SRR2006794, SRR2006793, SRR2006792, SRR2006791, SRR2006631, SRR2006630, SRR2006629, SRR2006628, SRR2006627, SRR2006626, SRR2006625, SRR2006624, SRR2006623, SRR2006622, SRR2005989, SRR2005884, SRR2005883, SRR2005880, SRR2005879, SRR2005878, SRR2005877, SRR2005876, SRR2005875, SRR2005732, SRR2005731, SRR2005729, SRR2003674, SRR2003673, SRR2003670, SRR2003669, SRR2003668, SRR2003667, SRR2003666, SRR2003663, SRR2003662, SRR2003661, SRR2003660, SRR2003658, SRR2003657, SRR2003656, SRR2003655, SRR2003654, SRR2003653, SRR2003651, SRR2003650, SRR2003649, SRR2003648, SRR2003646, SRR2003645, SRR2003644, SRR2003643, SRR2003642, SRR2003641, SRR2003640, SRR2003639, SRR2003636, SRR2003635, SRR2003634, SRR2003633, SRR2003631, SRR2003630, SRR2003629, SRR2003628, SRR2003627, SRR2003626, SRR2003625, SRR2003624, SRR2003623, SRR2003622, SRR2003621, SRR2003620, SRR2003619, SRR2003618, SRR2003617, SRR2003616, SRR2003615, SRR2003614, SRR2003613, SRR2003612, SRR2003611, SRR2003610, SRR2003609, SRR2003608, SRR2003607, SRR2003606, SRR2003404, SRR2003402, SRR2003401, SRR2003400, SRR2003285, SRR2003281, SRR2003279, SRR2003063, SRR2003061, SRR2003059, SRR2002965, SRR2002963, SRR2002847, SRR2002810, SRR2002807, SRR2002805, SRR2002804, SRR2002803, SRR2002802, SRR2002801, SRR2002800, SRR2002563, SRR2002562, SRR2002561, SRR2002450, SRR2002284, SRR2001830, SRR2001651, SRR2001649, SRR2001648, SRR2001647, SRR2001642, SRR2001639, SRR2001631, SRR2001630, SRR2001623, SRR2001620, SRR2001619, SRR2001618, SRR2001614, SRR2001609, SRR2001606, SRR2001605, SRR2000603, SRR2000602, SRR2000601, SRR2000600, SRR2000599, SRR2000598, SRR2000597, SRR2000596, SRR2000595, SRR2000594, SRR2000593, SRR2000592, SRR2000591, SRR2000590, SRR2000589, SRR2000588, SRR2000587, SRR2000586, SRR2000585, SRR2000584, SRR2000583, SRR2000582, SRR2000581, SRR2000580, SRR2000579, SRR2000578, SRR2000577, SRR2000576, SRR2000042, SRR2000041, SRR2000036, SRR2000035, SRR1999879, SRR1999878, SRR1999876, SRR1999873, SRR1999867, SRR1999861, SRR1999857, SRR1999855, SRR1999853, SRR1999852, SRR1999851, SRR1999850, SRR1999849, SRR1999848, SRR1999847, SRR1999846, SRR1999845, SRR1999844, SRR1999843, SRR1999842, SRR1999841, SRR1999840, SRR1999839, SRR1999838, SRR1999837, SRR1999836, SRR1999834, SRR1999833, SRR1999829, SRR1999827, SRR1999826, SRR1999824, SRR1999821, SRR1999819, SRR1999816, SRR1999815, SRR1999814, SRR1999813, SRR1999812, SRR1999810, SRR1999809,

SRR1999808, SRR1999807, SRR1999806, SRR1999805, SRR1999804, SRR1999802,
SRR1999801, SRR1999797, SRR1999795, SRR1999792, SRR1999791, SRR1999787,
SRR1999786, SRR1999777, SRR1999776, SRR1999763, SRR1999756, SRR1999747,
SRR1999745, SRR1999743, SRR1999742, SRR1999741, SRR1999350, SRR1999349,
SRR1999348, SRR1999347, SRR1999346, SRR1999345, SRR1998072, SRR1998071,
SRR1998070, SRR1998045, SRR1998044, SRR1998043, SRR1998042, SRR1998041,
SRR1998040, SRR1998039, SRR1998038, SRR1998037, SRR1998036, SRR1998035,
SRR1998034, SRR1998033, SRR1998032, SRR1998031, SRR1998030, SRR1998028,
SRR1998027, SRR1998026, SRR1998025, SRR1998024, SRR1998023, SRR1998022,
SRR1998021, SRR1998020, SRR1998019, SRR1998018, SRR1998017, SRR1998016,
SRR1998015, SRR1998014, SRR1998013, SRR1998012, SRR1998011, SRR1998010,
SRR1998009, SRR1998008, SRR1998007, SRR1998003, SRR1998002, SRR1998001,
SRR1998000, SRR1997999, SRR1997998, SRR1997997, SRR1997996, SRR1997995,
SRR1997994, SRR1997993, SRR1997992, SRR1997991, SRR1997990, SRR1997989,
SRR1997988, SRR1997987, SRR1997986, SRR1997985, SRR1997984, SRR1997983,
SRR1997982, SRR1997981, SRR1997980, SRR1997979, SRR1997978, SRR1997977,
SRR1997976, SRR1997975, SRR1997866, SRR1997865, SRR1996221, SRR1994961,
SRR1994959, SRR1994958, SRR1994892, SRR1994889, SRR1994885, SRR1994880,
SRR1994854, SRR1994853, SRR1994852, SRR1994851, SRR1994762, SRR1994279,
SRR1994146, SRR1994145, SRR1994144, SRR1987401, SRR1987333, SRR1987332,
SRR1987331, SRR1987330, SRR1987329, SRR1987328, SRR1987327, SRR1987326,
SRR1986376, SRR1986040, SRR1986039, SRR1986038, SRR1986037, SRR1985111,
SRR1985109, SRR1985108, SRR1985107, SRR1985106, SRR1985105, SRR1985104,
SRR1985103, SRR1985102, SRR1985101, SRR1985100, SRR1985099, SRR1985098,
SRR1985095, SRR1985094, SRR1985083, SRR1985082, SRR1985081, SRR1985080,
SRR1985079, SRR1985078, SRR1985077, SRR1985076, SRR1985075, SRR1985048,
SRR1985047, SRR1985046, SRR1985045, SRR1985044, SRR1985043, SRR1985042,
SRR1985041, SRR1985036, SRR1985035, SRR1985034, SRR1985033, SRR1985032,
SRR1985031, SRR1985030, SRR1985029, SRR1985028, SRR1985027, SRR1985026,
SRR1985024, SRR1985023, SRR1985021, SRR1985020, SRR1985019, SRR1985017,
SRR1985015, SRR1985012, SRR1985011, SRR1985008, SRR1985003, SRR1984995,
SRR1984994, SRR1984992, SRR1984990, SRR1984989, SRR1984987, SRR1984985,
SRR1984984, SRR1984983, SRR1984969, SRR1984544, SRR1984543, SRR1984541,
SRR1984540, SRR1984538, SRR1984536, SRR1984535, SRR1984532, SRR1984531,
SRR1984530, SRR1984528, SRR1984527, SRR1982831, SRR1982454, SRR1982453,
SRR1982452, SRR1982451, SRR1982275, SRR1982272, SRR1982268, SRR1982267,
SRR1982265, SRR1982264, SRR1982263, SRR1982261, SRR1982259, SRR1982257,
SRR1982256, SRR1982255, SRR1982253, SRR1982252, SRR1982250, SRR1982245,
SRR1981172, SRR1981154, SRR1980930, SRR1980929, SRR1980928, SRR1980927,
SRR1980926, SRR1980925, SRR1980924, SRR1980899, SRR1980896, SRR1980895,
SRR1980894, SRR1980892, SRR1980597, SRR1980595, SRR1980592, SRR1980246,
SRR1980245, SRR1980244, SRR1980243, SRR1980242, SRR1980241, SRR1980240,

SRR1980239, SRR1980023, SRR1979689, SRR1979688, SRR1979687, SRR1979686,
SRR1979685, SRR1979684, SRR1979683, SRR1979682, SRR1979681, SRR1979680,
SRR1979679, SRR1979678, SRR1979677, SRR1979676, SRR1979669, SRR1979668,
SRR1979667, SRR1979666, SRR1979665, SRR1979664, SRR1979663, SRR1979662,
SRR1979661, SRR1979660, SRR1979659, SRR1979658, SRR1979657, SRR1979656,
SRR1979263, SRR1979262, SRR1979261, SRR1979260, SRR1979259, SRR1979258,
SRR1979124, SRR1979118, SRR1979105, SRR1979100, SRR1979038, SRR1979015,
SRR1979014, SRR1979013, SRR1978953, SRR1978712, SRR1978711, SRR1978710,
SRR1978709, SRR1978705, SRR1978704, SRR1978699, SRR1976517, SRR1976516,
SRR1976515, SRR1976514, SRR1976513, SRR1976512, SRR1976501, SRR1976500,
SRR1976498, SRR1976497, SRR1976496, SRR1976495, SRR1976494, SRR1976493,
SRR1976492, SRR1976491, SRR1976490, SRR1976489, SRR1976488, SRR1976487,
SRR1976486, SRR1976485, SRR1976484, SRR1976483, SRR1976482, SRR1976481,
SRR1976480, SRR1976479, SRR1976478, SRR1976477, SRR1976476, SRR1976475,
SRR1976474, SRR1976473, SRR1976472, SRR1976471, SRR1976470, SRR1976469,
SRR1976468, SRR1976467, SRR1976466, SRR1976175, SRR1976174, SRR1976173,
SRR1976172, SRR1976171, SRR1976170, SRR1976169, SRR1976168, SRR1976167,
SRR1976166, SRR1976165, SRR1976164, SRR1976163, SRR1976162, SRR1976161,
SRR1976160, SRR1976159, SRR1976158, SRR1976157, SRR1976156, SRR1976155,
SRR1975208, SRR1975207, SRR1975206, SRR1975205, SRR1975204, SRR1975203,
SRR1975202, SRR1975201, SRR1975200, SRR1975199, SRR1975198, SRR1975197,
SRR1975196, SRR1975195, SRR1975194, SRR1975193, SRR1975011, SRR1974519,
SRR1974265, SRR1974208, SRR1974149, SRR1972541, SRR1972525, SRR1972524,
SRR1972523, SRR1972493, SRR1970644, SRR1970643, SRR1970642, SRR1970640,
SRR1970639, SRR1970638, SRR1970637, SRR1970636, SRR1970635, SRR1970634,
SRR1970633, SRR1970544, SRR1970515, SRR1970481, SRR1970480, SRR1970478,
SRR1970477, SRR1970475, SRR1970474, SRR1970473, SRR1970472, SRR1970471,
SRR1970470, SRR1970469, SRR1970468, SRR1970467, SRR1970466, SRR1970465,
SRR1970464, SRR1970463, SRR1970462, SRR1965570, SRR1965022, SRR1965021,
SRR1965020, SRR1965019, SRR1965018, SRR1965017, SRR1965016, SRR1965015,
SRR1965014, SRR1965013, SRR1965012, SRR1965011, SRR1965010, SRR1965009,
SRR1965008, SRR1965007, SRR1965006, SRR1965005, SRR1965004, SRR1965003,
SRR1965002, SRR1965001, SRR1964999, SRR1964998, SRR1964997, SRR1964996,
SRR1964995, SRR1964994, SRR1964993, SRR1964992, SRR1964991, SRR1959702,
SRR1959701, SRR1959700, SRR1959699, SRR1959698, SRR1959697, SRR1959696,
SRR1959695, SRR1959694, SRR1959693, SRR1959692, SRR1959691, SRR1959690,
SRR1959689, SRR1959688, SRR1959687, SRR1959686, SRR1959685, SRR1959684,
SRR1959683, SRR1959682, SRR1959681, SRR1959680, SRR1959679, SRR1958937,
SRR1958936, SRR1958935, SRR1958934, SRR1958933, SRR1958932, SRR1958931,
SRR1958930, SRR1958929, SRR1958928, SRR1958927, SRR1958926, SRR1958925,
SRR1958924, SRR1958923, SRR1958922, SRR1958921, SRR1958920, SRR1958919,
SRR1958918, SRR1958917, SRR1958916, SRR1958915, SRR1958914, SRR1958913,

SRR1958912, SRR1958911, SRR1958910, SRR1958909, SRR1958908, SRR1958907,
SRR1958906, SRR1958905, SRR1958904, SRR1958903, SRR1958902, SRR1958901,
SRR1958792, SRR1958791, SRR1958790, SRR1958788, SRR1958787, SRR1958786,
SRR1958785, SRR1958784, SRR1958783, SRR1958782, SRR1958781, SRR1958780,
SRR1958779, SRR1958778, SRR1958777, SRR1958776, SRR1958775, SRR1958774,
SRR1958773, SRR1958770, SRR1958769, SRR1958768, SRR1958767, SRR1958766,
SRR1958765, SRR1958764, SRR1958763, SRR1958762, SRR1958761, SRR1958760,
SRR1958759, SRR1958758, SRR1958756, SRR1958755, SRR1958754, SRR1958753,
SRR1958751, SRR1958750, SRR1958749, SRR1958748, SRR1958747, SRR1958746,
SRR1958745, SRR1958744, SRR1958743, SRR1958741, SRR1958740, SRR1958739,
SRR1958738, SRR1958737, SRR1958736, SRR1958735, SRR1958734, SRR1958733,
SRR1958732, SRR1958731, SRR1958730, SRR1958729, SRR1958728, SRR1958727,
SRR1958718, SRR1958717, SRR1958716, SRR1958715, SRR1958714, SRR1958713,
SRR1958712, SRR1958711, SRR1958710, SRR1958709, SRR1958708, SRR1958706,
SRR1958705, SRR1958704, SRR1958703, SRR1958702, SRR1958700, SRR1958698,
SRR1957684, SRR1957327, SRR1957326, SRR1957325, SRR1957123, SRR1957050,
SRR1956913, SRR1956847, SRR1956846, SRR1956845, SRR1956844, SRR1956843,
SRR1956842, SRR1956841, SRR1956840, SRR1956839, SRR1956838, SRR1956837,
SRR1956836, SRR1956757, SRR1956721, SRR1956720, SRR1956718, SRR1956716,
SRR1956535, SRR1956534, SRR1955886, SRR1955548, SRR1955167, SRR1955166,
SRR1955165, SRR1955163, SRR1955162, SRR1955061, SRR1955060, SRR1955058,
SRR1955057, SRR1955056, SRR1955055, SRR1955054, SRR1955053, SRR1955052,
SRR1955050, SRR1955049, SRR1955048, SRR1955047, SRR1955046, SRR1955045,
SRR1955000, SRR1954916, SRR1954915, SRR1954913, SRR1954912, SRR1954911,
SRR1954910, SRR1954909, SRR1954908, SRR1954907, SRR1954906, SRR1954905,
SRR1954904, SRR1954903, SRR1954902, SRR1954901, SRR1954900, SRR1954899,
SRR1954898, SRR1954897, SRR1954896, SRR1954895, SRR1954894, SRR1954893,
SRR1954892, SRR1954891, SRR1954890, SRR1954889, SRR1954888, SRR1954887,
SRR1954886, SRR1954885, SRR1954884, SRR1954883, SRR1954882, SRR1954881,
SRR1954880, SRR1954879, SRR1954878, SRR1954877, SRR1954876, SRR1954875,
SRR1954874, SRR1954873, SRR1954872, SRR1954871, SRR1954870, SRR1954869,
SRR1952996, SRR1952817, SRR1952810, SRR1952809, SRR1952808, SRR1952807,
SRR1952806, SRR1952805, SRR1952804, SRR1952803, SRR1952802, SRR1952801,
SRR1952800, SRR1952799, SRR1952798, SRR1952797, SRR1952796, SRR1952795,
SRR1952794, SRR1952793, SRR1952792, SRR1952791, SRR1952790, SRR1952789,
SRR1952788, SRR1952787, SRR1952786, SRR1952785, SRR1952784, SRR1952783,
SRR1952782, SRR1952781, SRR1952780, SRR1952779, SRR1952778, SRR1952649,
SRR1952648, SRR1952647, SRR1952646, SRR1952645, SRR1952644, SRR1952643,
SRR1952642, SRR1952641, SRR1952640, SRR1952639, SRR1952638, SRR1952637,
SRR1952636, SRR1952635, SRR1952634, SRR1952633, SRR1952632, SRR1952631,
SRR1952630, SRR1952629, SRR1952628, SRR1952627, SRR1951884, SRR1951857,
SRR1951835, SRR1951834, SRR1951825, SRR1951787, SRR1951772, SRR1951771,

SRR1951770, SRR1951769, SRR1951768, SRR1951767, SRR1951766, SRR1951765,
SRR1951764, SRR1951763, SRR1951762, SRR1951761, SRR1951610, SRR1951609,
SRR1951608, SRR1951607, SRR1951595, SRR1951594, SRR1951593, SRR1951592,
SRR1951591, SRR1951590, SRR1951589, SRR1951588, SRR1951587, SRR1951586,
SRR1951585, SRR1951584, SRR1951129, SRR1951128, SRR1951126, SRR1951099,
SRR1951094, SRR1951091, SRR1951088, SRR1951077, SRR1951071, SRR1951069,
SRR1951065, SRR1951064, SRR1951055, SRR1951027, SRR1950961, SRR1950960,
SRR1950890, SRR1950627, SRR1950612, SRR1950597, SRR1950595, SRR1950593,
SRR1950592, SRR1950591, SRR1950590, SRR1950588, SRR1950586, SRR1950585,
SRR1950584, SRR1950582, SRR1950581, SRR1950580, SRR1950579, SRR1950578,
SRR1950577, SRR1950575, SRR1950574, SRR1950572, SRR1950571, SRR1950570,
SRR1950569, SRR1950568, SRR1950567, SRR1950566, SRR1950565, SRR1950563,
SRR1950562, SRR1950561, SRR1950560, SRR1950558, SRR1950557, SRR1950556,
SRR1950555, SRR1950554, SRR1948350, SRR1948083, SRR1947861, SRR1947860,
SRR1947859, SRR1947858, SRR1947857, SRR1947856, SRR1947855, SRR1947854,
SRR1947853, SRR1947774, SRR1947773, SRR1947772, SRR1947771, SRR1947770,
SRR1947769, SRR1947768, SRR1947767, SRR1947766, SRR1947753, SRR1947752,
SRR1947751, SRR1947750, SRR1947749, SRR1947748, SRR1947747, SRR1947736,
SRR1947735, SRR1947688, SRR1947686, SRR1947683, SRR1947661, SRR1947656,
SRR1947655, SRR1947649, SRR1947648, SRR1947647, SRR1947483, SRR1947482,
SRR1947481, SRR1947382, SRR1947381, SRR1947380, SRR1947193, SRR1947191,
SRR1946881, SRR1946880, SRR1946878, SRR1946877, SRR1946876, SRR1946874,
SRR1946858, SRR1946855, SRR1946757, SRR1946756, SRR1946755, SRR1946754,
SRR1946753, SRR1946705, SRR1946704, SRR1945431, SRR1945329, SRR1945328,
SRR1945327, SRR1945326, SRR1945325, SRR1945324, SRR1945010, SRR1944906,
SRR1944905, SRR1944697, SRR1944695, SRR1944694, SRR1944693, SRR1944692,
SRR1944691, SRR1944690, SRR1944689, SRR1944585, SRR1944584, SRR1944583,
SRR1944582, SRR1944536, SRR1944534, SRR1944445, SRR1944444, SRR1944443,
SRR1944442, SRR1944441, SRR1944440, SRR1944439, SRR1944438, SRR1943052,
SRR1942955, SRR1942944, SRR1942914, SRR1942874, SRR1942873, SRR1942872,
SRR1942871, SRR1942870, SRR1942869, SRR1942868, SRR1942867, SRR1942866,
SRR1942865, SRR1942864, SRR1942863, SRR1942862, SRR1942861, SRR1942860,
SRR1942859, SRR1942858, SRR1942857, SRR1942856, SRR1942855, SRR1942854,
SRR1942853, SRR1942852, SRR1942851, SRR1942850, SRR1942849, SRR1942848,
SRR1942847, SRR1942846, SRR1942845, SRR1942844, SRR1942843, SRR1942842,
SRR1942841, SRR1942840, SRR1942839, SRR1931776, SRR1931773, SRR1931749,
SRR1931620, SRR1931619, SRR1931618, SRR1931617, SRR1931616, SRR1931615,
SRR1931614, SRR1930166, SRR1930150, SRR1930139, SRR1930127, SRR1930100,
SRR1930099, SRR1930097, SRR1929306, SRR1929305, SRR1929304, SRR1929303,
SRR1929302, SRR1929301, SRR1929300, SRR1929299, SRR1929298, SRR1929297,
SRR1928165, SRR1928150, SRR1928149, SRR1927171, SRR1927158, SRR1927156,
SRR1926310, SRR1926309, SRR1926308, SRR1926307, SRR1926306, SRR1926305,

SRR1926304, SRR1926303, SRR1926302, SRR1926301, SRR1926300, SRR1926299, SRR1926298, SRR1926297, SRR1926296, SRR1926295, SRR1926294, SRR1926293, SRR1926292, SRR1926291, SRR1926290, SRR1926289, SRR1926288, SRR1926287, SRR1926286, SRR1926285, SRR1926284, SRR1926283, SRR1926282, SRR1926281, SRR1926280, SRR1926279, SRR1926278, SRR1926277, SRR1926276, SRR1926275, SRR1926274, SRR1926273, SRR1926272, SRR1926271, SRR1926270, SRR1926269, SRR1926268, SRR1926267, SRR1926266, SRR1926265, SRR1926264, SRR1926263, SRR1926262, SRR1926261, SRR1926260, SRR1926259, SRR1926258, SRR1926257, SRR1926256, SRR1926255, SRR1926254, SRR1926253, SRR1926252, SRR1926251, SRR1926250, SRR1926249, SRR1926248, SRR1926247, SRR1926246, SRR1926245, SRR1926244, SRR1926243, SRR1926242, SRR1926241, SRR1926240, SRR1926239, SRR1926238, SRR1926237, SRR1926236, SRR1926235, SRR1926234, SRR1926233, SRR1926232, SRR1926231, SRR1926230, SRR1926229, SRR1926228, SRR1926227, SRR1926226, SRR1926225, SRR1926224, SRR1926223, SRR1926222, SRR1926221, SRR1926220, SRR1926219, SRR1926218, SRR1926217, SRR1926216, SRR1926215, SRR1926214, SRR1924580, SRR1924579, SRR1924554, SRR1924551, SRR1924264, SRR1924263, SRR1924256, SRR1924200, SRR1924199, SRR1924198, SRR1924196, SRR1924195, SRR1924194, SRR1924025, SRR1924020, SRR1924017, SRR1924012, SRR1924009, SRR1924003, SRR1923999, SRR1923996, SRR1923993, SRR1923985, SRR1923971, SRR1923968, SRR1923964, SRR1923959, SRR1923949, SRR1923946, SRR1923346, SRR1923344, SRR1923343, SRR1923342, SRR1923341, SRR1923339, SRR1922836, SRR1922835, SRR1922834, SRR1922833, SRR1922832, SRR1922831, SRR1920175, SRR1920173, SRR1920172, SRR1918821, SRR1918820, SRR1918819, SRR1918818, SRR1917391, SRR1917206, SRR1917205, SRR1917204, SRR1917203, SRR1917201, SRR1917200, SRR1917198, SRR1917196, SRR1917195, SRR1917193, SRR1917169, SRR1917168, SRR1917167, SRR1917166, SRR1917165, SRR1917164, SRR1917163, SRR1917162, SRR1917161, SRR1917160, SRR1917159, SRR1917158, SRR1917157, SRR1917155, SRR1917042, SRR1917041, SRR1917040, SRR1916396, SRR1916242, SRR1916192, SRR1915983, SRR1915982, SRR1915981, SRR1915980, SRR1915979, SRR1915978, SRR1915977, SRR1915976, SRR1915975, SRR1915974, SRR1915973, SRR1915972, SRR1915971, SRR1915970, SRR1915969, SRR1915967, SRR1915966, SRR1915965, SRR1915964, SRR1915963, SRR1915962, SRR1915961, SRR1915958, SRR1915957, SRR1915954, SRR1915953, SRR1915952, SRR1915004, SRR1914591, SRR1914590, SRR1914589, SRR1914588, SRR1914586, SRR1914585, SRR1914584, SRR1914583, SRR1914582, SRR1914581, SRR1914580, SRR1914579, SRR1914578, SRR1914577, SRR1914576, SRR1914575, SRR1914574, SRR1914338, SRR1914337, SRR1914335, SRR1914334, SRR1914333, SRR1914332, SRR1914329, SRR1913750, SRR1913749, SRR1913748, SRR1913747, SRR1913746, SRR1913745, SRR1913744, SRR1913743, SRR1913742, SRR1913741, SRR1913740, SRR1913739, SRR1913738, SRR1913737, SRR1913736, SRR1913735, SRR1913734, SRR1913733, SRR1913732, SRR1913731, SRR1913256, SRR1913075, SRR1910826, SRR1910825, SRR1910824, SRR1910823, SRR1910822, SRR1910821, SRR1910820, SRR1910819,

SRR1910818, SRR1910817, SRR1910816, SRR1910815, SRR1910814, SRR1910813, SRR1910812, SRR1910811, SRR1910810, SRR1910809, SRR1910808, SRR1910807, SRR1910806, SRR1910805, SRR1910804, SRR1910794, SRR1910567, SRR1910564, SRR1909704, SRR1909702, SRR1909654, SRR1909647, SRR1909494, SRR1909338, SRR1909336, SRR1909335, SRR1909127, SRR1909126, SRR1909030, SRR1909029, SRR1909028, SRR1909027, SRR1909026, SRR1909025, SRR1909024, SRR1909023, SRR1909022, SRR1909021, SRR1909020, SRR1909019, SRR1891234, SRR1890269, SRR1889422, SRR1888240, SRR1887380, SRR1886389, SRR1884878, SRR1883966, SRR1882919, SRR1881929, SRR1880959, SRR1879518, SRR1878107, SRR1876991, SRR1875520, SRR1874067, SRR1874061, SRR1874049, SRR1874047, SRR1874046, SRR1874043, SRR1874042, SRR1874041, SRR1874040, SRR1874039, SRR1874038, SRR1874037, SRR1874036, SRR1874035, SRR1874033, SRR1874031, SRR1874030, SRR1874028, SRR1874027, SRR1874026, SRR1874023, SRR1874021, SRR1873792, SRR1873791, SRR1873576, SRR1867903, SRR1867891, SRR1867889, SRR1867791, SRR1867789, SRR1867786, SRR1867784, SRR1867782, SRR1867781, SRR1867780, SRR1867779, SRR1867778, SRR1867777, SRR1867748, SRR1865385, SRR1865384, SRR1865383, SRR1865112, SRR1865111, SRR1865110, SRR1865090, SRR1864811, SRR1864810, SRR1864553, SRR1864506, SRR1863580, SRR1863177, SRR1863176, SRR1863175, SRR1863089, SRR1862850, SRR1856383, SRR1856382, SRR1856381, SRR1855783, SRR1855705, SRR1855694, SRR1854533, SRR1850716, SRR1850671, SRR1850670, SRR1850669, SRR1850668, SRR1850667, SRR1850666, SRR1850665, SRR1850664, SRR1850663, SRR1850662, SRR1850660, SRR1850659, SRR1850658, SRR1850657, SRR1850656, SRR1850655, SRR1850654, SRR1850653, SRR1850652, SRR1850651, SRR1850650, SRR1850649, SRR1850648, SRR1850647, SRR1850646, SRR1850645, SRR1850644, SRR1850643, SRR1850642, SRR1850641, SRR1850640, SRR1850639, SRR1850638, SRR1850637, SRR1850636, SRR1850635, SRR1850634, SRR1850633, SRR1850632, SRR1850631, SRR1850630, SRR1850629, SRR1850628, SRR1850627, SRR1850626, SRR1850625, SRR1850624, SRR1850623, SRR1850622, SRR1850621, SRR1850620, SRR1850619, SRR1850618, SRR1850617, SRR1850616, SRR1850587, SRR1849920, SRR1849919, SRR1849918, SRR1849917, SRR1849916, SRR1849915, SRR1849914, SRR1849913, SRR1849912, SRR1849911, SRR1849910, SRR1849909, SRR1849908, SRR1849907, SRR1849906, SRR1849905, SRR1849904, SRR1849903, SRR1849902, SRR1849901, SRR1849900, SRR1849899, SRR1849898, SRR1849897, SRR1849896, SRR1849895, SRR1849894, SRR1849893, SRR1849892, SRR1849891, SRR1849890, SRR1849889, SRR1849888, SRR1849887, SRR1849788, SRR1849787, SRR1849786, SRR1849785, SRR1849784, SRR1849783, SRR1849782, SRR1849781, SRR1849780, SRR1849779, SRR1849778, SRR1849777, SRR1849776, SRR1849775, SRR1849774, SRR1849773, SRR1849772, SRR1849771, SRR1849770, SRR1849769, SRR1849768, SRR1849767, SRR1849766, SRR1849765, SRR1845295, SRR1845149, SRR1845021, SRR1844393, SRR1844392, SRR1844375, SRR1844374, SRR1844357, SRR1844356, SRR1844355, SRR1844308, SRR1843831, SRR1842775, SRR1842774, SRR1842772, SRR1838014, SRR1838013, SRR1838012, SRR1838011,

SRR1837755, SRR1837754, SRR1837753, SRR1837752, SRR1837751, SRR1837750,
SRR1837749, SRR1837748, SRR1837747, SRR1837746, SRR1837745, SRR1837744,
SRR1837743, SRR1837742, SRR1837741, SRR1837740, SRR1837739, SRR1837738,
SRR1837737, SRR1837736, SRR1837735, SRR1837734, SRR1837733, SRR1837732,
SRR1837731, SRR1837730, SRR1837729, SRR1837728, SRR1837727, SRR1837726,
SRR1837725, SRR1837724, SRR1837723, SRR1837722, SRR1837721, SRR1837720,
SRR1837719, SRR1837718, SRR1837716, SRR1837715, SRR1837714, SRR1837713,
SRR1837712, SRR1837711, SRR1837710, SRR1837709, SRR1837708, SRR1837707,
SRR1837706, SRR1837705, SRR1837704, SRR1837703, SRR1837702, SRR1837701,
SRR1837700, SRR1837699, SRR1837698, SRR1837697, SRR1837696, SRR1837695,
SRR1837694, SRR1837693, SRR1837692, SRR1837691, SRR1837690, SRR1837689,
SRR1837688, SRR1837687, SRR1837686, SRR1837685, SRR1837684, SRR1837683,
SRR1837682, SRR1837681, SRR1837680, SRR1837679, SRR1837678, SRR1837677,
SRR1837676, SRR1837675, SRR1837674, SRR1837673, SRR1837672, SRR1837671,
SRR1837670, SRR1837669, SRR1837668, SRR1837667, SRR1837666, SRR1837665,
SRR1837664, SRR1837663, SRR1837662, SRR1837661, SRR1837660, SRR1837659,
SRR1837658, SRR1837657, SRR1837656, SRR1837655, SRR1837654, SRR1837653,
SRR1837652, SRR1837651, SRR1837650, SRR1837649, SRR1837648, SRR1837646,
SRR1837645, SRR1837644, SRR1837643, SRR1837642, SRR1837641, SRR1837640,
SRR1837639, SRR1837638, SRR1837637, SRR1837635, SRR1837634, SRR1837633,
SRR1837632, SRR1837631, SRR1837629, SRR1837628, SRR1837627, SRR1837626,
SRR1837624, SRR1837623, SRR1837622, SRR1837621, SRR1837620, SRR1837619,
SRR1837618, SRR1837617, SRR1837616, SRR1837615, SRR1837614, SRR1837613,
SRR1837612, SRR1837611, SRR1837610, SRR1837609, SRR1834661, SRR1832813,
SRR1832812, SRR1832811, SRR1832809, SRR1832808, SRR1829997, SRR1825653,
SRR1825648, SRR1824323, SRR1824322, SRR1823891, SRR1823890, SRR1823833,
SRR1823832, SRR1823831, SRR1823830, SRR1823829, SRR1823828, SRR1823827,
SRR1823826, SRR1823825, SRR1823824, SRR1823823, SRR1823822, SRR1823821,
SRR1823820, SRR1823819, SRR1823818, SRR1823817, SRR1823816, SRR1823060,
SRR1823059, SRR1822672, SRR1822671, SRR1822559, SRR1822558, SRR1822529,
SRR1822372, SRR1822370, SRR1822367, SRR1822359, SRR1822355, SRR1822329,
SRR1822320, SRR1822193, SRR1822192, SRR1821217, SRR1821204, SRR1821203,
SRR1821202, SRR1821201, SRR1821200, SRR1821199, SRR1821198, SRR1821197,
SRR1821196, SRR1821195, SRR1821194, SRR1821193, SRR1821192, SRR1821191,
SRR1821172, SRR1821156, SRR1821048, SRR1821008, SRR1820694, SRR1820693,
SRR1820692, SRR1820691, SRR1820678, SRR1820677, SRR1820332, SRR1820330,
SRR1820328, SRR1820326, SRR1820238, SRR1820235, SRR1820234, SRR1820233,
SRR1820232, SRR1820231, SRR1820230, SRR1820229, SRR1820228, SRR1820227,
SRR1820204, SRR1820161, SRR1820157, SRR1820149, SRR1819824, SRR1819823,
SRR1819822, SRR1819821, SRR1819820, SRR1819819, SRR1819818, SRR1819817,
SRR1819632, SRR1819630, SRR1819627, SRR1819625, SRR1819624, SRR1819621,
SRR1819617, SRR1819205, SRR1819204, SRR1819196, SRR1819193, SRR1818724,

SRR1818398, SRR1818397, SRR1818396, SRR1818395, SRR1818394, SRR1818393,
SRR1818392, SRR1818391, SRR1818390, SRR1818389, SRR1818388, SRR1818387,
SRR1818226, SRR1818148, SRR1816877, SRR1814205, SRR1814043, SRR1814042,
SRR1814041, SRR1814040, SRR1814039, SRR1814038, SRR1814037, SRR1814036,
SRR1812898, SRR1812897, SRR1812896, SRR1812895, SRR1812885, SRR1812884,
SRR1812377, SRR1812376, SRR1812375, SRR1811619, SRR1811564, SRR1811547,
SRR1811546, SRR1811545, SRR1811544, SRR1811543, SRR1811542, SRR1811541,
SRR1811540, SRR1811539, SRR1811538, SRR1811537, SRR1811536, SRR1811535,
SRR1811534, SRR1811533, SRR1811532, SRR1811531, SRR1811530, SRR1811529,
SRR1811528, SRR1811527, SRR1811526, SRR1811525, SRR1811524, SRR1811307,
SRR1811306, SRR1811305, SRR1811304, SRR1811303, SRR1811302, SRR1811301,
SRR1811300, SRR1811299, SRR1811298, SRR1811297, SRR1811296, SRR1811295,
SRR1811294, SRR1811293, SRR1811292, SRR1811291, SRR1811290, SRR1811289,
SRR1811288, SRR1811287, SRR1811286, SRR1811285, SRR1811284, SRR1811283,
SRR1811282, SRR1811281, SRR1811280, SRR1811279, SRR1811278, SRR1811277,
SRR1811276, SRR1811275, SRR1811274, SRR1811273, SRR1811272, SRR1811271,
SRR1811270, SRR1811269, SRR1811268, SRR1811267, SRR1811266, SRR1811265,
SRR1811264, SRR1811263, SRR1811262, SRR1811261, SRR1811260, SRR1811259,
SRR1811258, SRR1811257, SRR1811256, SRR1811255, SRR1811254, SRR1811253,
SRR1811252, SRR1811251, SRR1811250, SRR1811249, SRR1811248, SRR1811247,
SRR1811246, SRR1811245, SRR1811244, SRR1811243, SRR1811242, SRR1811241,
SRR1811240, SRR1811239, SRR1811238, SRR1811237, SRR1811236, SRR1811235,
SRR1811234, SRR1811233, SRR1811232, SRR1811231, SRR1811230, SRR1811229,
SRR1811228, SRR1811227, SRR1811226, SRR1811225, SRR1811224, SRR1811223,
SRR1811222, SRR1811221, SRR1811220, SRR1811219, SRR1811218, SRR1811217,
SRR1811216, SRR1811215, SRR1811214, SRR1811213, SRR1811212, SRR1811211,
SRR1810894, SRR1810893, SRR1810892, SRR1810891, SRR1810890, SRR1810889,
SRR1810888, SRR1810887, SRR1810886, SRR1810885, SRR1810884, SRR1810883,
SRR1810882, SRR1810881, SRR1810880, SRR1810879, SRR1810870, SRR1810868,
SRR1810865, SRR1810863, SRR1810842, SRR1810840, SRR1810839, SRR1810838,
SRR1810837, SRR1810836, SRR1810835, SRR1810834, SRR1810833, SRR1810789,
SRR1810788, SRR1810787, SRR1810786, SRR1810785, SRR1810784, SRR1810783,
SRR1810782, SRR1810781, SRR1810780, SRR1810779, SRR1810778, SRR1810146,
SRR1810085, SRR1810066, SRR1810065, SRR1810064, SRR1810063, SRR1810062,
SRR1810061, SRR1810060, SRR1810059, SRR1806846, SRR1806845, SRR1806844,
SRR1806843, SRR1806841, SRR1806840, SRR1806839, SRR1806838, SRR1806837,
SRR1806836, SRR1806835, SRR1806834, SRR1806833, SRR1806832, SRR1806831,
SRR1806830, SRR1806829, SRR1806828, SRR1806827, SRR1806826, SRR1806825,
SRR1806824, SRR1806822, SRR1806814, SRR1806811, SRR1806806, SRR1806801,
SRR1806794, SRR1806793, SRR1806792, SRR1806758, SRR1806756, SRR1806755,
SRR1806750, SRR1806746, SRR1806745, SRR1806742, SRR1806741, SRR1806740,
SRR1806739, SRR1805811, SRR1805791, SRR1805790, SRR1805741, SRR1805739,

SRR1805737, SRR1805735, SRR1805733, SRR1805731, SRR1805729, SRR1805727, SRR1805718, SRR1805340, SRR1805339, SRR1805072, SRR1802930, SRR1802929, SRR1802928, SRR1802927, SRR1802926, SRR1802925, SRR1802924, SRR1802923, SRR1802922, SRR1802921, SRR1802920, SRR1802775, SRR1802773, SRR1802742, SRR1802737, SRR1802734, SRR1802616, SRR1802173, SRR1802172, SRR1802171, SRR1802170, SRR1802169, SRR1802168, SRR1802167, SRR1802166, SRR1802165, SRR1802164, SRR1801257, SRR1801256, SRR1801255, SRR1801254, SRR1801253, SRR1801252, SRR1801251, SRR1801250, SRR1801249, SRR1801248, SRR1801247, SRR1801246, SRR1801245, SRR1801244, SRR1801243, SRR1801242, SRR1801241, SRR1801240, SRR1801239, SRR1801238, SRR1801237, SRR1801236, SRR1801235, SRR1801234, SRR1801233, SRR1801232, SRR1801231, SRR1801230, SRR1801229, SRR1801228, SRR1801227, SRR1801226, SRR1801225, SRR1801224, SRR1799573, SRR1799572, SRR1799571, SRR1799570, SRR1799569, SRR1799568, SRR1799561, SRR1799560, SRR1799559, SRR1799558, SRR1799557, SRR1799556, SRR1799555, SRR1799554, SRR1799553, SRR1799552, SRR1799551, SRR1799550, SRR1799549, SRR1799548, SRR1799547, SRR1799546, SRR1799545, SRR1799544, SRR1799543, SRR1799542, SRR1799541, SRR1799540, SRR1799538, SRR1799537, SRR1799536, SRR1799535, SRR1799534, SRR1799533, SRR1799532, SRR1799531, SRR1799530, SRR1799529, SRR1799528, SRR1799527, SRR1799526, SRR1799505, SRR1799504, SRR1799503, SRR1799502, SRR1799501, SRR1799500, SRR1799499, SRR1799498, SRR1799497, SRR1799496, SRR1799495, SRR1799494, SRR1799493, SRR1799492, SRR1799491, SRR1799490, SRR1799489, SRR1799488, SRR1799487, SRR1799486, SRR1799485, SRR1799484, SRR1799483, SRR1799482, SRR1799481, SRR1799480, SRR1799479, SRR1799478, SRR1799477, SRR1799476, SRR1799475, SRR1799474, SRR1799473, SRR1799472, SRR1799471, SRR1799470, SRR1799469, SRR1799468, SRR1799467, SRR1799466, SRR1799465, SRR1799464, SRR1799213, SRR1799212, SRR1799211, SRR1799210, SRR1799209, SRR1799208, SRR1799207, SRR1799206, SRR1799205, SRR1799204, SRR1799203, SRR1799202, SRR1799201, SRR1799200, SRR1799199, SRR1799198, SRR1799197, SRR1799196, SRR1799195, SRR1799194, SRR1799193, SRR1798557, SRR1798554, SRR1798551, SRR1798524, SRR1798089, SRR1798088, SRR1798087, SRR1798086, SRR1798085, SRR1798084, SRR1798083, SRR1798082, SRR1798081, SRR1798080, SRR1798079, SRR1798078, SRR1798077, SRR1798076, SRR1798075, SRR1798074, SRR1798073, SRR1798072, SRR1798071, SRR1798070, SRR1798069, SRR1798068, SRR1798067, SRR1798066, SRR1798065, SRR1798064, SRR1797879, SRR1797878, SRR1797830, SRR1797802, SRR1797801, SRR1797800, SRR1797799, SRR1797798, SRR1797797, SRR1797796, SRR1797792, SRR1797791, SRR1797790, SRR1797602, SRR1797601, SRR1797597, SRR1797582, SRR1797581, SRR1797580, SRR1797579, SRR1797578, SRR1797577, SRR1797576, SRR1797575, SRR1797574, SRR1797573, SRR1797363, SRR1797362, SRR1797361, SRR1796758, SRR1796757, SRR1796633, SRR1796632, SRR1796631, SRR1796630, SRR1796629, SRR1796628, SRR1796627, SRR1796626, SRR1796327, SRR1796326, SRR1796322, SRR1796321, SRR1796320, SRR1796319, SRR1795960, SRR1795959,

SRR1795006, SRR1795005, SRR1794796, SRR1794795, SRR1793927, SRR1793925, SRR1793924, SRR1793916, SRR1793914, SRR1793911, SRR1793909, SRR1793908, SRR1793876, SRR1793865, SRR1793864, SRR1793863, SRR1793860, SRR1793859, SRR1793858, SRR1793857, SRR1793856, SRR1793847, SRR1793834, SRR1793833, SRR1793832, SRR1793831, SRR1793826, SRR1793815, SRR1793509, SRR1793508, SRR1793507, SRR1793506, SRR1793505, SRR1793504, SRR1793503, SRR1793502, SRR1793501, SRR1793500, SRR1793499, SRR1793498, SRR1793497, SRR1793496, SRR1793495, SRR1793494, SRR1793493, SRR1793492, SRR1793491, SRR1793490, SRR1793489, SRR1793488, SRR1793487, SRR1793486, SRR1793371, SRR1793368, SRR1793367, SRR1793366, SRR1793365, SRR1793364, SRR1793363, SRR1793362, SRR1793319, SRR1793318, SRR1793317, SRR1793316, SRR1793315, SRR1793314, SRR1793312, SRR1793304, SRR1793303, SRR1793302, SRR1793239, SRR1793101, SRR1793093, SRR1792929, SRR1792928, SRR1792927, SRR1792926, SRR1792925, SRR1792924, SRR1790312, SRR1788806, SRR1788805, SRR1788794, SRR1788793, SRR1788792, SRR1787643, SRR1786036, SRR1786033, SRR1786028, SRR1786024, SRR1785890, SRR1785889, SRR1785888, SRR1785887, SRR1785884, SRR1785883, SRR1785880, SRR1785821, SRR1785819, SRR1785818, SRR1785808, SRR1785806, SRR1785804, SRR1785803, SRR1785762, SRR1785754, SRR1785747, SRR1785745, SRR1785744, SRR1785742, SRR1785734, SRR1785728, SRR1785721, SRR1785715, SRR1785709, SRR1783736, SRR1783712, SRR1783711, SRR1783710, SRR1783602, SRR1783601, SRR1783600, SRR1783599, SRR1783191, SRR1783190, SRR1783189, SRR1783188, SRR1783187, SRR1783186, SRR1783156, SRR1781784, SRR1781782, SRR1781778, SRR1781776, SRR1781773, SRR1781772, SRR1781771, SRR1781770, SRR1781769, SRR1781603, SRR1781602, SRR1781601, SRR1781559, SRR1781558, SRR1781557, SRR1781556, SRR1781555, SRR1781548, SRR1781543, SRR1781514, SRR1781510, SRR1781509, SRR1781507, SRR1779586, SRR1779585, SRR1779580, SRR1779579, SRR1779534, SRR1779533, SRR1779530, SRR1779529, SRR1779528, SRR1779526, SRR1779523, SRR1779522, SRR1779517, SRR1779510, SRR1779509, SRR1779508, SRR1779505, SRR1779504, SRR1779503, SRR1779501, SRR1779499, SRR1779498, SRR1779496, SRR1779494, SRR1779491, SRR1779490, SRR1779489, SRR1779487, SRR1779486, SRR1779485, SRR1779481, SRR1779466, SRR1779464, SRR1779462, SRR1779453, SRR1779452, SRR1779451, SRR1779449, SRR1779448, SRR1779445, SRR1779444, SRR1779442, SRR1779441, SRR1779438, SRR1779433, SRR1779432, SRR1779431, SRR1779430, SRR1779377, SRR1779375, SRR1779372, SRR1779368, SRR1779366, SRR1779365, SRR1779361, SRR1779359, SRR1779358, SRR1779356, SRR1779355, SRR1779354, SRR1779352, SRR1779351, SRR1779349, SRR1779346, SRR1779344, SRR1779343, SRR1779337, SRR1779328, SRR1779327, SRR1779326, SRR1779325, SRR1779324, SRR1779323, SRR1779322, SRR1779321, SRR1779320, SRR1779317, SRR1779312, SRR1779305, SRR1779300, SRR1779296, SRR1779291, SRR1779284, SRR1779279, SRR1779232, SRR1779225, SRR1779217, SRR1779199, SRR1779194, SRR1779188, SRR1779184, SRR1779182, SRR1779178, SRR1779173, SRR1779166, SRR1779159, SRR1779077, SRR1779076, SRR1779075,

SRR1779074, SRR1779072, SRR1779071, SRR1779070, SRR1779069, SRR1779068,
SRR1779067, SRR1779066, SRR1779065, SRR1779064, SRR1779063, SRR1779062,
SRR1779061, SRR1779060, SRR1779059, SRR1779058, SRR1779057, SRR1779056,
SRR1779055, SRR1779054, SRR1779053, SRR1779052, SRR1779051, SRR1779050,
SRR1779049, SRR1779048, SRR1779047, SRR1779046, SRR1779045, SRR1779044,
SRR1779043, SRR1779042, SRR1779041, SRR1779040, SRR1779039, SRR1779038,
SRR1779037, SRR1779036, SRR1779035, SRR1779034, SRR1779033, SRR1779032,
SRR1779031, SRR1779030, SRR1779029, SRR1779028, SRR1779026, SRR1779025,
SRR1779024, SRR1779023, SRR1779022, SRR1779021, SRR1779020, SRR1779019,
SRR1779018, SRR1779017, SRR1779016, SRR1779015, SRR1779014, SRR1779013,
SRR1779012, SRR1779011, SRR1779010, SRR1779009, SRR1779008, SRR1779005,
SRR1779004, SRR1779003, SRR1779002, SRR1779001, SRR1778999, SRR1778998,
SRR1778997, SRR1778996, SRR1778995, SRR1778994, SRR1778993, SRR1778992,
SRR1778991, SRR1778990, SRR1778988, SRR1778987, SRR1778986, SRR1778985,
SRR1778984, SRR1778983, SRR1778982, SRR1778981, SRR1778980, SRR1778979,
SRR1778978, SRR1778977, SRR1778976, SRR1778975, SRR1778974, SRR1778973,
SRR1778972, SRR1778971, SRR1778970, SRR1778969, SRR1778968, SRR1778967,
SRR1778966, SRR1778965, SRR1778964, SRR1778963, SRR1778962, SRR1778961,
SRR1778960, SRR1778959, SRR1778958, SRR1778957, SRR1778956, SRR1778955,
SRR1778954, SRR1778953, SRR1778952, SRR1778951, SRR1778950, SRR1778949,
SRR1778948, SRR1778947, SRR1778946, SRR1778945, SRR1778944, SRR1778943,
SRR1778942, SRR1778941, SRR1778940, SRR1778939, SRR1778938, SRR1778937,
SRR1778936, SRR1778935, SRR1778934, SRR1778933, SRR1778931, SRR1778930,
SRR1778929, SRR1778928, SRR1778926, SRR1778925, SRR1778923, SRR1778922,
SRR1778919, SRR1778918, SRR1778917, SRR1778916, SRR1778914, SRR1778913,
SRR1778912, SRR1778911, SRR1778910, SRR1778909, SRR1778908, SRR1778907,
SRR1778906, SRR1778905, SRR1778904, SRR1778903, SRR1778902, SRR1778901,
SRR1778900, SRR1778899, SRR1778898, SRR1778897, SRR1778896, SRR1778895,
SRR1778894, SRR1778893, SRR1778892, SRR1778891, SRR1778890, SRR1778889,
SRR1778888, SRR1778887, SRR1778886, SRR1778885, SRR1778884, SRR1778883,
SRR1778882, SRR1778881, SRR1778880, SRR1778879, SRR1778878, SRR1778877,
SRR1778876, SRR1778875, SRR1778874, SRR1778873, SRR1778872, SRR1778871,
SRR1778870, SRR1778869, SRR1778868, SRR1778867, SRR1778866, SRR1778865,
SRR1778864, SRR1778863, SRR1778862, SRR1778861, SRR1778860, SRR1778859,
SRR1778858, SRR1778857, SRR1778856, SRR1778855, SRR1778854, SRR1778853,
SRR1778852, SRR1778851, SRR1778850, SRR1778849, SRR1778848, SRR1778847,
SRR1778846, SRR1778845, SRR1778844, SRR1778843, SRR1778842, SRR1778841,
SRR1778840, SRR1778839, SRR1778838, SRR1778837, SRR1778836, SRR1778835,
SRR1778834, SRR1778833, SRR1778832, SRR1778831, SRR1778830, SRR1778829,
SRR1778828, SRR1778827, SRR1778826, SRR1778824, SRR1778822, SRR1778821,
SRR1778820, SRR1778819, SRR1778818, SRR1778817, SRR1778816, SRR1778815,
SRR1778814, SRR1778813, SRR1778812, SRR1778811, SRR1778810, SRR1778809,

SRR1778808, SRR1778807, SRR1778806, SRR1778805, SRR1778804, SRR1778803, SRR1778802, SRR1778801, SRR1778800, SRR1778799, SRR1778798, SRR1778797, SRR1778796, SRR1778795, SRR1778794, SRR1778793, SRR1778792, SRR1778791, SRR1778790, SRR1778789, SRR1778788, SRR1778787, SRR1778786, SRR1778785, SRR1778784, SRR1778783, SRR1778782, SRR1778781, SRR1778780, SRR1778779, SRR1778778, SRR1778777, SRR1778776, SRR1778775, SRR1778774, SRR1778773, SRR1778772, SRR1778771, SRR1778770, SRR1778769, SRR1778768, SRR1778767, SRR1778766, SRR1778765, SRR1778764, SRR1778763, SRR1778762, SRR1778761, SRR1778760, SRR1778759, SRR1778758, SRR1778757, SRR1778756, SRR1778755, SRR1778754, SRR1778753, SRR1778752, SRR1778751, SRR1778750, SRR1778749, SRR1778748, SRR1778747, SRR1778746, SRR1778745, SRR1778744, SRR1778743, SRR1778742, SRR1778741, SRR1778740, SRR1778739, SRR1778738, SRR1778737, SRR1778736, SRR1778735, SRR1778734, SRR1778733, SRR1778732, SRR1778731, SRR1778730, SRR1778729, SRR1778728, SRR1778727, SRR1778726, SRR1778725, SRR1778724, SRR1778723, SRR1778722, SRR1778721, SRR1778720, SRR1778719, SRR1778718, SRR1778717, SRR1778716, SRR1778715, SRR1778714, SRR1778713, SRR1778712, SRR1778711, SRR1778710, SRR1778709, SRR1778708, SRR1778707, SRR1778706, SRR1778705, SRR1778704, SRR1778703, SRR1778056, SRR1778044, SRR1778043, SRR1778042, SRR1778041, SRR1777904, SRR1777903, SRR1777901, SRR1777900, SRR1777894, SRR1777886, SRR1777879, SRR1777754, SRR1777753, SRR1777751, SRR1777738, SRR1777737, SRR1777736, SRR1777727, SRR1777726, SRR1777719, SRR1777714, SRR1777487, SRR1777486, SRR1777485, SRR1777484, SRR1777483, SRR1777478, SRR1777477, SRR1777470, SRR1777463, SRR1777459, SRR1777451, SRR1777450, SRR1777405, SRR1777403, SRR1777402, SRR1777388, SRR1777363, SRR1777172, SRR1777171, SRR1777170, SRR1777152, SRR1776899, SRR1776889, SRR1776880, SRR1776877, SRR1776865, SRR1776796, SRR1776573, SRR1776566, SRR1776535, SRR1776521, SRR1774246, SRR1774244, SRR1774241, SRR1774240, SRR1774238, SRR1774236, SRR1774233, SRR1774227, SRR1774211, SRR1774200, SRR1774148, SRR1774111, SRR1774109, SRR1774107, SRR1774106, SRR1774104, SRR1774094, SRR1774089, SRR1774085, SRR1774078, SRR1774069, SRR1774065, SRR1774051, SRR1774050, SRR1774049, SRR1774048, SRR1774047, SRR1773661, SRR1773660, SRR1773635, SRR1773632, SRR1773629, SRR1773597, SRR1773587, SRR1773586, SRR1773585, SRR1773584, SRR1773583, SRR1773582, SRR1773581, SRR1773580, SRR1773579, SRR1773578, SRR1773577, SRR1773576, SRR1773575, SRR1773574, SRR1773573, SRR1773572, SRR1773571, SRR1773570, SRR1773569, SRR1773568, SRR1773567, SRR1773566, SRR1773565, SRR1773564, SRR1773563, SRR1773562, SRR1773561, SRR1773560, SRR1773559, SRR1773558, SRR1773557, SRR1773556, SRR1773555, SRR1773542, SRR1773532, SRR1773531, SRR1773530, SRR1773529, SRR1773528, SRR1773527, SRR1773526, SRR1773525, SRR1773524, SRR1773523, SRR1773522, SRR1773521, SRR1773520, SRR1773519, SRR1773518, SRR1773517, SRR1773493, SRR1773424, SRR1773422, SRR1773421, SRR1773420, SRR1772440, SRR1772400, SRR1772398, SRR1772397, SRR1772396,

SRR1772395, SRR1772391, SRR1772385, SRR1772344, SRR1772342, SRR1772341,
SRR1772297, SRR1772284, SRR1772255, SRR1772254, SRR1772253, SRR1772252,
SRR1772251, SRR1772250, SRR1772244, SRR1772242, SRR1772241, SRR1772240,
SRR1772238, SRR1772237, SRR1772236, SRR1772235, SRR1772234, SRR1772233,
SRR1772232, SRR1772231, SRR1772230, SRR1772229, SRR1772228, SRR1772227,
SRR1772226, SRR1772225, SRR1772224, SRR1772223, SRR1772174, SRR1772147,
SRR1772146, SRR1771853, SRR1771852, SRR1771851, SRR1771848, SRR1771847,
SRR1771846, SRR1771782, SRR1771781, SRR1771780, SRR1771779, SRR1771778,
SRR1771777, SRR1771776, SRR1771775, SRR1771546, SRR1771545, SRR1771544,
SRR1771543, SRR1771542, SRR1771541, SRR1771539, SRR1771523, SRR1771511,
SRR1771445, SRR1771351, SRR1771350, SRR1771349, SRR1771348, SRR1771347,
SRR1771346, SRR1771345, SRR1771344, SRR1771343, SRR1771342, SRR1771341,
SRR1771340, SRR1770537, SRR1770536, SRR1770488, SRR1770483, SRR1770482,
SRR1770418, SRR1770417, SRR1770416, SRR1770415, SRR1770398, SRR1770397,
SRR1770395, SRR1770394, SRR1770392, SRR1770391, SRR1770390, SRR1770389,
SRR1770387, SRR1770386, SRR1770385, SRR1770384, SRR1770383, SRR1770382,
SRR1770381, SRR1770380, SRR1770379, SRR1770378, SRR1770377, SRR1770376,
SRR1770375, SRR1770374, SRR1770373, SRR1770372, SRR1770371, SRR1770370,
SRR1770369, SRR1770368, SRR1770367, SRR1770366, SRR1770365, SRR1770364,
SRR1770363, SRR1770130, SRR1770121, SRR1770120, SRR1770119, SRR1770115,
SRR1770114, SRR1770112, SRR1770110, SRR1770109, SRR1770108, SRR1770107,
SRR1770106, SRR1770105, SRR1770103, SRR1768524, SRR1768523, SRR1768522,
SRR1768521, SRR1768520, SRR1768519, SRR1768518, SRR1768517, SRR1768516,
SRR1768515, SRR1768514, SRR1768513, SRR1768512, SRR1768511, SRR1768510,
SRR1768509, SRR1768508, SRR1768507, SRR1768506, SRR1768505, SRR1768504,
SRR1768462, SRR1768422, SRR1768411, SRR1768410, SRR1768409, SRR1768408,
SRR1768407, SRR1768406, SRR1768403, SRR1768402, SRR1768401, SRR1768384,
SRR1768383, SRR1768370, SRR1767933, SRR1767932, SRR1767931, SRR1767930,
SRR1767929, SRR1767928, SRR1767927, SRR1767926, SRR1767796, SRR1767795,
SRR1767794, SRR1767793, SRR1767792, SRR1767791, SRR1767790, SRR1767773,
SRR1767462, SRR1767461, SRR1767460, SRR1767459, SRR1767458, SRR1767457,
SRR1767354, SRR1767353, SRR1767352, SRR1767351, SRR1767350, SRR1767349,
SRR1767348, SRR1767347, SRR1767346, SRR1767345, SRR1767344, SRR1767343,
SRR1767342, SRR1767341, SRR1767302, SRR1767301, SRR1767300, SRR1767299,
SRR1767298, SRR1767236, SRR1767234, SRR1766414, SRR1766410, SRR1766408,
SRR1766407, SRR1766406, SRR1766405, SRR1766402, SRR1766401, SRR1766400,
SRR1766399, SRR1766398, SRR1766397, SRR1766396, SRR1766395, SRR1766394,
SRR1766389, SRR1766334, SRR1766333, SRR1766332, SRR1766331, SRR1766330,
SRR1766329, SRR1766312, SRR1766311, SRR1766310, SRR1766308, SRR1766307,
SRR1765913, SRR1765909, SRR1765898, SRR1765896, SRR1765783, SRR1765672,
SRR1765380, SRR1765379, SRR1765360, SRR1765340, SRR1765339, SRR1765338,
SRR1765337, SRR1764572, SRR1764571, SRR1764570, SRR1764569, SRR1764568,

SRR1764567, SRR1764566, SRR1764565, SRR1764564, SRR1764563, SRR1763901, SRR1763900, SRR1763299, SRR1763298, SRR1763297, SRR1763245, SRR1763244, SRR1763243, SRR1763242, SRR1763107, SRR1763106, SRR1761795, SRR1761794, SRR1761793, SRR1761792, SRR1761791, SRR1761790, SRR1761789, SRR1761788, SRR1761787, SRR1761786, SRR1761785, SRR1761784, SRR1761783, SRR1761782, SRR1761781, SRR1761780, SRR1761531, SRR1761530, SRR1761529, SRR1761528, SRR1761523, SRR1761522, SRR1761521, SRR1761520, SRR1761519, SRR1761518, SRR1761517, SRR1761516, SRR1761515, SRR1761514, SRR1761513, SRR1761512, SRR1761511, SRR1761510, SRR1761509, SRR1761508, SRR1761507, SRR1761506, SRR1760653, SRR1760652, SRR1760532, SRR1760531, SRR1760530, SRR1760528, SRR1760527, SRR1760526, SRR1760525, SRR1760524, SRR1760523, SRR1760439, SRR1760438, SRR1760436, SRR1760435, SRR1760433, SRR1760432, SRR1760430, SRR1760429, SRR1760428, SRR1760271, SRR1760270, SRR1760213, SRR1760212, SRR1760211, SRR1760210, SRR1760209, SRR1760208, SRR1760206, SRR1760205, SRR1760204, SRR1760203, SRR1760202, SRR1760201, SRR1760200, SRR1760199, SRR1760198, SRR1760196, SRR1760195, SRR1760194, SRR1760193, SRR1760192, SRR1760191, SRR1760190, SRR1760189, SRR1760188, SRR1760187, SRR1760186, SRR1760185, SRR1760184, SRR1760183, SRR1760182, SRR1760181, SRR1760180, SRR1760179, SRR1760178, SRR1760177, SRR1760176, SRR1760175, SRR1760174, SRR1760173, SRR1760172, SRR1760171, SRR1760170, SRR1760160, SRR1760141, SRR1760129, SRR1760106, SRR1760096, SRR1760095, SRR1760094, SRR1760091, SRR1759788, SRR1759787, SRR1759786, SRR1759785, SRR1759781, SRR1759291, SRR1759290, SRR1759289, SRR1759288, SRR1759287, SRR1759286, SRR1759285, SRR1759284, SRR1759283, SRR1759282, SRR1759281, SRR1759280, SRR1759279, SRR1759278, SRR1758829, SRR1758828, SRR1758152, SRR1758140, SRR1758128, SRR1758104, SRR1758091, SRR1758079, SRR1758067, SRR1758055, SRR1758044, SRR1758029, SRR1758021, SRR1758014, SRR1757990, SRR1757978, SRR1757965, SRR1757569, SRR1756956, SRR1756762, SRR1756757, SRR1756740, SRR1756209, SRR1754988, SRR1754987, SRR1754986, SRR1754983, SRR1754981, SRR1754980, SRR1754979, SRR1754978, SRR1754977, SRR1754976, SRR1754975, SRR1754913, SRR1754912, SRR1754911, SRR1754910, SRR1754908, SRR1754906, SRR1754903, SRR1754900, SRR1754897, SRR1754116, SRR1754115, SRR1754114, SRR1754113, SRR1754112, SRR1754111, SRR1754110, SRR1754109, SRR1754108, SRR1754107, SRR1754106, SRR1754105, SRR1754104, SRR1754103, SRR1754102, SRR1754101, SRR1754100, SRR1754099, SRR1754098, SRR1754097, SRR1754096, SRR1754095, SRR1754094, SRR1754093, SRR1754092, SRR1754091, SRR1754090, SRR1754089, SRR1754088, SRR1754087, SRR1754086, SRR1754085, SRR1754084, SRR1754083, SRR1754082, SRR1754081, SRR1754080, SRR1754079, SRR1754078, SRR1754077, SRR1754076, SRR1754075, SRR1754074, SRR1754073, SRR1754072, SRR1754071, SRR1754070, SRR1754069, SRR1754068, SRR1754067, SRR1754066, SRR1754065, SRR1754064, SRR1754063, SRR1754062, SRR1754061, SRR1754060, SRR1754059, SRR1754058, SRR1754057, SRR1754056, SRR1754055, SRR1754054, SRR1754053,

SRR1754052, SRR1754051, SRR1754050, SRR1754049, SRR1754048, SRR1754047, SRR1754046, SRR1754045, SRR1754044, SRR1754043, SRR1754042, SRR1754041, SRR1754040, SRR1754039, SRR1754038, SRR1754037, SRR1754036, SRR1754035, SRR1754034, SRR1754033, SRR1754032, SRR1754031, SRR1754030, SRR1754029, SRR1754028, SRR1754027, SRR1754026, SRR1754025, SRR1754024, SRR1754023, SRR1754022, SRR1754021, SRR1753108, SRR1753107, SRR1753105, SRR1753104, SRR1752764, SRR1752197, SRR1752196, SRR1752195, SRR1752194, SRR1752193, SRR1752192, SRR1752191, SRR1752190, SRR1752189, SRR1752188, SRR1752187, SRR1752186, SRR1752185, SRR1752184, SRR1752183, SRR1752182, SRR1752181, SRR1752180, SRR1752179, SRR1752178, SRR1752177, SRR1752176, SRR1752078, SRR1752076, SRR1752062, SRR1748383, SRR1748382, SRR1748381, SRR1748380, SRR1748379, SRR1748378, SRR1748377, SRR1748376, SRR1748375, SRR1748374, SRR1748373, SRR1748372, SRR1748371, SRR1748370, SRR1748369, SRR1748368, SRR1748367, SRR1748366, SRR1748365, SRR1748364, SRR1748363, SRR1748362, SRR1748361, SRR1748360, SRR1748359, SRR1748358, SRR1748357, SRR1748356, SRR1748355, SRR1748354, SRR1748353, SRR1748352, SRR1748351, SRR1748350, SRR1748349, SRR1748348, SRR1748347, SRR1748346, SRR1748345, SRR1748344, SRR1748343, SRR1748342, SRR1748341, SRR1748340, SRR1748339, SRR1748338, SRR1748337, SRR1748336, SRR1748335, SRR1748334, SRR1748333, SRR1748332, SRR1748331, SRR1748330, SRR1748329, SRR1748328, SRR1748327, SRR1748326, SRR1748325, SRR1748324, SRR1748323, SRR1748322, SRR1748321, SRR1748320, SRR1748319, SRR1748318, SRR1748317, SRR1748316, SRR1748315, SRR1748314, SRR1748313, SRR1748312, SRR1747974, SRR1747973, SRR1747851, SRR1747850, SRR1747849, SRR1747848, SRR1747847, SRR1747846, SRR1747845, SRR1747844, SRR1747843, SRR1747834, SRR1747833, SRR1747832, SRR1747831, SRR1747830, SRR1747829, SRR1747828, SRR1747827, SRR1747826, SRR1747142, SRR1747140, SRR1747136, SRR1747135, SRR1747134, SRR1747133, SRR1747132, SRR1747126, SRR1747125, SRR1747123, SRR1747122, SRR1747107, SRR1747105, SRR1747103, SRR1747102, SRR1747097, SRR1747096, SRR1747095, SRR1747094, SRR1747093, SRR1747077, SRR1747072, SRR1747017, SRR1746765, SRR1746764, SRR1746763, SRR1746762, SRR1746761, SRR1746760, SRR1746759, SRR1746758, SRR1745859, SRR1745812, SRR1745802, SRR1745801, SRR1745800, SRR1745798, SRR1745795, SRR1745794, SRR1745793, SRR1745792, SRR1745791, SRR1745790, SRR1745789, SRR1745788, SRR1745786, SRR1745785, SRR1745784, SRR1745783, SRR1745782, SRR1745781, SRR1745779, SRR1745775, SRR1745765, SRR1745640, SRR1745639, SRR1745637, SRR1745636, SRR1745635, SRR1745633, SRR1745417, SRR1745416, SRR1745415, SRR1745414, SRR1745413, SRR1745412, SRR1744412, SRR1744411, SRR1744410, SRR1744409, SRR1744408, SRR1744407, SRR1744406, SRR1744405, SRR1744404, SRR1744403, SRR1744402, SRR1744401, SRR1744400, SRR1744399, SRR1744398, SRR1744397, SRR1744396, SRR1744395, SRR1744394, SRR1744392, SRR1744391, SRR1744390, SRR1744389, SRR1744387, SRR1744386, SRR1744385, SRR1744384, SRR1744383, SRR1744382, SRR1744381, SRR1744380, SRR1744379,

SRR1744378, SRR1744377, SRR1744376, SRR1744375, SRR1744374, SRR1744373, SRR1744372, SRR1744371, SRR1744370, SRR1744369, SRR1744368, SRR1744367, SRR1744366, SRR1744365, SRR1744364, SRR1744363, SRR1744362, SRR1744361, SRR1744360, SRR1744359, SRR1744358, SRR1744357, SRR1744356, SRR1744355, SRR1744354, SRR1744353, SRR1744352, SRR1744351, SRR1744350, SRR1744128, SRR1744124, SRR1744123, SRR1744122, SRR1744121, SRR1744120, SRR1744119, SRR1744117, SRR1744115, SRR1744114, SRR1744112, SRR1744110, SRR1744106, SRR1744091, SRR1744084, SRR1744069, SRR1744068, SRR1743455, SRR1743089, SRR1743087, SRR1743014, SRR1743013, SRR1743012, SRR1743010, SRR1743009, SRR1743008, SRR1743007, SRR1740460, SRR1740459, SRR1740458, SRR1740457, SRR1740456, SRR1740455, SRR1740454, SRR1740453, SRR1740452, SRR1740451, SRR1740450, SRR1740449, SRR1740448, SRR1740447, SRR1740446, SRR1740445, SRR1740444, SRR1740443, SRR1740442, SRR1740441, SRR1740440, SRR1740439, SRR1740438, SRR1740437, SRR1740436, SRR1740435, SRR1740434, SRR1740433, SRR1740432, SRR1740431, SRR1740430, SRR1740429, SRR1740428, SRR1740427, SRR1740426, SRR1740425, SRR1740424, SRR1740423, SRR1740422, SRR1740421, SRR1740420, SRR1740419, SRR1740418, SRR1740417, SRR1740416, SRR1740415, SRR1740414, SRR1740413, SRR1740412, SRR1740411, SRR1740410, SRR1740409, SRR1740408, SRR1740407, SRR1740406, SRR1740405, SRR1740404, SRR1740403, SRR1740402, SRR1740401, SRR1740025, SRR1740024, SRR1740023, SRR1740003, SRR1739738, SRR1738659, SRR1738255, SRR1738215, SRR1738151, SRR1738150, SRR1738149, SRR1738148, SRR1738147, SRR1738146, SRR1738145, SRR1738144, SRR1738143, SRR1738142, SRR1738141, SRR1738140, SRR1738139, SRR1738138, SRR1738137, SRR1738136, SRR1738135, SRR1738134, SRR1738133, SRR1738132, SRR1738131, SRR1738130, SRR1738129, SRR1738128, SRR1738127, SRR1738126, SRR1738125, SRR1738123, SRR1738122, SRR1738121, SRR1738120, SRR1738119, SRR1738118, SRR1738117, SRR1738116, SRR1738115, SRR1738114, SRR1738113, SRR1738112, SRR1738111, SRR1738110, SRR1738109, SRR1738108, SRR1738107, SRR1738106, SRR1738105, SRR1738014, SRR1738013, SRR1738012, SRR1738011, SRR1738010, SRR1738009, SRR1738008, SRR1738007, SRR1738006, SRR1738005, SRR1738004, SRR1738003, SRR1738002, SRR1738001, SRR1738000, SRR1737999, SRR1737998, SRR1737997, SRR1737996, SRR1737995, SRR1737994, SRR1737993, SRR1737992, SRR1737991, SRR1737990, SRR1737989, SRR1737988, SRR1737987, SRR1737986, SRR1737985, SRR1737984, SRR1737983, SRR1737982, SRR1737981, SRR1737980, SRR1737979, SRR1737747, SRR1737746, SRR1737745, SRR1737526, SRR1736734, SRR1736733, SRR1736732, SRR1736731, SRR1736730, SRR1736729, SRR1736728, SRR1736727, SRR1736726, SRR1736724, SRR1736723, SRR1736722, SRR1736621, SRR1736620, SRR1736619, SRR1736618, SRR1736615, SRR1736611, SRR1736610, SRR1736608, SRR1736607, SRR1736606, SRR1736603, SRR1736602, SRR1736600, SRR1736599, SRR1736597, SRR1736596, SRR1736595, SRR1736593, SRR1736592, SRR1736590, SRR1736589, SRR1736588, SRR1736587, SRR1736586, SRR1736585, SRR1735533, SRR1735532, SRR1735531, SRR1735530, SRR1735529,

SRR1735528, SRR1735527, SRR1735526, SRR1735525, SRR1735524, SRR1735523, SRR1735522, SRR1735521, SRR1735517, SRR1735515, SRR1735513, SRR1735489, SRR1735394, SRR1734725, SRR1734724, SRR1734712, SRR1734711, SRR1734710, SRR1734709, SRR1734708, SRR1734707, SRR1734706, SRR1734705, SRR1734704, SRR1734703, SRR1734702, SRR1734701, SRR1734700, SRR1734699, SRR1734698, SRR1734697, SRR1734696, SRR1734695, SRR1734694, SRR1734693, SRR1734692, SRR1734691, SRR1734690, SRR1734689, SRR1734680, SRR1734327, SRR1734326, SRR1734325, SRR1734324, SRR1734323, SRR1734322, SRR1734321, SRR1734320, SRR1734319, SRR1734318, SRR1734317, SRR1734316, SRR1734315, SRR1734314, SRR1734313, SRR1734312, SRR1734311, SRR1734310, SRR1734309, SRR1734308, SRR1734307, SRR1734306, SRR1734305, SRR1734304, SRR1734303, SRR1734302, SRR1734301, SRR1734300, SRR1734299, SRR1734298, SRR1732736, SRR1732735, SRR1732734, SRR1732733, SRR1732732, SRR1732731, SRR1732730, SRR1732729, SRR1732728, SRR1732727, SRR1732358, SRR1732356, SRR1732355, SRR1732308, SRR1732307, SRR1732294, SRR1732293, SRR1732292, SRR1732291, SRR1732290, SRR1732271, SRR1732270, SRR1732268, SRR1732267, SRR1732266, SRR1732265, SRR1732263, SRR1732213, SRR1732100, SRR1732098, SRR1731806, SRR1731699, SRR1731531, SRR1731297, SRR1731295, SRR1731293, SRR1731291, SRR1731290, SRR1731288, SRR1731287, SRR1731222, SRR1731221, SRR1728737, SRR1728736, SRR1728656, SRR1728655, SRR1728654, SRR1728653, SRR1728566, SRR1728309, SRR1728119, SRR1727532, SRR1727531, SRR1727530, SRR1727529, SRR1727004, SRR1727002, SRR1727001, SRR1727000, SRR1726999, SRR1726998, SRR1726997, SRR1726996, SRR1726995, SRR1726994, SRR1726993, SRR1726992, SRR1726991, SRR1726990, SRR1726989, SRR1726988, SRR1726987, SRR1726986, SRR1726985, SRR1726984, SRR1726983, SRR1726982, SRR1726981, SRR1726980, SRR1726979, SRR1726978, SRR1726977, SRR1726976, SRR1726975, SRR1726974, SRR1726973, SRR1726972, SRR1726971, SRR1726970, SRR1726969, SRR1726968, SRR1726967, SRR1726966, SRR1726965, SRR1726964, SRR1726963, SRR1726612, SRR1726611, SRR1726610, SRR1726609, SRR1726608, SRR1726607, SRR1726606, SRR1726605, SRR1726604, SRR1726603, SRR1726602, SRR1726601, SRR1726600, SRR1726599, SRR1726598, SRR1726597, SRR1726596, SRR1726595, SRR1726594, SRR1726593, SRR1726592, SRR1726591, SRR1726590, SRR1726589, SRR1726588, SRR1726587, SRR1726586, SRR1726585, SRR1726584, SRR1726583, SRR1726582, SRR1726581, SRR1726580, SRR1726579, SRR1726578, SRR1726577, SRR1726576, SRR1726575, SRR1726574, SRR1726573, SRR1726572, SRR1726571, SRR1726570, SRR1726568, SRR1726567, SRR1726566, SRR1726565, SRR1726564, SRR1726563, SRR1726562, SRR1726561, SRR1726560, SRR1726559, SRR1726558, SRR1726557, SRR1726556, SRR1726555, SRR1726554, SRR1726553, SRR1726552, SRR1726551, SRR1726550, SRR1726549, SRR1726548, SRR1726547, SRR1726546, SRR1726545, SRR1726544, SRR1726543, SRR1726542, SRR1726541, SRR1726540, SRR1726539, SRR1726538, SRR1726537, SRR1726536, SRR1726535, SRR1726534, SRR1726533, SRR1726532, SRR1726531, SRR1726530, SRR1726529, SRR1726528, SRR1726527, SRR1726526,

SRR1726525, SRR1726524, SRR1726523, SRR1726522, SRR1726521, SRR1726520,
SRR1726519, SRR1726518, SRR1726517, SRR1726516, SRR1726515, SRR1726514,
SRR1726513, SRR1726512, SRR1726511, SRR1726510, SRR1726509, SRR1726508,
SRR1726507, SRR1726506, SRR1726505, SRR1726504, SRR1726503, SRR1726502,
SRR1726501, SRR1726500, SRR1726499, SRR1726498, SRR1726497, SRR1726496,
SRR1726495, SRR1726494, SRR1726493, SRR1726492, SRR1726491, SRR1726490,
SRR1726489, SRR1726488, SRR1726487, SRR1726486, SRR1726485, SRR1726484,
SRR1726483, SRR1726482, SRR1726481, SRR1726480, SRR1726479, SRR1726478,
SRR1726477, SRR1726476, SRR1726475, SRR1726474, SRR1726473, SRR1726472,
SRR1726471, SRR1726470, SRR1726469, SRR1725543, SRR1724943, SRR1724903,
SRR1724902, SRR1724900, SRR1724899, SRR1724089, SRR1722713, SRR1722455,
SRR1722390, SRR1722297, SRR1722296, SRR1722295, SRR1722294, SRR1722292,
SRR1722291, SRR1722290, SRR1722230, SRR1722229, SRR1722228, SRR1722212,
SRR1722166, SRR1722165, SRR1722164, SRR1722163, SRR1722162, SRR1722161,
SRR1722160, SRR1722159, SRR1722001, SRR1721962, SRR1720765, SRR1720763,
SRR1720762, SRR1720758, SRR1718919, SRR1718918, SRR1718917, SRR1718916,
SRR1718915, SRR1718914, SRR1714992, SRR1714991, SRR1714932, SRR1714874,
SRR1713304, SRR1713303, SRR1713301, SRR1713245, SRR1713244, SRR1712666,
SRR1712665, SRR1712663, SRR1712661, SRR1712659, SRR1712657, SRR1712654,
SRR1709075, SRR1709074, SRR1709073, SRR1709072, SRR1709071, SRR1709070,
SRR1709068, SRR1709067, SRR1709066, SRR1709065, SRR1709064, SRR1709063,
SRR1709062, SRR1709061, SRR1709060, SRR1709053, SRR1709052, SRR1709051,
SRR1709050, SRR1709049, SRR1709048, SRR1708904, SRR1708903, SRR1708902,
SRR1708901, SRR1708900, SRR1708899, SRR1708663, SRR1708662, SRR1708660,
SRR1708045, SRR1708044, SRR1708043, SRR1708042, SRR1708041, SRR1708040,
SRR1708039, SRR1708038, SRR1708037, SRR1708036, SRR1708035, SRR1708034,
SRR1708033, SRR1708032, SRR1708031, SRR1708030, SRR1708029, SRR1708028,
SRR1708027, SRR1708026, SRR1708025, SRR1708024, SRR1708023, SRR1708022,
SRR1708021, SRR1708020, SRR1708019, SRR1708018, SRR1708017, SRR1708016,
SRR1708015, SRR1708014, SRR1708013, SRR1708012, SRR1708011, SRR1708010,
SRR1708009, SRR1708008, SRR1708007, SRR1708006, SRR1708005, SRR1708004,
SRR1708003, SRR1708002, SRR1708001, SRR1708000, SRR1707999, SRR1707998,
SRR1707997, SRR1707996, SRR1707995, SRR1707993, SRR1707992, SRR1707991,
SRR1707990, SRR1707989, SRR1707988, SRR1707987, SRR1707986, SRR1707985,
SRR1707984, SRR1707983, SRR1707982, SRR1707633, SRR1707632, SRR1707631,
SRR1707630, SRR1707410, SRR1707403, SRR1707400, SRR1706671, SRR1706670,
SRR1706669, SRR1706668, SRR1706666, SRR1706665, SRR1706650, SRR1706595,
SRR1706594, SRR1706593, SRR1706592, SRR1706555, SRR1706554, SRR1706553,
SRR1706552, SRR1706551, SRR1706550, SRR1706549, SRR1706548, SRR1706547,
SRR1706546, SRR1706545, SRR1706544, SRR1706194, SRR1706192, SRR1706187,
SRR1705624, SRR1703437, SRR1703436, SRR1703435, SRR1703433, SRR1703432,
SRR1703416, SRR1703367, SRR1703354, SRR1703353, SRR1703351, SRR1702851,

SRR1702850, SRR1702849, SRR1702848, SRR1702847, SRR1702846, SRR1702845, SRR1702844, SRR1702843, SRR1702842, SRR1702841, SRR1702840, SRR1702486, SRR1702062, SRR1701979, SRR1701857, SRR1701054, SRR1701053, SRR1701052, SRR1701051, SRR1701050, SRR1701048, SRR1700873, SRR1700819, SRR1700630, SRR1699442, SRR1698355, SRR1698239, SRR1698238, SRR1698235, SRR1698234, SRR1698233, SRR1698232, SRR1698231, SRR1698229, SRR1698228, SRR1698227, SRR1698226, SRR1698225, SRR1698223, SRR1698179, SRR1698133, SRR1698132, SRR1698131, SRR1698130, SRR1698129, SRR1698127, SRR1698126, SRR1698125, SRR1698124, SRR1698123, SRR1698118, SRR1698117, SRR1698116, SRR1698115, SRR1698114, SRR1698113, SRR1698112, SRR1698110, SRR1698109, SRR1698108, SRR1698107, SRR1698106, SRR1698105, SRR1698101, SRR1697357, SRR1697350, SRR1697349, SRR1697348, SRR1697347, SRR1697346, SRR1696855, SRR1695732, SRR1695592, SRR1695497, SRR1695456, SRR1695455, SRR1695406, SRR1695405, SRR1695301, SRR1695197, SRR1695194, SRR1695193, SRR1695192, SRR1695191, SRR1695190, SRR1695189, SRR1695188, SRR1695187, SRR1695186, SRR1695185, SRR1695184, SRR1695183, SRR1695182, SRR1695181, SRR1695180, SRR1695179, SRR1695178, SRR1695177, SRR1695176, SRR1695175, SRR1695174, SRR1695173, SRR1695171, SRR1695170, SRR1695169, SRR1695168, SRR1695167, SRR1695166, SRR1695165, SRR1695164, SRR1695163, SRR1695162, SRR1695161, SRR1695160, SRR1695147, SRR1695146, SRR1695145, SRR1695143, SRR1694250, SRR1694203, SRR1694099, SRR1694098, SRR1693844, SRR1693842, SRR1693841, SRR1693840, SRR1693829, SRR1693416, SRR1693374, SRR1693363, SRR1693248, SRR1693239, SRR1693238, SRR1693237, SRR1693236, SRR1693235, SRR1693234, SRR1693230, SRR1693197, SRR1693189, SRR1693188, SRR1693187, SRR1693184, SRR1693183, SRR1693182, SRR1692297, SRR1692096, SRR1691481, SRR1691468, SRR1691456, SRR1691455, SRR1691452, SRR1691440, SRR1691359, SRR1691358, SRR1691346, SRR1691340, SRR1691321, SRR1691309, SRR1691308, SRR1691296, SRR1691284, SRR1691283, SRR1691281, SRR1691280, SRR1691279, SRR1691278, SRR1691277, SRR1691276, SRR1691275, SRR1691273, SRR1691272, SRR1691271, SRR1691270, SRR1691269, SRR1691268, SRR1691267, SRR1691266, SRR1691265, SRR1691264, SRR1691263, SRR1691262, SRR1691260, SRR1691259, SRR1691258, SRR1691257, SRR1691256, SRR1691255, SRR1691254, SRR1691253, SRR1691252, SRR1691251, SRR1691250, SRR1691249, SRR1691248, SRR1691247, SRR1691245, SRR1691244, SRR1691243, SRR1691242, SRR1691241, SRR1691240, SRR1691239, SRR1691238, SRR1691237, SRR1691236, SRR1691235, SRR1691234, SRR1691233, SRR1691232, SRR1691231, SRR1691230, SRR1691229, SRR1691228, SRR1691227, SRR1691226, SRR1691225, SRR1691224, SRR1691223, SRR1691222, SRR1691221, SRR1691220, SRR1691219, SRR1691218, SRR1691217, SRR1691216, SRR1691215, SRR1691214, SRR1691213, SRR1691212, SRR1691211, SRR1691210, SRR1691209, SRR1691208, SRR1691207, SRR1691200, SRR1691199, SRR1691198, SRR1691197, SRR1691196, SRR1691195, SRR1691194, SRR1691192, SRR1691183, SRR1691181, SRR1691180, SRR1691179, SRR1691178, SRR1691177, SRR1691164, SRR1691163, SRR1691162,

SRR1691160, SRR1691158, SRR1691156, SRR1691154, SRR1691152, SRR1691151,
SRR1691149, SRR1691146, SRR1691145, SRR1691144, SRR1691143, SRR1691141,
SRR1691140, SRR1691138, SRR1691137, SRR1691136, SRR1691135, SRR1691103,
SRR1691099, SRR1691098, SRR1691096, SRR1691095, SRR1691094, SRR1691090,
SRR1691089, SRR1691088, SRR1691086, SRR1691084, SRR1691083, SRR1691082,
SRR1691081, SRR1691080, SRR1691079, SRR1691078, SRR1691076, SRR1691074,
SRR1691073, SRR1691072, SRR1691070, SRR1691069, SRR1691068, SRR1691067,
SRR1691065, SRR1691064, SRR1691056, SRR1691055, SRR1691052, SRR1691051,
SRR1691050, SRR1691048, SRR1691047, SRR1690952, SRR1688724, SRR1688723,
SRR1688722, SRR1688429, SRR1688427, SRR1688426, SRR1688425, SRR1688328,
SRR1688327, SRR1688326, SRR1688325, SRR1688031, SRR1688028, SRR1688025,
SRR1688024, SRR1688006, SRR1687981, SRR1687947, SRR1687913, SRR1687868,
SRR1687839, SRR1687608, SRR1687232, SRR1687231, SRR1687230, SRR1687229,
SRR1687227, SRR1687180, SRR1687091, SRR1687078, SRR1687077, SRR1687076,
SRR1687075, SRR1686979, SRR1686978, SRR1686977, SRR1686818, SRR1686436,
SRR1686404, SRR1686403, SRR1686402, SRR1686401, SRR1686400, SRR1686398,
SRR1685985, SRR1685982, SRR1685964, SRR1685963, SRR1685781, SRR1685780,
SRR1685779, SRR1685778, SRR1685777, SRR1685776, SRR1685775, SRR1685774,
SRR1685773, SRR1685772, SRR1685771, SRR1685770, SRR1685769, SRR1685768,
SRR1685767, SRR1685766, SRR1685765, SRR1685764, SRR1685763, SRR1685734,
SRR1685731, SRR1685717, SRR1685368, SRR1685367, SRR1685366, SRR1665108,
SRR1665107, SRR1665106, SRR1665105, SRR1665104, SRR1665103, SRR1665101,
SRR1665100, SRR1665099, SRR1665097, SRR1664818, SRR1664786, SRR1664785,
SRR1664784, SRR1664771, SRR1664720, SRR1664715, SRR1664714, SRR1664713,
SRR1664711, SRR1664710, SRR1664709, SRR1664708, SRR1664707, SRR1664706,
SRR1664703, SRR1664702, SRR1664701, SRR1664700, SRR1664691, SRR1664690,
SRR1664665, SRR1664659, SRR1664658, SRR1664657, SRR1664656, SRR1664038,
SRR1663706, SRR1663705, SRR1663704, SRR1663702, SRR1663701, SRR1663699,
SRR1663698, SRR1663696, SRR1663695, SRR1663694, SRR1663693, SRR1663692,
SRR1663691, SRR1663690, SRR1663688, SRR1663670, SRR1663470, SRR1663469,
SRR1663445, SRR1663444, SRR1663443, SRR1663442, SRR1663207, SRR1663194,
SRR1663193, SRR1663192, SRR1663188, SRR1663187, SRR1663185, SRR1663179,
SRR1663148, SRR1662220, SRR1662219, SRR1662218, SRR1662213, SRR1662145,
SRR1662144, SRR1662143, SRR1662142, SRR1662141, SRR1662140, SRR1662139,
SRR1662138, SRR1662137, SRR1662136, SRR1662135, SRR1662134, SRR1662133,
SRR1662132, SRR1662131, SRR1662130, SRR1661509, SRR1661508, SRR1661507,
SRR1661506, SRR1661505, SRR1661504, SRR1661484, SRR1661483, SRR1661478,
SRR1661477, SRR1661476, SRR1661475, SRR1661474, SRR1661473, SRR1661469,
SRR1661468, SRR1661467, SRR1661466, SRR1661465, SRR1661464, SRR1661463,
SRR1661420, SRR1661413, SRR1661412, SRR1661089, SRR1661087, SRR1661085,
SRR1661084, SRR1661083, SRR1660507, SRR1660506, SRR1660499, SRR1660456,
SRR1660454, SRR1660398, SRR1660397, SRR1660061, SRR1660060, SRR1660059,

SRR1660058, SRR1660050, SRR1660049, SRR1659922, SRR1659921, SRR1659081, SRR1659075, SRR1658901, SRR1658896, SRR1658873, SRR1658872, SRR1658871, SRR1658870, SRR1658430, SRR1658429, SRR1658428, SRR1658427, SRR1658426, SRR1658425, SRR1658023, SRR1657927, SRR1657478, SRR1657477, SRR1657476, SRR1657475, SRR1657474, SRR1657473, SRR1657472, SRR1657471, SRR1657470, SRR1657469, SRR1657468, SRR1657467, SRR1657466, SRR1657465, SRR1657464, SRR1657463, SRR1657462, SRR1657461, SRR1657460, SRR1657459, SRR1657458, SRR1657457, SRR1657456, SRR1657455, SRR1657454, SRR1657453, SRR1657452, SRR1657451, SRR1657450, SRR1657449, SRR1657448, SRR1657447, SRR1657446, SRR1657445, SRR1657444, SRR1657443, SRR1657442, SRR1657441, SRR1657440, SRR1656951, SRR1656865, SRR1656853, SRR1656781, SRR1656780, SRR1656779, SRR1656778, SRR1656777, SRR1656776, SRR1656775, SRR1656774, SRR1656773, SRR1656772, SRR1656771, SRR1656770, SRR1656769, SRR1656768, SRR1656767, SRR1656766, SRR1656765, SRR1656764, SRR1656763, SRR1656762, SRR1656761, SRR1656760, SRR1656759, SRR1656758, SRR1656757, SRR1656756, SRR1656755, SRR1656754, SRR1656753, SRR1656752, SRR1656751, SRR1656750, SRR1656749, SRR1656748, SRR1656747, SRR1656746, SRR1655121, SRR1655120, SRR1655119, SRR1655118, SRR1655117, SRR1655116, SRR1655115, SRR1655114, SRR1655113, SRR1655112, SRR1655111, SRR1655110, SRR1655109, SRR1655108, SRR1655107, SRR1655106, SRR1655105, SRR1655104, SRR1655102, SRR1655101, SRR1655100, SRR1655099, SRR1655098, SRR1655097, SRR1654927, SRR1654651, SRR1654650, SRR1654649, SRR1654491, SRR1654490, SRR1654368, SRR1654367, SRR1654366, SRR1654365, SRR1654364, SRR1654363, SRR1654362, SRR1654361, SRR1654360, SRR1654359, SRR1654358, SRR1654357, SRR1654356, SRR1654355, SRR1654354, SRR1654353, SRR1653718, SRR1653717, SRR1653716, SRR1653715, SRR1653714, SRR1653713, SRR1653712, SRR1653711, SRR1653710, SRR1653709, SRR1653708, SRR1653707, SRR1653706, SRR1653705, SRR1653704, SRR1653703, SRR1653645, SRR1653643, SRR1653637, SRR1653576, SRR1653574, SRR1653572, SRR1653338, SRR1653337, SRR1653336, SRR1653335, SRR1652486, SRR1652475, SRR1652474, SRR1652406, SRR1652403, SRR1652399, SRR1652397, SRR1652396, SRR1652395, SRR1652394, SRR1652393, SRR1652392, SRR1652340, SRR1652339, SRR1652338, SRR1652337, SRR1652336, SRR1652335, SRR1652333, SRR1652331, SRR1652328, SRR1652317, SRR1652316, SRR1652314, SRR1652313, SRR1652258, SRR1652257, SRR1652256, SRR1652255, SRR1652254, SRR1652253, SRR1652252, SRR1652251, SRR1652250, SRR1652249, SRR1652248, SRR1652247, SRR1652246, SRR1652245, SRR1652244, SRR1652243, SRR1652242, SRR1652241, SRR1652240, SRR1652239, SRR1652238, SRR1652237, SRR1652236, SRR1652235, SRR1652234, SRR1652233, SRR1652232, SRR1652231, SRR1652230, SRR1652229, SRR1652228, SRR1652227, SRR1652226, SRR1652225, SRR1652224, SRR1652223, SRR1652222, SRR1652221, SRR1652220, SRR1652219, SRR1652218, SRR1652217, SRR1652216, SRR1652215, SRR1652214, SRR1652213, SRR1652212, SRR1652211, SRR1652210, SRR1652209, SRR1652208, SRR1652207, SRR1652206, SRR1652205, SRR1652204, SRR1652203,

SRR1652202, SRR1652201, SRR1652200, SRR1652199, SRR1652198, SRR1652197, SRR1652196, SRR1652195, SRR1652194, SRR1652193, SRR1652192, SRR1652191, SRR1652190, SRR1652189, SRR1652188, SRR1652187, SRR1652186, SRR1652185, SRR1652184, SRR1652183, SRR1652182, SRR1652181, SRR1652180, SRR1652179, SRR1652178, SRR1652177, SRR1652176, SRR1652175, SRR1652174, SRR1652173, SRR1652172, SRR1652171, SRR1652170, SRR1652169, SRR1652168, SRR1652167, SRR1652166, SRR1652165, SRR1652164, SRR1652163, SRR1652162, SRR1652161, SRR1652160, SRR1652159, SRR1652158, SRR1652157, SRR1652156, SRR1652155, SRR1652154, SRR1652153, SRR1652152, SRR1652151, SRR1652150, SRR1652149, SRR1652148, SRR1652147, SRR1652146, SRR1652145, SRR1652144, SRR1652143, SRR1652142, SRR1652141, SRR1652140, SRR1652139, SRR1652138, SRR1652137, SRR1652136, SRR1652135, SRR1652134, SRR1652133, SRR1652132, SRR1652131, SRR1652130, SRR1652129, SRR1652128, SRR1652127, SRR1652126, SRR1652125, SRR1652124, SRR1652123, SRR1652122, SRR1652121, SRR1652120, SRR1652119, SRR1652118, SRR1652117, SRR1652116, SRR1652115, SRR1652114, SRR1652113, SRR1652112, SRR1652111, SRR1652110, SRR1652109, SRR1652108, SRR1652107, SRR1652106, SRR1652105, SRR1652104, SRR1652103, SRR1652102, SRR1652101, SRR1652100, SRR1652099, SRR1652098, SRR1652097, SRR1652096, SRR1652095, SRR1650607, SRR1649574, SRR1649573, SRR1649572, SRR1649571, SRR1649567, SRR1649566, SRR1649565, SRR1649564, SRR1649425, SRR1649408, SRR1649331, SRR1649327, SRR1649325, SRR1649321, SRR1649319, SRR1649315, SRR1649308, SRR1649142, SRR1649141, SRR1649140, SRR1649139, SRR1649138, SRR1649137, SRR1649136, SRR1649135, SRR1649134, SRR1649133, SRR1649132, SRR1649131, SRR1649130, SRR1649129, SRR1649128, SRR1649127, SRR1649126, SRR1649125, SRR1648494, SRR1648409, SRR1648408, SRR1648407, SRR1648406, SRR1648382, SRR1648380, SRR1648377, SRR1648366, SRR1648364, SRR1648225, SRR1648224, SRR1648223, SRR1648222, SRR1648221, SRR1648220, SRR1648218, SRR1648217, SRR1648215, SRR1648214, SRR1648213, SRR1648212, SRR1648211, SRR1648210, SRR1648209, SRR1648205, SRR1648204, SRR1648203, SRR1648197, SRR1648196, SRR1648195, SRR1648135, SRR1648124, SRR1648119, SRR1648083, SRR1648054, SRR1648050, SRR1648047, SRR1647784, SRR1647783, SRR1647748, SRR1647747, SRR1647746, SRR1647745, SRR1647744, SRR1647735, SRR1647734, SRR1647733, SRR1647732, SRR1647731, SRR1647730, SRR1647729, SRR1647728, SRR1647727, SRR1647726, SRR1647725, SRR1647724, SRR1647723, SRR1647722, SRR1647720, SRR1647719, SRR1647714, SRR1647713, SRR1647678, SRR1647677, SRR1647674, SRR1647673, SRR1647633, SRR1647632, SRR1646956, SRR1646955, SRR1646953, SRR1646951, SRR1646925, SRR1646854, SRR1646853, SRR1646846, SRR1646809, SRR1646808, SRR1646807, SRR1646806, SRR1646513, SRR1646512, SRR1646511, SRR1646510, SRR1646509, SRR1646508, SRR1646507, SRR1646506, SRR1646505, SRR1642915, SRR1642914, SRR1642913, SRR1642911, SRR1642910, SRR1642909, SRR1642854, SRR1642852, SRR1640909, SRR1640458, SRR1640452, SRR1640371, SRR1640370, SRR1640367, SRR1640366, SRR1639686, SRR1639685, SRR1639684,

SRR1639682, SRR1639681, SRR1639680, SRR1639679, SRR1639678, SRR1639676,
SRR1639661, SRR1639660, SRR1639659, SRR1639601, SRR1639333, SRR1639332,
SRR1639283, SRR1639282, SRR1639126, SRR1638207, SRR1638206, SRR1636866,
SRR1636865, SRR1636864, SRR1636863, SRR1636862, SRR1636721, SRR1636720,
SRR1636719, SRR1636718, SRR1636717, SRR1636716, SRR1636715, SRR1636714,
SRR1636713, SRR1636712, SRR1636711, SRR1636710, SRR1636709, SRR1636708,
SRR1636707, SRR1636706, SRR1636705, SRR1636704, SRR1635916, SRR1635915,
SRR1635700, SRR1635430, SRR1635416, SRR1635409, SRR1635406, SRR1635404,
SRR1635403, SRR1635401, SRR1635084, SRR1635033, SRR1635032, SRR1634297,
SRR1634296, SRR1634295, SRR1634294, SRR1634293, SRR1634292, SRR1634291,
SRR1634290, SRR1634289, SRR1634288, SRR1634287, SRR1634286, SRR1634285,
SRR1634284, SRR1634283, SRR1634282, SRR1634281, SRR1634280, SRR1634279,
SRR1634278, SRR1634277, SRR1634276, SRR1634275, SRR1634274, SRR1634028,
SRR1634026, SRR1633980, SRR1633478, SRR1633477, SRR1633476, SRR1633475,
SRR1633474, SRR1633473, SRR1633472, SRR1633471, SRR1633470, SRR1633469,
SRR1633468, SRR1633467, SRR1633466, SRR1633465, SRR1633464, SRR1633463,
SRR1633462, SRR1633461, SRR1633460, SRR1633459, SRR1633458, SRR1633457,
SRR1633408, SRR1633397, SRR1633388, SRR1633193, SRR1633192, SRR1633191,
SRR1633190, SRR1633189, SRR1633188, SRR1633187, SRR1633186, SRR1633185,
SRR1633184, SRR1633183, SRR1633182, SRR1633125, SRR1633124, SRR1633122,
SRR1633121, SRR1633120, SRR1633119, SRR1633118, SRR1633117, SRR1633116,
SRR1633115, SRR1633114, SRR1633113, SRR1633112, SRR1633111, SRR1633110,
SRR1633109, SRR1633108, SRR1633107, SRR1633106, SRR1633105, SRR1633104,
SRR1633103, SRR1633102, SRR1633101, SRR1633100, SRR1633099, SRR1633098,
SRR1633097, SRR1633096, SRR1633095, SRR1633094, SRR1633093, SRR1633092,
SRR1633091, SRR1633090, SRR1633089, SRR1633088, SRR1633087, SRR1633086,
SRR1633085, SRR1633084, SRR1633083, SRR1633082, SRR1633081, SRR1633080,
SRR1633079, SRR1633078, SRR1633077, SRR1633076, SRR1633075, SRR1633074,
SRR1633073, SRR1633072, SRR1633071, SRR1633070, SRR1633069, SRR1633068,
SRR1633067, SRR1633066, SRR1633065, SRR1633064, SRR1633063, SRR1633062,
SRR1633061, SRR1633060, SRR1633059, SRR1633058, SRR1633057, SRR1633056,
SRR1633055, SRR1633054, SRR1633053, SRR1633052, SRR1633051, SRR1633050,
SRR1633049, SRR1633048, SRR1633047, SRR1633046, SRR1633044, SRR1633043,
SRR1633042, SRR1633038, SRR1633037, SRR1633036, SRR1632288, SRR1632287,
SRR1632286, SRR1632284, SRR1632283, SRR1632282, SRR1632281, SRR1632280,
SRR1632278, SRR1632277, SRR1632276, SRR1632275, SRR1632274, SRR1632273,
SRR1632272, SRR1632271, SRR1632270, SRR1632269, SRR1632267, SRR1632266,
SRR1632265, SRR1632257, SRR1632251, SRR1631878, SRR1631877, SRR1631876,
SRR1631875, SRR1631874, SRR1631873, SRR1631872, SRR1631871, SRR1631870,
SRR1631869, SRR1631868, SRR1631867, SRR1631866, SRR1631865, SRR1631864,
SRR1631863, SRR1631862, SRR1631861, SRR1631860, SRR1631859, SRR1631858,
SRR1631857, SRR1631856, SRR1631855, SRR1631854, SRR1631853, SRR1631852,

SRR1631851, SRR1631850, SRR1631849, SRR1631848, SRR1631847, SRR1631846,
SRR1631845, SRR1631844, SRR1631843, SRR1631842, SRR1631841, SRR1631840,
SRR1631839, SRR1631838, SRR1631837, SRR1631836, SRR1631835, SRR1631834,
SRR1631833, SRR1631832, SRR1631831, SRR1631830, SRR1631829, SRR1631828,
SRR1631827, SRR1631826, SRR1631825, SRR1631824, SRR1631823, SRR1631822,
SRR1631821, SRR1631820, SRR1631819, SRR1631128, SRR1631127, SRR1631120,
SRR1631118, SRR1630824, SRR1630810, SRR1630808, SRR1630807, SRR1626452,
SRR1626427, SRR1626426, SRR1626419, SRR1624682, SRR1622094, SRR1622093,
SRR1622092, SRR1622091, SRR1622090, SRR1622089, SRR1622088, SRR1622087,
SRR1622086, SRR1622085, SRR1622084, SRR1622083, SRR1622082, SRR1622081,
SRR1622080, SRR1622079, SRR1621019, SRR1621018, SRR1621017, SRR1621016,
SRR1621015, SRR1621014, SRR1621013, SRR1620992, SRR1620991, SRR1620990,
SRR1620989, SRR1620988, SRR1620987, SRR1620977, SRR1620976, SRR1620975,
SRR1620974, SRR1620973, SRR1620972, SRR1620971, SRR1620969, SRR1620968,
SRR1620967, SRR1620966, SRR1620965, SRR1620963, SRR1620962, SRR1620961,
SRR1620960, SRR1620959, SRR1620957, SRR1620956, SRR1620955, SRR1620954,
SRR1620953, SRR1620952, SRR1620950, SRR1620949, SRR1620948, SRR1620947,
SRR1620946, SRR1620945, SRR1620944, SRR1620943, SRR1620942, SRR1620941,
SRR1620940, SRR1620939, SRR1620938, SRR1620937, SRR1620936, SRR1620935,
SRR1620934, SRR1620933, SRR1620932, SRR1620931, SRR1620930, SRR1620929,
SRR1620928, SRR1620927, SRR1620926, SRR1620925, SRR1620924, SRR1620923,
SRR1620922, SRR1620921, SRR1620920, SRR1620919, SRR1620918, SRR1620917,
SRR1620916, SRR1620915, SRR1620914, SRR1620913, SRR1620912, SRR1620911,
SRR1620910, SRR1620909, SRR1620908, SRR1620907, SRR1620906, SRR1620904,
SRR1620903, SRR1620901, SRR1620900, SRR1620898, SRR1620849, SRR1620847,
SRR1620846, SRR1620844, SRR1620843, SRR1620841, SRR1620839, SRR1620838,
SRR1620837, SRR1620836, SRR1620835, SRR1620834, SRR1620833, SRR1620832,
SRR1620830, SRR1620829, SRR1620828, SRR1620826, SRR1619674, SRR1619671,
SRR1619670, SRR1619669, SRR1619668, SRR1619667, SRR1619666, SRR1619665,
SRR1619664, SRR1619663, SRR1619662, SRR1619661, SRR1619660, SRR1619659,
SRR1619638, SRR1619637, SRR1619636, SRR1619635, SRR1619634, SRR1619633,
SRR1619608, SRR1619587, SRR1618883, SRR1618882, SRR1618847, SRR1618846,
SRR1618845, SRR1618844, SRR1618843, SRR1618842, SRR1618841, SRR1618840,
SRR1618839, SRR1618838, SRR1618583, SRR1618580, SRR1618579, SRR1618578,
SRR1618560, SRR1618559, SRR1618558, SRR1618556, SRR1618551, SRR1618549,
SRR1618548, SRR1618546, SRR1617560, SRR1617559, SRR1617558, SRR1617557,
SRR1617556, SRR1617555, SRR1617554, SRR1617553, SRR1617552, SRR1617551,
SRR1617550, SRR1617549, SRR1617535, SRR1617534, SRR1617533, SRR1617532,
SRR1617217, SRR1617216, SRR1617215, SRR1617214, SRR1617213, SRR1617212,
SRR1617210, SRR1617209, SRR1617208, SRR1617207, SRR1617206, SRR1617205,
SRR1617204, SRR1617203, SRR1617202, SRR1617201, SRR1617200, SRR1617199,
SRR1617198, SRR1617197, SRR1617196, SRR1617195, SRR1617194, SRR1617193,

SRR1617192, SRR1617191, SRR1617190, SRR1617189, SRR1617188, SRR1617187, SRR1617186, SRR1617185, SRR1617184, SRR1617183, SRR1617182, SRR1617181, SRR1617180, SRR1617179, SRR1617178, SRR1617177, SRR1617176, SRR1617175, SRR1617174, SRR1617173, SRR1617172, SRR1617171, SRR1617170, SRR1617169, SRR1617168, SRR1617167, SRR1617166, SRR1617165, SRR1617164, SRR1617163, SRR1617162, SRR1617161, SRR1617160, SRR1617159, SRR1617158, SRR1617157, SRR1617156, SRR1617155, SRR1617154, SRR1617153, SRR1617152, SRR1617151, SRR1617150, SRR1617149, SRR1617148, SRR1617147, SRR1617146, SRR1617145, SRR1617144, SRR1617143, SRR1617142, SRR1617141, SRR1617140, SRR1617139, SRR1617138, SRR1617137, SRR1617136, SRR1617135, SRR1617134, SRR1617133, SRR1617132, SRR1617131, SRR1617130, SRR1617129, SRR1617128, SRR1617127, SRR1617126, SRR1617125, SRR1617124, SRR1617123, SRR1617122, SRR1617121, SRR1617120, SRR1617119, SRR1617118, SRR1617117, SRR1617116, SRR1617115, SRR1617114, SRR1617113, SRR1617112, SRR1617111, SRR1617110, SRR1617109, SRR1617108, SRR1617107, SRR1617106, SRR1616998, SRR1616994, SRR1616991, SRR1615281, SRR1615280, SRR1615279, SRR1615278, SRR1615277, SRR1615276, SRR1615275, SRR1615274, SRR1615272, SRR1615271, SRR1615270, SRR1615269, SRR1615268, SRR1615267, SRR1615266, SRR1615265, SRR1615264, SRR1615250, SRR1615249, SRR1614278, SRR1614263, SRR1614262, SRR1614261, SRR1614260, SRR1614259, SRR1614258, SRR1614257, SRR1614256, SRR1614255, SRR1614254, SRR1614253, SRR1614252, SRR1614251, SRR1614250, SRR1614249, SRR1614248, SRR1614247, SRR1614246, SRR1613978, SRR1613977, SRR1613976, SRR1613975, SRR1613974, SRR1613973, SRR1613930, SRR1613928, SRR1613926, SRR1613925, SRR1613924, SRR1613923, SRR1613922, SRR1613921, SRR1613920, SRR1613372, SRR1613370, SRR1613369, SRR1613367, SRR1613366, SRR1613365, SRR1613364, SRR1613363, SRR1613362, SRR1613361, SRR1613360, SRR1613359, SRR1613358, SRR1613355, SRR1613354, SRR1613316, SRR1612530, SRR1612529, SRR1612528, SRR1612527, SRR1612526, SRR1612525, SRR1612406, SRR1612405, SRR1612404, SRR1612403, SRR1612397, SRR1612394, SRR1611792, SRR1611791, SRR1611770, SRR1611769, SRR1611765, SRR1611763, SRR1611761, SRR1611679, SRR1611617, SRR1611570, SRR1610990, SRR1610821, SRR1610770, SRR1610769, SRR1610768, SRR1610767, SRR1610508, SRR1610507, SRR1610506, SRR1610505, SRR1610504, SRR1610503, SRR1610502, SRR1610501, SRR1610500, SRR1610499, SRR1610498, SRR1610497, SRR1610496, SRR1610495, SRR1610494, SRR1610493, SRR1610492, SRR1610491, SRR1610490, SRR1610489, SRR1610488, SRR1610487, SRR1610486, SRR1610485, SRR1610484, SRR1610483, SRR1610482, SRR1610481, SRR1610480, SRR1610479, SRR1610478, SRR1610477, SRR1610476, SRR1610475, SRR1610474, SRR1610473, SRR1610472, SRR1610471, SRR1610470, SRR1610469, SRR1610467, SRR1610466, SRR1610465, SRR1610464, SRR1610463, SRR1610462, SRR1610461, SRR1610460, SRR1610459, SRR1610458, SRR1610457, SRR1610456, SRR1610455, SRR1610454, SRR1610453, SRR1610452, SRR1610451, SRR1610450, SRR1610449, SRR1610448, SRR1610424, SRR1610423, SRR1610422, SRR1610421, SRR1610329,

SRR1610328, SRR1610327, SRR1610326, SRR1610325, SRR1610324, SRR1610323, SRR1610322, SRR1610321, SRR1610320, SRR1610319, SRR1610318, SRR1610317, SRR1610316, SRR1610315, SRR1610314, SRR1610313, SRR1610312, SRR1610311, SRR1610310, SRR1610309, SRR1610308, SRR1610307, SRR1610306, SRR1610305, SRR1610304, SRR1610303, SRR1610302, SRR1610301, SRR1610300, SRR1610299, SRR1610298, SRR1610297, SRR1610296, SRR1610295, SRR1610294, SRR1609961, SRR1609960, SRR1609937, SRR1609936, SRR1609935, SRR1609934, SRR1609831, SRR1609830, SRR1609829, SRR1609828, SRR1609827, SRR1609826, SRR1609825, SRR1609824, SRR1609823, SRR1609822, SRR1609821, SRR1609820, SRR1609819, SRR1609818, SRR1609817, SRR1609816, SRR1609815, SRR1609814, SRR1609813, SRR1609812, SRR1609811, SRR1609810, SRR1609734, SRR1609733, SRR1609732, SRR1609731, SRR1609325, SRR1609324, SRR1609323, SRR1609322, SRR1609321, SRR1609320, SRR1609319, SRR1609318, SRR1609317, SRR1609316, SRR1609315, SRR1609314, SRR1609313, SRR1609312, SRR1609293, SRR1609153, SRR1609152, SRR1609135, SRR1609129, SRR1609127, SRR1609125, SRR1609124, SRR1609122, SRR1609065, SRR1609064, SRR1609063, SRR1608977, SRR1608973, SRR1606325, SRR1606323, SRR1606321, SRR1606320, SRR1606319, SRR1606318, SRR1606303, SRR1605127, SRR1605001, SRR1605000, SRR1604999, SRR1604998, SRR1604997, SRR1604996, SRR1604994, SRR1604993, SRR1604986, SRR1604984, SRR1604982, SRR1604981, SRR1604978, SRR1604977, SRR1604976, SRR1604974, SRR1604973, SRR1604972, SRR1604968, SRR1604963, SRR1604961, SRR1604960, SRR1604959, SRR1604958, SRR1604956, SRR1604954, SRR1604953, SRR1604952, SRR1604951, SRR1604948, SRR1604947, SRR1604946, SRR1604944, SRR1604943, SRR1604942, SRR1604941, SRR1604939, SRR1604938, SRR1604936, SRR1604882, SRR1603771, SRR1603770, SRR1603769, SRR1603768, SRR1603767, SRR1603766, SRR1603765, SRR1603764, SRR1603763, SRR1603762, SRR1603761, SRR1603760, SRR1603759, SRR1603758, SRR1603757, SRR1603756, SRR1603755, SRR1603754, SRR1603753, SRR1603752, SRR1603751, SRR1603750, SRR1603749, SRR1603748, SRR1603747, SRR1603746, SRR1603745, SRR1603744, SRR1603743, SRR1603742, SRR1603741, SRR1603740, SRR1603739, SRR1603738, SRR1603737, SRR1603736, SRR1603735, SRR1603734, SRR1603733, SRR1603732, SRR1603731, SRR1603730, SRR1603729, SRR1603728, SRR1603727, SRR1603726, SRR1603725, SRR1603724, SRR1603723, SRR1603722, SRR1603721, SRR1603720, SRR1603719, SRR1603718, SRR1603717, SRR1603716, SRR1603715, SRR1603714, SRR1603713, SRR1603712, SRR1603711, SRR1603710, SRR1603709, SRR1603708, SRR1603707, SRR1603706, SRR1603705, SRR1603704, SRR1603703, SRR1603702, SRR1603701, SRR1603700, SRR1603699, SRR1603698, SRR1603697, SRR1603696, SRR1603695, SRR1603694, SRR1603693, SRR1603692, SRR1603691, SRR1603690, SRR1603689, SRR1603688, SRR1603687, SRR1603686, SRR1603685, SRR1603684, SRR1603683, SRR1603682, SRR1603681, SRR1603680, SRR1603679, SRR1603678, SRR1603677, SRR1603676, SRR1603675, SRR1603674, SRR1603673, SRR1598992, SRR1598991, SRR1598990, SRR1598989, SRR1598985, SRR1598984, SRR1598974, SRR1598916, SRR1598915, SRR1598914,

SRR1598913, SRR1598912, SRR1598911, SRR1598910, SRR1598909, SRR1598868,
SRR1598867, SRR1598865, SRR1598864, SRR1598863, SRR1598862, SRR1598861,
SRR1598767, SRR1598766, SRR1598765, SRR1596351, SRR1596350, SRR1596349,
SRR1596348, SRR1596347, SRR1596346, SRR1596345, SRR1596344, SRR1596343,
SRR1596315, SRR1596314, SRR1596313, SRR1596312, SRR1596311, SRR1596310,
SRR1596309, SRR1596308, SRR1596307, SRR1596305, SRR1596300, SRR1596299,
SRR1595601, SRR1595569, SRR1595557, SRR1594679, SRR1594644, SRR1594352,
SRR1594351, SRR1594257, SRR1594255, SRR1594158, SRR1594156, SRR1594032,
SRR1594031, SRR1594030, SRR1594029, SRR1594028, SRR1594027, SRR1593621,
SRR1593620, SRR1593619, SRR1593618, SRR1593617, SRR1593521, SRR1592660,
SRR1592604, SRR1592603, SRR1592602, SRR1592601, SRR1592600, SRR1592599,
SRR1592598, SRR1592597, SRR1592596, SRR1592478, SRR1592477, SRR1592476,
SRR1592475, SRR1592309, SRR1592308, SRR1592307, SRR1592306, SRR1592305,
SRR1592304, SRR1592303, SRR1592302, SRR1592301, SRR1592300, SRR1592299,
SRR1592298, SRR1592297, SRR1592296, SRR1592295, SRR1592294, SRR1592293,
SRR1592292, SRR1592291, SRR1592290, SRR1592289, SRR1592288, SRR1592287,
SRR1592286, SRR1592154, SRR1592153, SRR1592152, SRR1592151, SRR1592150,
SRR1592149, SRR1592148, SRR1592147, SRR1592146, SRR1592144, SRR1592143,
SRR1592142, SRR1592141, SRR1592140, SRR1592139, SRR1592138, SRR1592137,
SRR1592136, SRR1592135, SRR1592134, SRR1589687, SRR1589686, SRR1589685,
SRR1589684, SRR1589683, SRR1589682, SRR1589681, SRR1589680, SRR1589679,
SRR1589678, SRR1589677, SRR1589676, SRR1589675, SRR1589674, SRR1589673,
SRR1589672, SRR1589671, SRR1589670, SRR1589669, SRR1589668, SRR1589667,
SRR1589666, SRR1589665, SRR1589664, SRR1589663, SRR1589662, SRR1589661,
SRR1589660, SRR1589659, SRR1589658, SRR1589657, SRR1589656, SRR1589655,
SRR1589654, SRR1589653, SRR1589652, SRR1589651, SRR1589650, SRR1589649,
SRR1589648, SRR1589647, SRR1589602, SRR1589601, SRR1589600, SRR1588661,
SRR1588660, SRR1588659, SRR1588658, SRR1588657, SRR1588656, SRR1588655,
SRR1588654, SRR1588653, SRR1588652, SRR1588651, SRR1588650, SRR1588649,
SRR1588648, SRR1588647, SRR1588646, SRR1588645, SRR1588644, SRR1588643,
SRR1588642, SRR1588641, SRR1588640, SRR1588639, SRR1588638, SRR1588637,
SRR1588636, SRR1588635, SRR1588634, SRR1588633, SRR1588632, SRR1588631,
SRR1588630, SRR1588600, SRR1588599, SRR1588598, SRR1588597, SRR1588596,
SRR1588595, SRR1588594, SRR1588593, SRR1588592, SRR1588591, SRR1588590,
SRR1588589, SRR1588588, SRR1588587, SRR1588586, SRR1588585, SRR1588584,
SRR1588583, SRR1588582, SRR1588581, SRR1588580, SRR1588579, SRR1588578,
SRR1588577, SRR1588576, SRR1588575, SRR1588574, SRR1588573, SRR1588572,
SRR1588571, SRR1588569, SRR1588549, SRR1588548, SRR1588547, SRR1588546,
SRR1588545, SRR1588544, SRR1588543, SRR1588542, SRR1588541, SRR1588540,
SRR1588539, SRR1588538, SRR1588537, SRR1588536, SRR1588535, SRR1588534,
SRR1588533, SRR1588532, SRR1588531, SRR1588530, SRR1588529, SRR1588528,
SRR1588527, SRR1588526, SRR1588525, SRR1588524, SRR1588523, SRR1588522,

SRR1586746, SRR1586745, SRR1586744, SRR1586743, SRR1586742, SRR1586741,
SRR1586740, SRR1586739, SRR1586738, SRR1586737, SRR1586736, SRR1586735,
SRR1586734, SRR1586733, SRR1586732, SRR1586731, SRR1586730, SRR1586729,
SRR1586728, SRR1586727, SRR1586726, SRR1586725, SRR1586724, SRR1586723,
SRR1586722, SRR1586721, SRR1586720, SRR1586719, SRR1586718, SRR1586717,
SRR1586716, SRR1586715, SRR1586714, SRR1586713, SRR1586712, SRR1586711,
SRR1586710, SRR1586709, SRR1586708, SRR1586707, SRR1586706, SRR1586705,
SRR1586704, SRR1586703, SRR1586702, SRR1586701, SRR1586700, SRR1586699,
SRR1586698, SRR1586697, SRR1586696, SRR1586695, SRR1586694, SRR1586693,
SRR1586692, SRR1586691, SRR1586690, SRR1586689, SRR1586688, SRR1586687,
SRR1586686, SRR1586685, SRR1586684, SRR1586683, SRR1586682, SRR1586681,
SRR1586680, SRR1586679, SRR1586678, SRR1586677, SRR1586676, SRR1586675,
SRR1586674, SRR1586673, SRR1586672, SRR1586671, SRR1586670, SRR1586669,
SRR1586668, SRR1586667, SRR1586666, SRR1586665, SRR1586664, SRR1586663,
SRR1586662, SRR1586661, SRR1586660, SRR1586659, SRR1586658, SRR1586657,
SRR1586656, SRR1586655, SRR1586654, SRR1586653, SRR1586652, SRR1586651,
SRR1586650, SRR1586649, SRR1586648, SRR1586647, SRR1586646, SRR1586645,
SRR1586644, SRR1586643, SRR1586642, SRR1586641, SRR1586640, SRR1586639,
SRR1586638, SRR1586637, SRR1586636, SRR1586635, SRR1586634, SRR1586633,
SRR1586632, SRR1586631, SRR1586630, SRR1586629, SRR1586628, SRR1586627,
SRR1586626, SRR1586625, SRR1586624, SRR1586623, SRR1586622, SRR1586621,
SRR1586620, SRR1586619, SRR1586618, SRR1586504, SRR1586500, SRR1586494,
SRR1586493, SRR1586492, SRR1586435, SRR1586433, SRR1586432, SRR1586431,
SRR1586429, SRR1586428, SRR1586427, SRR1586426, SRR1586425, SRR1586424,
SRR1586423, SRR1586422, SRR1586421, SRR1586420, SRR1586419, SRR1586402,
SRR1586401, SRR1586400, SRR1586399, SRR1586398, SRR1586397, SRR1586396,
SRR1586395, SRR1586394, SRR1586393, SRR1586392, SRR1586243, SRR1586242,
SRR1586241, SRR1586240, SRR1586239, SRR1586238, SRR1586237, SRR1586236,
SRR1586235, SRR1586234, SRR1586233, SRR1586232, SRR1586231, SRR1586230,
SRR1586229, SRR1586196, SRR1586157, SRR1586156, SRR1585955, SRR1585954,
SRR1585830, SRR1585635, SRR1585615, SRR1585373, SRR1585372, SRR1585313,
SRR1585312, SRR1585311, SRR1585310, SRR1585309, SRR1585308, SRR1585307,
SRR1585306, SRR1585305, SRR1585304, SRR1585303, SRR1585197, SRR1585196,
SRR1585195, SRR1584469, SRR1584468, SRR1584463, SRR1584462, SRR1584461,
SRR1584460, SRR1584459, SRR1584416, SRR1584415, SRR1584414, SRR1584409,
SRR1584408, SRR1584407, SRR1584405, SRR1584270, SRR1584269, SRR1584268,
SRR1584267, SRR1584266, SRR1584265, SRR1584264, SRR1584263, SRR1583944,
SRR1583943, SRR1583942, SRR1583941, SRR1583938, SRR1583937, SRR1583909,
SRR1583631, SRR1583630, SRR1583579, SRR1583556, SRR1582620, SRR1582502,
SRR1582492, SRR1582462, SRR1582461, SRR1582390, SRR1582389, SRR1582388,
SRR1582387, SRR1582385, SRR1582384, SRR1582383, SRR1582209, SRR1582201,
SRR1582200, SRR1582148, SRR1582140, SRR1582134, SRR1582133, SRR1582091,

SRR1582090, SRR1582089, SRR1582088, SRR1582087, SRR1582086, SRR1582057, SRR1582055, SRR1582052, SRR1582050, SRR1582046, SRR1582045, SRR1582041, SRR1582038, SRR1582037, SRR1582036, SRR1581609, SRR1581606, SRR1581604, SRR1581603, SRR1581245, SRR1581244, SRR1581243, SRR1581242, SRR1581231, SRR1581230, SRR1581209, SRR1581208, SRR1581145, SRR1581144, SRR1581120, SRR1581017, SRR1581016, SRR1581015, SRR1580819, SRR1580577, SRR1580576, SRR1580575, SRR1580574, SRR1580573, SRR1580572, SRR1580571, SRR1580570, SRR1580569, SRR1580568, SRR1580567, SRR1580566, SRR1580565, SRR1580564, SRR1580563, SRR1580562, SRR1580561, SRR1580560, SRR1580559, SRR1580558, SRR1580557, SRR1580556, SRR1580555, SRR1580554, SRR1578877, SRR1578876, SRR1578875, SRR1578874, SRR1578873, SRR1578872, SRR1578871, SRR1578870, SRR1578869, SRR1578868, SRR1578867, SRR1578866, SRR1578865, SRR1578864, SRR1578863, SRR1578862, SRR1578861, SRR1578860, SRR1578859, SRR1578858, SRR1578857, SRR1578856, SRR1578855, SRR1578854, SRR1578146, SRR1578145, SRR1578144, SRR1578143, SRR1578142, SRR1578141, SRR1578091, SRR1578089, SRR1578088, SRR1578087, SRR1578085, SRR1578084, SRR1578080, SRR1578073, SRR1578067, SRR1578066, SRR1577847, SRR1577845, SRR1577653, SRR1577652, SRR1577651, SRR1577650, SRR1577649, SRR1577648, SRR1577647, SRR1577646, SRR1577645, SRR1577644, SRR1577643, SRR1577642, SRR1577641, SRR1577640, SRR1577639, SRR1577638, SRR1577637, SRR1577636, SRR1577635, SRR1577634, SRR1577633, SRR1577632, SRR1577631, SRR1577101, SRR1576988, SRR1576783, SRR1576548, SRR1576251, SRR1576069, SRR1575317, SRR1575314, SRR1575225, SRR1575220, SRR1575216, SRR1575215, SRR1575214, SRR1575213, SRR1575212, SRR1575207, SRR1575204, SRR1575203, SRR1575202, SRR1575201, SRR1575200, SRR1575199, SRR1575198, SRR1575197, SRR1575196, SRR1575195, SRR1575194, SRR1575193, SRR1575192, SRR1575191, SRR1575190, SRR1575189, SRR1575188, SRR1575187, SRR1575186, SRR1575185, SRR1575184, SRR1575183, SRR1575182, SRR1575181, SRR1575180, SRR1575179, SRR1575169, SRR1575168, SRR1575156, SRR1574962, SRR1574961, SRR1574817, SRR1574816, SRR1574815, SRR1574781, SRR1574780, SRR1574778, SRR1574772, SRR1574719, SRR1574694, SRR1574692, SRR1574691, SRR1574690, SRR1574689, SRR1574328, SRR1574028, SRR1573898, SRR1573897, SRR1573896, SRR1573895, SRR1573894, SRR1573893, SRR1573892, SRR1573891, SRR1573890, SRR1573889, SRR1573888, SRR1573887, SRR1573527, SRR1573526, SRR1573525, SRR1573524, SRR1573523, SRR1573522, SRR1573521, SRR1573520, SRR1573519, SRR1573518, SRR1573517, SRR1573516, SRR1573515, SRR1573514, SRR1573513, SRR1573512, SRR1573511, SRR1573510, SRR1573509, SRR1573508, SRR1573507, SRR1573506, SRR1573505, SRR1573504, SRR1573503, SRR1573331, SRR1573330, SRR1573048, SRR1573047, SRR1573046, SRR1573045, SRR1573044, SRR1573043, SRR1573042, SRR1573041, SRR1573040, SRR1573039, SRR1573038, SRR1573037, SRR1573036, SRR1573035, SRR1573034, SRR1573033, SRR1573032, SRR1573031, SRR1573030, SRR1573029, SRR1572991, SRR1572990, SRR1572989, SRR1572988, SRR1572987, SRR1572986, SRR1572985, SRR1572984,

SRR1572983, SRR1572982, SRR1572981, SRR1572733, SRR1572732, SRR1572731, SRR1572730, SRR1572177, SRR1572176, SRR1572168, SRR1570738, SRR1570737, SRR1570704, SRR1570032, SRR1569904, SRR1569903, SRR1569490, SRR1569488, SRR1569486, SRR1569479, SRR1569478, SRR1569477, SRR1569476, SRR1569475, SRR1569474, SRR1569473, SRR1569472, SRR1569471, SRR1569469, SRR1569468, SRR1569467, SRR1569465, SRR1569464, SRR1569463, SRR1569432, SRR1569430, SRR1569412, SRR1569385, SRR1569309, SRR1569274, SRR1569251, SRR1569250, SRR1569249, SRR1569248, SRR1568805, SRR1568789, SRR1568786, SRR1568275, SRR1568273, SRR1568248, SRR1567904, SRR1567903, SRR1567902, SRR1567901, SRR1567900, SRR1567899, SRR1567898, SRR1567897, SRR1567896, SRR1567895, SRR1567894, SRR1567893, SRR1567673, SRR1567672, SRR1567671, SRR1567670, SRR1565804, SRR1565803, SRR1565802, SRR1565801, SRR1565800, SRR1565799, SRR1565798, SRR1565797, SRR1565796, SRR1565795, SRR1565794, SRR1565793, SRR1565792, SRR1565791, SRR1565790, SRR1565789, SRR1565788, SRR1565787, SRR1565786, SRR1565785, SRR1565784, SRR1565783, SRR1565778, SRR1565777, SRR1565776, SRR1565775, SRR1565774, SRR1565773, SRR1565474, SRR1565381, SRR1564728, SRR1564727, SRR1564726, SRR1564724, SRR1564723, SRR1564722, SRR1564721, SRR1564720, SRR1564719, SRR1564718, SRR1564717, SRR1564716, SRR1564715, SRR1564714, SRR1564517, SRR1564468, SRR1564467, SRR1564466, SRR1564465, SRR1564464, SRR1564463, SRR1564462, SRR1564461, SRR1564460, SRR1564459, SRR1564458, SRR1564457, SRR1564456, SRR1564455, SRR1564454, SRR1564453, SRR1564452, SRR1564451, SRR1564450, SRR1564449, SRR1564448, SRR1564447, SRR1564446, SRR1564445, SRR1564420, SRR1564418, SRR1564300, SRR1564299, SRR1564294, SRR1564293, SRR1564292, SRR1564290, SRR1564288, SRR1564287, SRR1564286, SRR1564285, SRR1564283, SRR1564282, SRR1564280, SRR1564274, SRR1564270, SRR1564269, SRR1564164, SRR1564163, SRR1564162, SRR1564161, SRR1564160, SRR1564159, SRR1564158, SRR1564157, SRR1564156, SRR1564155, SRR1564154, SRR1564153, SRR1564152, SRR1564151, SRR1564150, SRR1564149, SRR1564148, SRR1564147, SRR1564146, SRR1564145, SRR1563147, SRR1563146, SRR1563144, SRR1563143, SRR1563142, SRR1563141, SRR1563138, SRR1563137, SRR1563136, SRR1563135, SRR1563134, SRR1563133, SRR1563132, SRR1563131, SRR1563130, SRR1562996, SRR1562957, SRR1562956, SRR1562955, SRR1562954, SRR1562953, SRR1562952, SRR1562951, SRR1562950, SRR1562949, SRR1562948, SRR1562947, SRR1562946, SRR1562945, SRR1562944, SRR1562943, SRR1562942, SRR1562941, SRR1562860, SRR1562834, SRR1562278, SRR1562277, SRR1562276, SRR1562266, SRR1562265, SRR1562264, SRR1562258, SRR1562257, SRR1562256, SRR1562255, SRR1562254, SRR1562253, SRR1562252, SRR1562251, SRR1562250, SRR1562187, SRR1562177, SRR1562165, SRR1562088, SRR1562087, SRR1562076, SRR1562075, SRR1562074, SRR1562072, SRR1562071, SRR1562070, SRR1562069, SRR1562068, SRR1562067, SRR1562061, SRR1562026, SRR1562025, SRR1562024, SRR1562023, SRR1562022, SRR1562021, SRR1562020, SRR1562019, SRR1561613, SRR1561612, SRR1561611, SRR1561610, SRR1561609, SRR1561608,

SRR1561607, SRR1561606, SRR1561605, SRR1561576, SRR1561575, SRR1561574,
SRR1561573, SRR1561429, SRR1561426, SRR1561197, SRR1561176, SRR1561174,
SRR1561161, SRR1561153, SRR1560724, SRR1560723, SRR1560722, SRR1560465,
SRR1560262, SRR1560261, SRR1560260, SRR1560259, SRR1560258, SRR1560257,
SRR1560256, SRR1560255, SRR1560254, SRR1560253, SRR1560252, SRR1560251,
SRR1560145, SRR1560144, SRR1560143, SRR1560142, SRR1560141, SRR1560140,
SRR1560139, SRR1560138, SRR1560137, SRR1560136, SRR1560135, SRR1560134,
SRR1560129, SRR1560128, SRR1560127, SRR1560126, SRR1560125, SRR1560124,
SRR1560123, SRR1560122, SRR1560121, SRR1560120, SRR1560119, SRR1560118,
SRR1559299, SRR1559276, SRR1559275, SRR1558172, SRR1557864, SRR1557863,
SRR1557862, SRR1557861, SRR1557860, SRR1557704, SRR1557703, SRR1557702,
SRR1557211, SRR1557210, SRR1557209, SRR1557208, SRR1557207, SRR1557206,
SRR1557134, SRR1556766, SRR1556765, SRR1556764, SRR1556763, SRR1556451,
SRR1556037, SRR1556036, SRR1556034, SRR1556033, SRR1556032, SRR1556031,
SRR1556030, SRR1556029, SRR1556028, SRR1556027, SRR1556026, SRR1556025,
SRR1556023, SRR1556020, SRR1556018, SRR1556016, SRR1556014, SRR1556011,
SRR1555807, SRR1555806, SRR1555805, SRR1555804, SRR1555803, SRR1555802,
SRR1555801, SRR1555800, SRR1555799, SRR1555798, SRR1555797, SRR1555796,
SRR1555795, SRR1555794, SRR1555793, SRR1555792, SRR1555791, SRR1555790,
SRR1555789, SRR1555788, SRR1555787, SRR1555786, SRR1555785, SRR1555784,
SRR1555783, SRR1555782, SRR1555781, SRR1555780, SRR1555779, SRR1555778,
SRR1555777, SRR1555776, SRR1555775, SRR1555774, SRR1555773, SRR1555772,
SRR1555751, SRR1555749, SRR1555747, SRR1555746, SRR1555737, SRR1555736,
SRR1555697, SRR1555696, SRR1555695, SRR1555245, SRR1555244, SRR1555243,
SRR1555242, SRR1555241, SRR1555240, SRR1555239, SRR1555238, SRR1555237,
SRR1555236, SRR1555235, SRR1555234, SRR1555233, SRR1555232, SRR1554512,
SRR1554451, SRR1554449, SRR1554320, SRR1554181, SRR1554180, SRR1554179,
SRR1554086, SRR1554085, SRR1554080, SRR1553996, SRR1553993, SRR1553992,
SRR1553991, SRR1553990, SRR1553368, SRR1553367, SRR1553356, SRR1553343,
SRR1553341, SRR1553340, SRR1553338, SRR1553337, SRR1553336, SRR1553335,
SRR1553333, SRR1553332, SRR1553331, SRR1553330, SRR1553329, SRR1553328,
SRR1553326, SRR1553315, SRR1553314, SRR1553313, SRR1553311, SRR1553307,
SRR1553305, SRR1553300, SRR1553299, SRR1553298, SRR1553297, SRR1553296,
SRR1553295, SRR1553294, SRR1553276, SRR1553275, SRR1552617, SRR1552589,
SRR1552588, SRR1552587, SRR1552498, SRR1552497, SRR1552218, SRR1552217,
SRR1552215, SRR1552203, SRR1552101, SRR1552100, SRR1551952, SRR1549165,
SRR1548712, SRR1548705, SRR1548704, SRR1548703, SRR1548702, SRR1548701,
SRR1548700, SRR1548699, SRR1548698, SRR1548697, SRR1548696, SRR1548695,
SRR1548694, SRR1548693, SRR1548692, SRR1548691, SRR1548690, SRR1548689,
SRR1548688, SRR1548687, SRR1548686, SRR1548685, SRR1548684, SRR1548683,
SRR1548682, SRR1548543, SRR1548542, SRR1548541, SRR1548540, SRR1548500,
SRR1548499, SRR1548498, SRR1548497, SRR1548496, SRR1548495, SRR1548488,

SRR1548487, SRR1548485, SRR1548484, SRR1548480, SRR1548478, SRR1548473,
SRR1548471, SRR1544280, SRR1544279, SRR1544256, SRR1544255, SRR1544068,
SRR1542706, SRR1542705, SRR1542704, SRR1542703, SRR1542702, SRR1542701,
SRR1542700, SRR1542627, SRR1542626, SRR1542623, SRR1542596, SRR1542595,
SRR1542417, SRR1542416, SRR1542415, SRR1542414, SRR1542413, SRR1542412,
SRR1542411, SRR1542410, SRR1542409, SRR1542408, SRR1542407, SRR1542406,
SRR1542405, SRR1542404, SRR1542261, SRR1542260, SRR1542259, SRR1542258,
SRR1542257, SRR1542256, SRR1542255, SRR1542254, SRR1542253, SRR1542252,
SRR1542251, SRR1542250, SRR1542249, SRR1542248, SRR1542247, SRR1542246,
SRR1542245, SRR1542244, SRR1542243, SRR1542242, SRR1542241, SRR1542240,
SRR1542239, SRR1542235, SRR1542211, SRR1542210, SRR1542208, SRR1542207,
SRR1542206, SRR1542204, SRR1542203, SRR1542202, SRR1542198, SRR1542196,
SRR1539568, SRR1539567, SRR1539566, SRR1539565, SRR1539564, SRR1539563,
SRR1539562, SRR1539561, SRR1539560, SRR1539559, SRR1539558, SRR1539557,
SRR1539556, SRR1539206, SRR1538933, SRR1538932, SRR1538931, SRR1538930,
SRR1538929, SRR1538928, SRR1538905, SRR1538904, SRR1538903, SRR1538848,
SRR1538829, SRR1538828, SRR1538708, SRR1538707, SRR1538706, SRR1538705,
SRR1538704, SRR1538703, SRR1538491, SRR1538490, SRR1538489, SRR1538488,
SRR1538487, SRR1538486, SRR1538485, SRR1538484, SRR1538457, SRR1538456,
SRR1537558, SRR1537556, SRR1537555, SRR1537554, SRR1537553, SRR1537551,
SRR1537519, SRR1537289, SRR1537288, SRR1536805, SRR1536431, SRR1536430,
SRR1536314, SRR1536313, SRR1536312, SRR1536311, SRR1536310, SRR1536309,
SRR1536308, SRR1536307, SRR1536306, SRR1536245, SRR1536192, SRR1536191,
SRR1536179, SRR1536178, SRR1536177, SRR1536113, SRR1536111, SRR1536109,
SRR1536088, SRR1536087, SRR1535993, SRR1535664, SRR1535035, SRR1535034,
SRR1535029, SRR1535028, SRR1535027, SRR1535026, SRR1535018, SRR1535017,
SRR1535016, SRR1535015, SRR1534802, SRR1534799, SRR1534797, SRR1534795,
SRR1534396, SRR1534337, SRR1533845, SRR1533844, SRR1532995, SRR1532819,
SRR1532598, SRR1532588, SRR1531589, SRR1531588, SRR1531587, SRR1531429,
SRR1531428, SRR1531427, SRR1531426, SRR1531425, SRR1531424, SRR1531423,
SRR1531422, SRR1531421, SRR1531420, SRR1531419, SRR1531418, SRR1531162,
SRR1531151, SRR1531150, SRR1531035, SRR1528419, SRR1528418, SRR1528417,
SRR1528416, SRR1528415, SRR1528414, SRR1528413, SRR1528412, SRR1528411,
SRR1528410, SRR1528409, SRR1528408, SRR1528407, SRR1528406, SRR1528405,
SRR1528404, SRR1528403, SRR1528402, SRR1528401, SRR1528400, SRR1528399,
SRR1528398, SRR1528397, SRR1528396, SRR1528395, SRR1528394, SRR1528393,
SRR1528392, SRR1528391, SRR1528390, SRR1528389, SRR1528388, SRR1528387,
SRR1528386, SRR1528385, SRR1528384, SRR1528383, SRR1528382, SRR1528381,
SRR1528380, SRR1528379, SRR1528378, SRR1528377, SRR1528376, SRR1528375,
SRR1528374, SRR1528373, SRR1528372, SRR1528371, SRR1528370, SRR1528369,
SRR1528368, SRR1528367, SRR1528366, SRR1528365, SRR1528364, SRR1528363,
SRR1528362, SRR1528361, SRR1528360, SRR1528359, SRR1528358, SRR1528357,

SRR1528356, SRR1528355, SRR1528354, SRR1528353, SRR1528352, SRR1528351, SRR1528350, SRR1525793, SRR1525792, SRR1525791, SRR1525790, SRR1525779, SRR1525778, SRR1525777, SRR1525776, SRR1525775, SRR1525660, SRR1525659, SRR1525658, SRR1525657, SRR1525656, SRR1525437, SRR1525436, SRR1525416, SRR1525415, SRR1525287, SRR1525286, SRR1525285, SRR1525284, SRR1525237, SRR1525231, SRR1525226, SRR1525224, SRR1525214, SRR1525213, SRR1525114, SRR1525113, SRR1525087, SRR1525086, SRR1525052, SRR1525051, SRR1525050, SRR1525049, SRR1525048, SRR1525047, SRR1525046, SRR1525045, SRR1525018, SRR1525017, SRR1525016, SRR1525015, SRR1525014, SRR1525013, SRR1525012, SRR1525011, SRR1525010, SRR1525009, SRR1525008, SRR1525007, SRR1525005, SRR1525004, SRR1525003, SRR1525002, SRR1525001, SRR1524999, SRR1524952, SRR1524951, SRR1524950, SRR1524949, SRR1524948, SRR1524947, SRR1524946, SRR1524945, SRR1524941, SRR1524940, SRR1524938, SRR1524935, SRR1524932, SRR1524842, SRR1524841, SRR1524839, SRR1524838, SRR1523326, SRR1523325, SRR1523324, SRR1523323, SRR1523322, SRR1523321, SRR1523320, SRR1523319, SRR1523318, SRR1523317, SRR1523316, SRR1523315, SRR1523314, SRR1523313, SRR1523312, SRR1523311, SRR1523310, SRR1523309, SRR1523308, SRR1523307, SRR1523306, SRR1523305, SRR1523304, SRR1523303, SRR1523296, SRR1523295, SRR1523294, SRR1523293, SRR1523290, SRR1523289, SRR1523288, SRR1523109, SRR1523108, SRR1523107, SRR1523104, SRR1523078, SRR1523077, SRR1523075, SRR1523071, SRR1523070, SRR1522125, SRR1522119, SRR1522047, SRR1521954, SRR1521950, SRR1521949, SRR1521948, SRR1521947, SRR1521745, SRR1521744, SRR1521743, SRR1521742, SRR1521741, SRR1521740, SRR1521739, SRR1521738, SRR1521737, SRR1521736, SRR1521735, SRR1521734, SRR1521733, SRR1521732, SRR1521731, SRR1521730, SRR1521729, SRR1521728, SRR1521727, SRR1521726, SRR1521725, SRR1521724, SRR1521723, SRR1521722, SRR1521721, SRR1521720, SRR1521719, SRR1521718, SRR1521717, SRR1521716, SRR1521715, SRR1521714, SRR1521713, SRR1521712, SRR1521711, SRR1521710, SRR1521709, SRR1521708, SRR1521707, SRR1521706, SRR1521705, SRR1521704, SRR1521703, SRR1521702, SRR1521701, SRR1521700, SRR1521699, SRR1521698, SRR1521697, SRR1521696, SRR1521695, SRR1521694, SRR1521693, SRR1521692, SRR1521691, SRR1521690, SRR1521689, SRR1521688, SRR1521687, SRR1521686, SRR1521685, SRR1521684, SRR1521683, SRR1521682, SRR1521681, SRR1521680, SRR1521477, SRR1521476, SRR1521475, SRR1521474, SRR1521473, SRR1521472, SRR1521471, SRR1521470, SRR1521469, SRR1521468, SRR1521467, SRR1521466, SRR1519878, SRR1519877, SRR1519876, SRR1519875, SRR1519874, SRR1519873, SRR1519872, SRR1519871, SRR1519870, SRR1519869, SRR1519868, SRR1519867, SRR1519329, SRR1519326, SRR1519324, SRR1519081, SRR1518937, SRR1518632, SRR1518463, SRR1518461, SRR1518460, SRR1518382, SRR1518381, SRR1518291, SRR1517819, SRR1515997, SRR1515996, SRR1515995, SRR1515994, SRR1515993, SRR1515992, SRR1515991, SRR1515990, SRR1515989, SRR1515988, SRR1515987, SRR1515986, SRR1515983, SRR1515982, SRR1515981, SRR1515980, SRR1515979, SRR1515978, SRR1515977,

SRR1515976, SRR1515975, SRR1515974, SRR1515973, SRR1515972, SRR1515165,
SRR1514982, SRR1514962, SRR1514949, SRR1514913, SRR1514810, SRR1514808,
SRR1514242, SRR1514099, SRR1514098, SRR1513326, SRR1513325, SRR1511015,
SRR1509982, SRR1509867, SRR1509865, SRR1509864, SRR1509863, SRR1509831,
SRR1509830, SRR1509825, SRR1509824, SRR1509823, SRR1509821, SRR1509818,
SRR1509815, SRR1509675, SRR1509674, SRR1509673, SRR1509663, SRR1509662,
SRR1509661, SRR1509660, SRR1509642, SRR1509641, SRR1509588, SRR1509526,
SRR1509462, SRR1509389, SRR1509374, SRR1509373, SRR1509372, SRR1509370,
SRR1509356, SRR1509355, SRR1508782, SRR1508758, SRR1508756, SRR1508755,
SRR1508753, SRR1508751, SRR1508468, SRR1508467, SRR1508466, SRR1508465,
SRR1508464, SRR1508463, SRR1508462, SRR1508461, SRR1508460, SRR1508459,
SRR1508458, SRR1508384, SRR1508383, SRR1508382, SRR1508381, SRR1508380,
SRR1508379, SRR1508378, SRR1508377, SRR1508376, SRR1508375, SRR1508374,
SRR1508373, SRR1508372, SRR1508371, SRR1508370, SRR1508369, SRR1508247,
SRR1508246, SRR1508245, SRR1508244, SRR1508243, SRR1508242, SRR1508241,
SRR1508240, SRR1508239, SRR1508238, SRR1508229, SRR1508228, SRR1508213,
SRR1508212, SRR1508197, SRR1508196, SRR1508195, SRR1508193, SRR1508192,
SRR1508167, SRR1508166, SRR1508165, SRR1508164, SRR1507206, SRR1507205,
SRR1507204, SRR1507203, SRR1507202, SRR1507201, SRR1507200, SRR1507199,
SRR1507198, SRR1507197, SRR1507182, SRR1507181, SRR1507180, SRR1507065,
SRR1506104, SRR1506103, SRR1506102, SRR1506101, SRR1506100, SRR1506099,
SRR1506098, SRR1506097, SRR1506096, SRR1506095, SRR1506094, SRR1506093,
SRR1506092, SRR1506091, SRR1506090, SRR1506089, SRR1506086, SRR1506063,
SRR1505884, SRR1505796, SRR1505795, SRR1505794, SRR1503855, SRR1503854,
SRR1503853, SRR1503852, SRR1503851, SRR1503850, SRR1503849, SRR1503848,
SRR1503598, SRR1503597, SRR1503595, SRR1503555, SRR1503514, SRR1503502,
SRR1503344, SRR1503343, SRR1503342, SRR1503338, SRR1502882, SRR1502881,
SRR1502880, SRR1502879, SRR1502878, SRR1502877, SRR1502876, SRR1502875,
SRR1502874, SRR1502873, SRR1502872, SRR1502871, SRR1502852, SRR1501219,
SRR1501088, SRR1501066, SRR1485289, SRR1485288, SRR1485287, SRR1485286,
SRR1485285, SRR1485284, SRR1485283, SRR1485282, SRR1485281, SRR1485280,
SRR1485279, SRR1485278, SRR1485277, SRR1485276, SRR1485275, SRR1485274,
SRR1485273, SRR1485272, SRR1485271, SRR1485270, SRR1485269, SRR1485268,
SRR1485267, SRR1485266, SRR1485265, SRR1485264, SRR1485263, SRR1485262,
SRR1485261, SRR1485260, SRR1485259, SRR1485258, SRR1485224, SRR1485223,
SRR1485222, SRR1485221, SRR1485220, SRR1485219, SRR1485218, SRR1485217,
SRR1485216, SRR1485215, SRR1485214, SRR1485213, SRR1485212, SRR1485211,
SRR1485210, SRR1485209, SRR1485208, SRR1485207, SRR1485206, SRR1485205,
SRR1485204, SRR1485203, SRR1485202, SRR1485201, SRR1485200, SRR1485199,
SRR1485198, SRR1485197, SRR1482408, SRR1481491, SRR1481490, SRR1481488,
SRR1481487, SRR1481485, SRR1481484, SRR1477753, SRR1472854, SRR1472847,
SRR1472843, SRR1472842, SRR1472835, SRR1472834, SRR1463412, SRR1463411,

SRR1463410, SRR1463351, SRR1463350, SRR1463349, SRR1463348, SRR1463346,
SRR1463344, SRR1463340, SRR1463335, SRR1463334, SRR1463333, SRR1463332,
SRR1463331, SRR1463330, SRR1463329, SRR1463328, SRR1463327, SRR1463326,
SRR1463325, SRR1463207, SRR1462339, SRR1460554, SRR1460553, SRR1460552,
SRR1460551, SRR1460550, SRR1460549, SRR1460477, SRR1460120, SRR1460119,
SRR1458972, SRR1451681, SRR1451680, SRR1451679, SRR1451678, SRR1451677,
SRR1451676, SRR1451675, SRR1451674, SRR1451673, SRR1451672, SRR1451671,
SRR1451670, SRR1451669, SRR1451668, SRR1451667, SRR1451666, SRR1451665,
SRR1451664, SRR1451663, SRR1451662, SRR1451661, SRR1451660, SRR1451659,
SRR1451658, SRR1451657, SRR1451656, SRR1451655, SRR1451654, SRR1451653,
SRR1451652, SRR1451651, SRR1451650, SRR1451649, SRR1451648, SRR1451647,
SRR1451646, SRR1451645, SRR1451644, SRR1451643, SRR1451642, SRR1451641,
SRR1451640, SRR1451639, SRR1451638, SRR1451637, SRR1451636, SRR1451635,
SRR1451634, SRR1451633, SRR1451632, SRR1451631, SRR1451630, SRR1451629,
SRR1451628, SRR1451627, SRR1451626, SRR1451625, SRR1451624, SRR1451623,
SRR1451622, SRR1451621, SRR1451620, SRR1451619, SRR1451618, SRR1451617,
SRR1451616, SRR1451615, SRR1451614, SRR1451613, SRR1451612, SRR1451611,
SRR1451610, SRR1451609, SRR1451608, SRR1451607, SRR1451606, SRR1451605,
SRR1451604, SRR1451241, SRR1451240, SRR1451239, SRR1451238, SRR1451237,
SRR1451236, SRR1451235, SRR1451234, SRR1451233, SRR1451232, SRR1451231,
SRR1451230, SRR1451229, SRR1451228, SRR1451227, SRR1451226, SRR1451225,
SRR1451224, SRR1451223, SRR1451222, SRR1451221, SRR1451220, SRR1451219,
SRR1451218, SRR1451217, SRR1451216, SRR1451215, SRR1451214, SRR1451213,
SRR1451212, SRR1451211, SRR1451210, SRR1449867, SRR1449866, SRR1449240,
SRR1448319, SRR1448308, SRR1448307, SRR1448306, SRR1448305, SRR1448304,
SRR1448303, SRR1448261, SRR1438496, SRR1438257, SRR1438256, SRR1438230,
SRR1438229, SRR1438228, SRR1437687, SRR1427470, SRR1427206, SRR1427172,
SRR1427171, SRR1427170, SRR1427169, SRR1427168, SRR1427167, SRR1427166,
SRR1425929, SRR1425928, SRR1425927, SRR1425926, SRR1425915, SRR1425860,
SRR1425859, SRR1425858, SRR1425857, SRR1425856, SRR1425855, SRR1425854,
SRR1425853, SRR1425852, SRR1425851, SRR1425850, SRR1425849, SRR1425848,
SRR1425847, SRR1425846, SRR1425845, SRR1425844, SRR1425843, SRR1425842,
SRR1425841, SRR1425840, SRR1425839, SRR1425838, SRR1425837, SRR1425361,
SRR1425360, SRR1425359, SRR1425357, SRR1425301, SRR1424585, SRR1424584,
SRR1424583, SRR1424571, SRR1424568, SRR1421734, SRR1421513, SRR1413891,
SRR1413624, SRR1413099, SRR1412914, SRR1410113, SRR1410112, SRR1410111,
SRR1410110, SRR1410109, SRR1410108, SRR1410107, SRR1410106, SRR1408833,
SRR1408832, SRR1408831, SRR1408830, SRR1408829, SRR1408828, SRR1408827,
SRR1408826, SRR1408825, SRR1408824, SRR1408823, SRR1408822, SRR1408821,
SRR1408820, SRR1408819, SRR1408818, SRR1408817, SRR1408816, SRR1408815,
SRR1408814, SRR1408813, SRR1408812, SRR1408787, SRR1408751, SRR1408734,
SRR1408676, SRR1408656, SRR1408655, SRR1408653, SRR1408613, SRR1408447,

SRR1408326, SRR1408166, SRR1407912, SRR1407910, SRR1407784, SRR1405701, SRR1405687, SRR1405685, SRR1405683, SRR1405682, SRR1405681, SRR1400578, SRR1400577, SRR1400576, SRR1400575, SRR1390625, SRR1388784, SRR1380981, SRR1380980, SRR1380029, SRR1380028, SRR1380027, SRR1380026, SRR1380025, SRR1380024, SRR1380023, SRR1380022, SRR1380021, SRR1379928, SRR1379927, SRR1379926, SRR1379925, SRR1379924, SRR1379923, SRR1379922, SRR1379921, SRR1379920, SRR1379919, SRR1379918, SRR1379917, SRR1379916, SRR1379915, SRR1379914, SRR1379913, SRR1379912, SRR1379911, SRR1377239, SRR1377081, SRR1377080, SRR1377079, SRR1377078, SRR1377077, SRR1377076, SRR1377075, SRR1377074, SRR1377073, SRR1377072, SRR1377071, SRR1377070, SRR1377069, SRR1377068, SRR1377067, SRR1377066, SRR1377065, SRR1377064, SRR1377063, SRR1377062, SRR1377061, SRR1377060, SRR1377059, SRR1377058, SRR1377057, SRR1377056, SRR1377055, SRR1373439, SRR1371393, SRR1371391, SRR1371390, SRR1371285, SRR1371284, SRR1371283, SRR1371282, SRR1371281, SRR1371280, SRR1371279, SRR1371278, SRR1371277, SRR1371276, SRR1371275, SRR1371274, SRR1371273, SRR1371272, SRR1371271, SRR1371270, SRR1371269, SRR1371268, SRR1371267, SRR1371266, SRR1371265, SRR1371264, SRR1371263, SRR1371262, SRR1371261, SRR1371260, SRR1371259, SRR1371258, SRR1371257, SRR1371256, SRR1371255, SRR1371254, SRR1371253, SRR1371252, SRR1371251, SRR1371250, SRR1371249, SRR1371248, SRR1371247, SRR1371246, SRR1371245, SRR1371244, SRR1371243, SRR1371242, SRR1371241, SRR1371240, SRR1371239, SRR1371238, SRR1371237, SRR1371236, SRR1368960, SRR1367372, SRR1363519, SRR1363518, SRR1363517, SRR1363516, SRR1363496, SRR1363495, SRR1363103, SRR1363102, SRR1346213, SRR1346212, SRR1346119, SRR1346118, SRR1346117, SRR1346116, SRR1346115, SRR1346114, SRR1346112, SRR1346111, SRR1346110, SRR1346109, SRR1344836, SRR1343610, SRR1343576, SRR1343572, SRR1342457, SRR1342455, SRR1342454, SRR1342452, SRR1342451, SRR1342450, SRR1342206, SRR1342205, SRR1342204, SRR1342203, SRR1342116, SRR1342113, SRR1342112, SRR1341918, SRR1340416, SRR1340394, SRR1339902, SRR1339507, SRR1339474, SRR1339463, SRR1336283, SRR1335741, SRR1335740, SRR1335739, SRR1335738, SRR1335737, SRR1335736, SRR1335735, SRR1335733, SRR1335732, SRR1335731, SRR1334918, SRR1334917, SRR1334916, SRR1334912, SRR1334911, SRR1334844, SRR1334843, SRR1334840, SRR1334838, SRR1332094, SRR1332093, SRR1330268, SRR1330252, SRR1330251, SRR1330250, SRR1326962, SRR1323745, SRR1321143, SRR1315544, SRR1315543, SRR1315542, SRR1315541, SRR1315540, SRR1314706, SRR1314602, SRR1314211, SRR1313341, SRR1313314, SRR1313276, SRR1313233, SRR1313232, SRR1313231, SRR1313230, SRR1312067, SRR1312066, SRR1311177, SRR1311176, SRR1311175, SRR1311174, SRR1310330, SRR1310329, SRR1307158, SRR1307157, SRR1307156, SRR1307155, SRR1307154, SRR1307153, SRR1304899, SRR1304898, SRR1304897, SRR1304896, SRR1304889, SRR1304888, SRR1304887, SRR1304886, SRR1304885, SRR1304884, SRR1303780, SRR1303544, SRR1303543, SRR1303407, SRR1302622, SRR1302620, SRR1302619, SRR1302618, SRR1302617, SRR1302616,

SRR1302614, SRR1302612, SRR1302273, SRR1302272, SRR1302271, SRR1302270,
SRR1302269, SRR1302268, SRR1302064, SRR1302063, SRR1302060, SRR1302059,
SRR1302047, SRR1302045, SRR1302043, SRR1302042, SRR1302041, SRR1301039,
SRR1300837, SRR1300836, SRR1300834, SRR1300832, SRR1300831, SRR1300790,
SRR1300788, SRR1300787, SRR1300786, SRR1300785, SRR1300784, SRR1300783,
SRR1300619, SRR1300618, SRR1300617, SRR1300615, SRR1300543, SRR1300542,
SRR1300541, SRR1300534, SRR1300524, SRR1300516, SRR1300509, SRR1300505,
SRR1300458, SRR1300457, SRR1300456, SRR1300455, SRR1300454, SRR1300453,
SRR1300442, SRR1300441, SRR1300438, SRR1300437, SRR1300428, SRR1300422,
SRR1300421, SRR1300420, SRR1300389, SRR1300379, SRR1300378, SRR1300367,
SRR1300362, SRR1300361, SRR1300342, SRR1300323, SRR1300322, SRR1300318,
SRR1300298, SRR1300297, SRR1300295, SRR1300254, SRR1300253, SRR1300252,
SRR1300251, SRR1300250, SRR1300249, SRR1300248, SRR1300224, SRR1299180,
SRR1299122, SRR1299121, SRR1299120, SRR1299119, SRR1299118, SRR1299117,
SRR1299018, SRR1299017, SRR1299016, SRR1299015, SRR1299014, SRR1299013,
SRR1299009, SRR1299008, SRR1299007, SRR1299006, SRR1299005, SRR1299003,
SRR1299002, SRR1299001, SRR1299000, SRR1298999, SRR1298998, SRR1298996,
SRR1298986, SRR1298985, SRR1298938, SRR1298820, SRR1298819, SRR1298818,
SRR1298817, SRR1298791, SRR1298790, SRR1298789, SRR1298777, SRR1298776,
SRR1298775, SRR1298766, SRR1298758, SRR1298729, SRR1298728, SRR1298727,
SRR1298726, SRR1298725, SRR1298724, SRR1298723, SRR1298722, SRR1298721,
SRR1298720, SRR1298719, SRR1298691, SRR1298690, SRR1298689, SRR1298688,
SRR1298687, SRR1298686, SRR1298685, SRR1298684, SRR1298683, SRR1298682,
SRR1298681, SRR1298680, SRR1298679, SRR1298678, SRR1298677, SRR1298676,
SRR1298675, SRR1298674, SRR1298673, SRR1298672, SRR1298671, SRR1298670,
SRR1298669, SRR1298668, SRR1298667, SRR1298666, SRR1298665, SRR1298664,
SRR1298663, SRR1298662, SRR1298661, SRR1298660, SRR1298659, SRR1298658,
SRR1298657, SRR1298656, SRR1298655, SRR1298654, SRR1298653, SRR1298652,
SRR1298651, SRR1298650, SRR1298649, SRR1298648, SRR1298647, SRR1298646,
SRR1298645, SRR1298644, SRR1298643, SRR1298642, SRR1298641, SRR1298640,
SRR1298639, SRR1298638, SRR1298637, SRR1298636, SRR1298635, SRR1298634,
SRR1298633, SRR1298632, SRR1298631, SRR1298630, SRR1298629, SRR1298628,
SRR1298627, SRR1298626, SRR1298625, SRR1298624, SRR1298623, SRR1298622,
SRR1298621, SRR1298620, SRR1298619, SRR1298618, SRR1298617, SRR1298616,
SRR1298615, SRR1298614, SRR1298613, SRR1298612, SRR1298611, SRR1298610,
SRR1298609, SRR1298608, SRR1298607, SRR1298606, SRR1298605, SRR1298604,
SRR1298603, SRR1298602, SRR1298445, SRR1298444, SRR1298443, SRR1298442,
SRR1298441, SRR1298440, SRR1298439, SRR1298438, SRR1298437, SRR1298436,
SRR1298435, SRR1298434, SRR1298433, SRR1298432, SRR1298431, SRR1298430,
SRR1298429, SRR1298428, SRR1298376, SRR1298375, SRR1297361, SRR1297360,
SRR1297359, SRR1297358, SRR1297357, SRR1297356, SRR1297355, SRR1297354,
SRR1297353, SRR1297352, SRR1297351, SRR1297350, SRR1297349, SRR1297348,

SRR1295665, SRR1295664, SRR1295663, SRR1295662, SRR1295661, SRR1295660,
SRR1295659, SRR1295658, SRR1295657, SRR1295656, SRR1295655, SRR1295654,
SRR1295653, SRR1295652, SRR1295651, SRR1295650, SRR1295649, SRR1295648,
SRR1295647, SRR1295646, SRR1295571, SRR1295566, SRR1295565, SRR1295563,
SRR1295557, SRR1295531, SRR1295530, SRR1295529, SRR1295528, SRR1295527,
SRR1295526, SRR1295525, SRR1295524, SRR1295523, SRR1295522, SRR1295521,
SRR1295520, SRR1295519, SRR1295518, SRR1295517, SRR1295516, SRR1294487,
SRR1294486, SRR1294485, SRR1294484, SRR1294483, SRR1294482, SRR1294481,
SRR1294480, SRR1294479, SRR1294478, SRR1294477, SRR1294476, SRR1294475,
SRR1294474, SRR1294459, SRR1294458, SRR1294427, SRR1294420, SRR1294419,
SRR1293815, SRR1293814, SRR1293691, SRR1293690, SRR1293689, SRR1293494,
SRR1293493, SRR1293492, SRR1293491, SRR1293490, SRR1293489, SRR1293488,
SRR1293487, SRR1293486, SRR1293485, SRR1293484, SRR1293483, SRR1293482,
SRR1293481, SRR1293480, SRR1293479, SRR1293478, SRR1293477, SRR1293476,
SRR1293475, SRR1293474, SRR1293473, SRR1293472, SRR1293471, SRR1293470,
SRR1293469, SRR1293468, SRR1293467, SRR1293466, SRR1293465, SRR1293464,
SRR1293463, SRR1293462, SRR1293461, SRR1293460, SRR1293459, SRR1293458,
SRR1293457, SRR1293456, SRR1293455, SRR1293454, SRR1293453, SRR1293452,
SRR1293451, SRR1293450, SRR1293449, SRR1293448, SRR1293447, SRR1293446,
SRR1293445, SRR1293444, SRR1293443, SRR1293442, SRR1293441, SRR1293440,
SRR1293439, SRR1293438, SRR1293437, SRR1293436, SRR1293435, SRR1293434,
SRR1293433, SRR1293432, SRR1293431, SRR1293430, SRR1293429, SRR1293428,
SRR1293427, SRR1293426, SRR1293425, SRR1293424, SRR1293423, SRR1293377,
SRR1293357, SRR1293228, SRR1292929, SRR1292928, SRR1292927, SRR1292926,
SRR1292925, SRR1292924, SRR1292879, SRR1292878, SRR1292877, SRR1292876,
SRR1292875, SRR1292874, SRR1292615, SRR1292611, SRR1292497, SRR1292210,
SRR1292209, SRR1292208, SRR1292207, SRR1292206, SRR1292205, SRR1291243,
SRR1291171, SRR1291170, SRR1291169, SRR1290852, SRR1290851, SRR1290850,
SRR1290848, SRR1290847, SRR1290846, SRR1289655, SRR1288370, SRR1288369,
SRR1288368, SRR1288367, SRR1288366, SRR1288365, SRR1288364, SRR1288363,
SRR1287987, SRR1287986, SRR1287678, SRR1287677, SRR1287676, SRR1287675,
SRR1287674, SRR1287673, SRR1287672, SRR1287671, SRR1287670, SRR1287669,
SRR1287668, SRR1287667, SRR1287666, SRR1287665, SRR1287664, SRR1287663,
SRR1287659, SRR1287658, SRR1287657, SRR1287029, SRR1287028, SRR1287027,
SRR1287026, SRR1287025, SRR1286088, SRR1284619, SRR1284618, SRR1284617,
SRR1284616, SRR1284615, SRR1284614, SRR1284613, SRR1284612, SRR1284611,
SRR1284610, SRR1284609, SRR1284608, SRR1284607, SRR1284606, SRR1284605,
SRR1284604, SRR1284603, SRR1284602, SRR1284601, SRR1284600, SRR1284599,
SRR1284598, SRR1284597, SRR1284596, SRR1284595, SRR1284594, SRR1284593,
SRR1284592, SRR1284591, SRR1284590, SRR1284589, SRR1284588, SRR1284587,
SRR1284586, SRR1284585, SRR1284584, SRR1284583, SRR1284582, SRR1284581,
SRR1284580, SRR1284579, SRR1284578, SRR1284577, SRR1284576, SRR1284575,

SRR1284574, SRR1284573, SRR1284572, SRR1284571, SRR1284570, SRR1284569,
SRR1284568, SRR1284567, SRR1284566, SRR1284565, SRR1284564, SRR1284563,
SRR1284562, SRR1284561, SRR1284560, SRR1284559, SRR1284558, SRR1284557,
SRR1284556, SRR1284555, SRR1284554, SRR1284553, SRR1284552, SRR1284551,
SRR1284550, SRR1284549, SRR1284548, SRR1284547, SRR1284546, SRR1284545,
SRR1284544, SRR1284543, SRR1284542, SRR1284541, SRR1284540, SRR1284539,
SRR1284538, SRR1284537, SRR1284536, SRR1284535, SRR1284534, SRR1284533,
SRR1284532, SRR1284531, SRR1284530, SRR1284529, SRR1284528, SRR1284527,
SRR1284526, SRR1284525, SRR1284524, SRR1284523, SRR1284522, SRR1284521,
SRR1284520, SRR1284519, SRR1284518, SRR1284517, SRR1284516, SRR1284515,
SRR1284514, SRR1284513, SRR1284512, SRR1284511, SRR1284510, SRR1284509,
SRR1284508, SRR1284507, SRR1284506, SRR1284505, SRR1284504, SRR1284503,
SRR1284502, SRR1284449, SRR1284448, SRR1284228, SRR1284227, SRR1284225,
SRR1284053, SRR1284052, SRR1284051, SRR1284050, SRR1283945, SRR1283944,
SRR1283943, SRR1283438, SRR1283218, SRR1283203, SRR1283202, SRR1283201,
SRR1283200, SRR1283100, SRR1283099, SRR1283098, SRR1283097, SRR1283096,
SRR1283095, SRR1283094, SRR1283093, SRR1283092, SRR1283091, SRR1283090,
SRR1283089, SRR1283088, SRR1283087, SRR1283086, SRR1283085, SRR1283084,
SRR1283083, SRR1283082, SRR1283081, SRR1283080, SRR1283079, SRR1283078,
SRR1283077, SRR1283076, SRR1283075, SRR1283074, SRR1283073, SRR1283072,
SRR1283071, SRR1282422, SRR1282421, SRR1282050, SRR1282049, SRR1282048,
SRR1282047, SRR1282046, SRR1282045, SRR1282044, SRR1282043, SRR1282042,
SRR1282041, SRR1282040, SRR1282039, SRR1278761, SRR1276212, SRR1276211,
SRR1276210, SRR1276209, SRR1276208, SRR1276207, SRR1276206, SRR1276205,
SRR1276204, SRR1276202, SRR1276201, SRR1276199, SRR1276197, SRR1276196,
SRR1276195, SRR1276194, SRR1276193, SRR1276191, SRR1276190, SRR1276188,
SRR1276186, SRR1276185, SRR1276184, SRR1276182, SRR1276181, SRR1276179,
SRR1276178, SRR1276176, SRR1276175, SRR1276174, SRR1275405, SRR1275404,
SRR1275403, SRR1275402, SRR1274922, SRR1273418, SRR1273416, SRR1273414,
SRR1273412, SRR1273408, SRR1273407, SRR1273406, SRR1273405, SRR1273395,
SRR1273180, SRR1273070, SRR1272414, SRR1272413, SRR1272412, SRR1272411,
SRR1272410, SRR1272409, SRR1272408, SRR1272407, SRR1272406, SRR1272405,
SRR1272404, SRR1272403, SRR1272402, SRR1272401, SRR1272400, SRR1272399,
SRR1272398, SRR1272397, SRR1272396, SRR1272395, SRR1272394, SRR1272393,
SRR1272392, SRR1272391, SRR1272390, SRR1272389, SRR1272388, SRR1272387,
SRR1272386, SRR1272385, SRR1272384, SRR1272383, SRR1272382, SRR1272381,
SRR1272380, SRR1272379, SRR1272378, SRR1272377, SRR1272376, SRR1272375,
SRR1272374, SRR1272373, SRR1272372, SRR1272371, SRR1272370, SRR1272369,
SRR1272368, SRR1272367, SRR1272366, SRR1272365, SRR1272364, SRR1272363,
SRR1272362, SRR1272361, SRR1272360, SRR1272359, SRR1272358, SRR1272357,
SRR1272356, SRR1272355, SRR1272354, SRR1272353, SRR1272352, SRR1272351,
SRR1272350, SRR1272349, SRR1272348, SRR1272347, SRR1272346, SRR1272345,

SRR1272344, SRR1272343, SRR1272342, SRR1272341, SRR1272340, SRR1272339,
SRR1272338, SRR1272337, SRR1272336, SRR1272335, SRR1272334, SRR1272333,
SRR1272332, SRR1272331, SRR1272330, SRR1272329, SRR1272129, SRR1272128,
SRR1272127, SRR1272126, SRR1272125, SRR1272124, SRR1272123, SRR1272122,
SRR1272121, SRR1272120, SRR1272119, SRR1272118, SRR1272117, SRR1272116,
SRR1272115, SRR1272114, SRR1272113, SRR1272112, SRR1272111, SRR1272110,
SRR1272109, SRR1272108, SRR1272107, SRR1272106, SRR1272105, SRR1272104,
SRR1272103, SRR1272102, SRR1272101, SRR1272100, SRR1272099, SRR1272098,
SRR1272097, SRR1272096, SRR1272095, SRR1272094, SRR1272093, SRR1272092,
SRR1272091, SRR1272090, SRR1272089, SRR1272088, SRR1272087, SRR1272086,
SRR1272085, SRR1272084, SRR1272083, SRR1272082, SRR1272081, SRR1272080,
SRR1272079, SRR1272078, SRR1272077, SRR1272076, SRR1272075, SRR1272074,
SRR1272073, SRR1272072, SRR1272071, SRR1272070, SRR1272069, SRR1272068,
SRR1272067, SRR1272066, SRR1272065, SRR1272064, SRR1272063, SRR1272062,
SRR1272061, SRR1272060, SRR1272059, SRR1272058, SRR1272057, SRR1272056,
SRR1272055, SRR1272054, SRR1272053, SRR1272052, SRR1272051, SRR1272050,
SRR1272049, SRR1272048, SRR1272047, SRR1272046, SRR1272045, SRR1272044,
SRR1272043, SRR1272042, SRR1272041, SRR1272040, SRR1272039, SRR1272038,
SRR1272037, SRR1272036, SRR1272024, SRR1272023, SRR1272022, SRR1272021,
SRR1271859, SRR1271858, SRR1271857, SRR1271757, SRR1271756, SRR1271755,
SRR1271754, SRR1271753, SRR1271752, SRR1271751, SRR1271750, SRR1271749,
SRR1271748, SRR1271747, SRR1271746, SRR1271575, SRR1271574, SRR1271573,
SRR1271572, SRR1271568, SRR1271562, SRR1271560, SRR1271559, SRR1271558,
SRR1271557, SRR1270137, SRR1270136, SRR1270135, SRR1270134, SRR1270133,
SRR1270132, SRR1269651, SRR1269650, SRR1269649, SRR1269644, SRR1269627,
SRR1269499, SRR1269325, SRR1269324, SRR1269305, SRR1268102, SRR1268101,
SRR1268100, SRR1268099, SRR1268098, SRR1268097, SRR1268096, SRR1268095,
SRR1268094, SRR1268093, SRR1268092, SRR1268091, SRR1268090, SRR1268089,
SRR1268088, SRR1268087, SRR1268086, SRR1268085, SRR1268084, SRR1268083,
SRR1268082, SRR1267903, SRR1267060, SRR1267059, SRR1267058, SRR1267057,
SRR1267056, SRR1267055, SRR1267054, SRR1267053, SRR1267052, SRR1267051,
SRR1267050, SRR1267049, SRR1267048, SRR1267047, SRR1267046, SRR1267045,
SRR1267044, SRR1267043, SRR1267042, SRR1267041, SRR1267040, SRR1267039,
SRR1267038, SRR1267037, SRR1267036, SRR1267035, SRR1267034, SRR1267033,
SRR1267032, SRR1267031, SRR1267030, SRR1267029, SRR1267028, SRR1267027,
SRR1267026, SRR1267025, SRR1267024, SRR1267023, SRR1267022, SRR1267021,
SRR1267020, SRR1267018, SRR1267017, SRR1267016, SRR1267015, SRR1267014,
SRR1267013, SRR1267012, SRR1267011, SRR1267010, SRR1267009, SRR1267008,
SRR1267007, SRR1267006, SRR1267005, SRR1267004, SRR1267003, SRR1267002,
SRR1267001, SRR1267000, SRR1266999, SRR1266997, SRR1266996, SRR1266995,
SRR1266994, SRR1266993, SRR1266992, SRR1266991, SRR1266990, SRR1266989,
SRR1266988, SRR1266987, SRR1266986, SRR1266985, SRR1266984, SRR1266983,

SRR1266982, SRR1266943, SRR1266942, SRR1266941, SRR1266940, SRR1266939,
SRR1266938, SRR1266937, SRR1266936, SRR1266935, SRR1266934, SRR1266933,
SRR1266932, SRR1266931, SRR1266930, SRR1266929, SRR1266927, SRR1266926,
SRR1266925, SRR1266923, SRR1266922, SRR1266921, SRR1266920, SRR1266919,
SRR1266918, SRR1266917, SRR1266916, SRR1266915, SRR1266914, SRR1266913,
SRR1266912, SRR1266911, SRR1266910, SRR1266909, SRR1266908, SRR1266907,
SRR1266906, SRR1266905, SRR1266904, SRR1266903, SRR1266902, SRR1266901,
SRR1266900, SRR1266899, SRR1266898, SRR1266897, SRR1266896, SRR1266895,
SRR1266894, SRR1266893, SRR1266892, SRR1266891, SRR1266890, SRR1266889,
SRR1266888, SRR1266887, SRR1266886, SRR1266885, SRR1266884, SRR1266883,
SRR1266882, SRR1266881, SRR1266880, SRR1266879, SRR1266871, SRR1266870,
SRR1266869, SRR1266868, SRR1266867, SRR1266866, SRR1266865, SRR1266864,
SRR1266863, SRR1266862, SRR1266861, SRR1266860, SRR1266859, SRR1266858,
SRR1266857, SRR1266856, SRR1266855, SRR1266854, SRR1266853, SRR1266852,
SRR1266851, SRR1266850, SRR1266849, SRR1266848, SRR1266847, SRR1266846,
SRR1266845, SRR1266844, SRR1266843, SRR1266842, SRR1266841, SRR1266840,
SRR1266839, SRR1266838, SRR1266837, SRR1266836, SRR1266821, SRR1266820,
SRR1266819, SRR1266818, SRR1266817, SRR1266816, SRR1266815, SRR1266814,
SRR1266813, SRR1266812, SRR1266811, SRR1266810, SRR1266809, SRR1266808,
SRR1266807, SRR1266806, SRR1266805, SRR1266804, SRR1266803, SRR1266802,
SRR1266801, SRR1266800, SRR1266799, SRR1266798, SRR1266797, SRR1266795,
SRR1266794, SRR1266793, SRR1266792, SRR1266791, SRR1266790, SRR1266789,
SRR1266788, SRR1266787, SRR1266786, SRR1266785, SRR1266784, SRR1266783,
SRR1266782, SRR1266781, SRR1266780, SRR1266779, SRR1266778, SRR1266777,
SRR1266776, SRR1266775, SRR1266774, SRR1266773, SRR1266772, SRR1266770,
SRR1266278, SRR1266259, SRR1266140, SRR1266138, SRR1266113, SRR1266112,
SRR1266110, SRR1266017, SRR1266016, SRR1266015, SRR1266014, SRR1266013,
SRR1266012, SRR1266011, SRR1266010, SRR1266009, SRR1266008, SRR1266007,
SRR1266006, SRR1266005, SRR1266004, SRR1266003, SRR1266001, SRR1266000,
SRR1265999, SRR1265998, SRR1265994, SRR1265989, SRR1265987, SRR1265953,
SRR1265939, SRR1265898, SRR1265121, SRR1265096, SRR1265074, SRR1265072,
SRR1265058, SRR1265056, SRR1265049, SRR1265048, SRR1265047, SRR1264963,
SRR1264912, SRR1264911, SRR1264910, SRR1264909, SRR1264908, SRR1264907,
SRR1264906, SRR1264905, SRR1264904, SRR1264903, SRR1264902, SRR1264901,
SRR1264900, SRR1264899, SRR1264898, SRR1264897, SRR1264896, SRR1264895,
SRR1264894, SRR1264893, SRR1264892, SRR1264891, SRR1264890, SRR1264889,
SRR1264888, SRR1264887, SRR1264886, SRR1264885, SRR1264884, SRR1264883,
SRR1264882, SRR1264881, SRR1264880, SRR1264879, SRR1264878, SRR1264877,
SRR1264876, SRR1264875, SRR1264874, SRR1264873, SRR1264872, SRR1264871,
SRR1264870, SRR1264869, SRR1264868, SRR1264867, SRR1264866, SRR1264865,
SRR1264864, SRR1264863, SRR1264862, SRR1264861, SRR1264860, SRR1264859,
SRR1264858, SRR1264857, SRR1264856, SRR1264855, SRR1264854, SRR1264853,

SRR1264852, SRR1264851, SRR1264850, SRR1264849, SRR1264848, SRR1264847, SRR1264846, SRR1264845, SRR1264844, SRR1264843, SRR1264842, SRR1264841, SRR1264840, SRR1264839, SRR1264838, SRR1264837, SRR1264836, SRR1264835, SRR1264834, SRR1264833, SRR1264832, SRR1264831, SRR1264830, SRR1264702, SRR1264701, SRR1264700, SRR1264699, SRR1264698, SRR1264697, SRR1264696, SRR1264695, SRR1264634, SRR1264633, SRR1264632, SRR1264631, SRR1264610, SRR1264609, SRR1264608, SRR1264036, SRR1264035, SRR1264034, SRR1264033, SRR1264032, SRR1264031, SRR1264030, SRR1264029, SRR1264028, SRR1264026, SRR1264024, SRR1264023, SRR1263034, SRR1263033, SRR1262602, SRR1262601, SRR1262546, SRR1262545, SRR1262409, SRR1262408, SRR1262407, SRR1262406, SRR1262405, SRR1262404, SRR1262389, SRR1262385, SRR1262384, SRR1262373, SRR1262365, SRR1262280, SRR1261962, SRR1261960, SRR1261956, SRR1261955, SRR1261866, SRR1261509, SRR1261351, SRR1260996, SRR1260604, SRR1260603, SRR1260602, SRR1260601, SRR1260346, SRR1260339, SRR1260336, SRR1260335, SRR1260330, SRR1260325, SRR1260324, SRR1260145, SRR1260038, SRR1260037, SRR1260036, SRR1260035, SRR1260034, SRR1260033, SRR1260032, SRR1259707, SRR1259431, SRR1259332, SRR1258877, SRR1258876, SRR1258875, SRR1258873, SRR1258864, SRR1258819, SRR1258762, SRR1258761, SRR1258338, SRR1258337, SRR1258336, SRR1258335, SRR1258328, SRR1258327, SRR1258326, SRR1258118, SRR1258117, SRR1258112, SRR1258106, SRR1258104, SRR1257428, SRR1257427, SRR1257426, SRR1257425, SRR1257424, SRR1257423, SRR1257422, SRR1257408, SRR1257407, SRR1257406, SRR1257405, SRR1257404, SRR1257403, SRR1257402, SRR1257401, SRR1257398, SRR1257397, SRR1257396, SRR1257395, SRR1257394, SRR1257393, SRR1257392, SRR1257391, SRR1257333, SRR1257327, SRR1257326, SRR1257325, SRR1257324, SRR1257323, SRR1257322, SRR1257321, SRR1257320, SRR1257176, SRR1252009, SRR1251976, SRR1251974, SRR1251973, SRR1251972, SRR1251971, SRR1251970, SRR1251969, SRR1251968, SRR1251967, SRR1251966, SRR1251965, SRR1251964, SRR1251963, SRR1251962, SRR1251961, SRR1251960, SRR1251959, SRR1251958, SRR1251957, SRR1251572, SRR1251571, SRR1251570, SRR1251569, SRR1251568, SRR1251567, SRR1250821, SRR1248501, SRR1248500, SRR1248499, SRR1248498, SRR1248443, SRR1248442, SRR1248441, SRR1248345, SRR1248284, SRR1248281, SRR1246868, SRR1246867, SRR1246866, SRR1246865, SRR1244756, SRR1244275, SRR1243179, SRR1240717, SRR1240716, SRR1240715, SRR1240714, SRR1240713, SRR1240712, SRR1240711, SRR1240710, SRR1240709, SRR1240708, SRR1240707, SRR1240706, SRR1240705, SRR1240704, SRR1240703, SRR1240702, SRR1240701, SRR1240700, SRR1240699, SRR1240698, SRR1240697, SRR1240437, SRR1239544, SRR1239543, SRR1239542, SRR1239541, SRR1239540, SRR1239539, SRR1239538, SRR1239537, SRR1239536, SRR1239535, SRR1239534, SRR1239533, SRR1239532, SRR1239531, SRR1239530, SRR1239529, SRR1239528, SRR1239527, SRR1239526, SRR1239525, SRR1239524, SRR1239523, SRR1239522, SRR1239364, SRR1239363, SRR1239362, SRR1239315, SRR1239314, SRR1238724, SRR1238720, SRR1238719, SRR1238718, SRR1238717, SRR1238715, SRR1238682,

SRR1238681, SRR1238680, SRR1238679, SRR1238678, SRR1238677, SRR1238676,
SRR1238675, SRR1238653, SRR1238560, SRR1238143, SRR1238118, SRR1238088,
SRR1238076, SRR1238074, SRR1238073, SRR1238072, SRR1238071, SRR1238070,
SRR1238069, SRR1238068, SRR1238067, SRR1238066, SRR1238065, SRR1238064,
SRR1238063, SRR1238062, SRR1238061, SRR1238060, SRR1238059, SRR1238058,
SRR1238057, SRR1238056, SRR1238055, SRR1238054, SRR1238052, SRR1238051,
SRR1237796, SRR1237611, SRR1237610, SRR1237609, SRR1237587, SRR1237584,
SRR1237217, SRR1233169, SRR1233168, SRR1233167, SRR1233162, SRR1233159,
SRR1233158, SRR1233157, SRR1233156, SRR1233155, SRR1233154, SRR1233024,
SRR1232490, SRR1232489, SRR1232488, SRR1232487, SRR1232486, SRR1232485,
SRR1232484, SRR1232483, SRR1232482, SRR1232481, SRR1232480, SRR1232479,
SRR1232478, SRR1232477, SRR1232476, SRR1232301, SRR1232054, SRR1232022,
SRR1231563, SRR1231519, SRR1231518, SRR1231517, SRR1231516, SRR1231514,
SRR1231513, SRR1231512, SRR1231511, SRR1231510, SRR1231509, SRR1231508,
SRR1231507, SRR1231506, SRR1231505, SRR1231504, SRR1231503, SRR1231502,
SRR1231501, SRR1231500, SRR1231499, SRR1231498, SRR1231497, SRR1230929,
SRR1230928, SRR1230927, SRR1230926, SRR1230925, SRR1230924, SRR1230923,
SRR1230922, SRR1230921, SRR1230920, SRR1230919, SRR1230918, SRR1230917,
SRR1230916, SRR1230915, SRR1228265, SRR1228264, SRR1228263, SRR1228262,
SRR1228261, SRR1228260, SRR1228259, SRR1228258, SRR1228257, SRR1228256,
SRR1228255, SRR1228254, SRR1228253, SRR1228252, SRR1228251, SRR1228250,
SRR1228249, SRR1228248, SRR1228247, SRR1228246, SRR1228245, SRR1228244,
SRR1228243, SRR1228242, SRR1228241, SRR1228240, SRR1228238, SRR1228237,
SRR1228236, SRR1228235, SRR1228234, SRR1228232, SRR1228231, SRR1228230,
SRR1228229, SRR1228228, SRR1228227, SRR1228226, SRR1228225, SRR1228223,
SRR1228222, SRR1228221, SRR1228220, SRR1228219, SRR1228218, SRR1228217,
SRR1228216, SRR1228215, SRR1228214, SRR1228213, SRR1228212, SRR1228211,
SRR1228210, SRR1228209, SRR1228208, SRR1228207, SRR1228206, SRR1228205,
SRR1228204, SRR1227842, SRR1226614, SRR1226613, SRR1223239, SRR1223238,
SRR1223226, SRR1223225, SRR1222985, SRR1222670, SRR1222669, SRR1222668,
SRR1222667, SRR1222666, SRR1222665, SRR1222664, SRR1222663, SRR1222662,
SRR1222661, SRR1222660, SRR1222659, SRR1222658, SRR1222657, SRR1222656,
SRR1222655, SRR1222654, SRR1222653, SRR1222485, SRR1222484, SRR1222483,
SRR1222482, SRR1222481, SRR1222480, SRR1222479, SRR1222478, SRR1222477,
SRR1222476, SRR1222475, SRR1222474, SRR1222473, SRR1222472, SRR1222471,
SRR1222470, SRR1222469, SRR1222468, SRR1222467, SRR1222466, SRR1222465,
SRR1222464, SRR1222463, SRR1222462, SRR1222461, SRR1222460, SRR1222459,
SRR1222458, SRR1222457, SRR1222456, SRR1222455, SRR1222454, SRR1222453,
SRR1222452, SRR1222451, SRR1222450, SRR1222449, SRR1222448, SRR1222447,
SRR1222446, SRR1222445, SRR1222444, SRR1222443, SRR1222442, SRR1222441,
SRR1222440, SRR1222439, SRR1222438, SRR1222437, SRR1222436, SRR1220647,
SRR1220646, SRR1220645, SRR1220207, SRR1219989, SRR1219796, SRR1219646,

SRR1219644, SRR1219535, SRR1217458, SRR1217457, SRR1217456, SRR1217455,
SRR1217454, SRR1217453, SRR1217451, SRR1217450, SRR1217449, SRR1217448,
SRR1217447, SRR1217446, SRR1217445, SRR1217444, SRR1217443, SRR1217442,
SRR1217441, SRR1217440, SRR1217002, SRR1217001, SRR1217000, SRR1216999,
SRR1216998, SRR1216997, SRR1216996, SRR1216995, SRR1216595, SRR1216594,
SRR1216593, SRR1216592, SRR1216581, SRR1213747, SRR1213746, SRR1213745,
SRR1213744, SRR1213696, SRR1213695, SRR1213694, SRR1213693, SRR1213692,
SRR1213691, SRR1213690, SRR1213588, SRR1213586, SRR1213584, SRR1213583,
SRR1213582, SRR1213581, SRR1213575, SRR1213574, SRR1213571, SRR1213570,
SRR1213251, SRR1213250, SRR1213249, SRR1213248, SRR1213247, SRR1213246,
SRR1213245, SRR1213244, SRR1213149, SRR1213146, SRR1213145, SRR1213144,
SRR1213143, SRR1213142, SRR1213141, SRR1213140, SRR1213139, SRR1213138,
SRR1213137, SRR1213136, SRR1213135, SRR1213134, SRR1213133, SRR1213132,
SRR1213131, SRR1213130, SRR1213129, SRR1213128, SRR1213127, SRR1213126,
SRR1213125, SRR1213124, SRR1213123, SRR1213102, SRR1213101, SRR1213100,
SRR1213099, SRR1212929, SRR1212928, SRR1212927, SRR1212926, SRR1212868,
SRR1212867, SRR1212866, SRR1212863, SRR1212861, SRR1212584, SRR1212583,
SRR1212582, SRR1211277, SRR1211273, SRR1211022, SRR1211021, SRR1211020,
SRR1211019, SRR1211018, SRR1211017, SRR1211016, SRR1210520, SRR1210501,
SRR1210496, SRR1210495, SRR1210493, SRR1210492, SRR1210491, SRR1210490,
SRR1210489, SRR1210488, SRR1210487, SRR1210486, SRR1210485, SRR1209401,
SRR1209400, SRR1209399, SRR1209398, SRR1209397, SRR1209396, SRR1209395,
SRR1209394, SRR1209371, SRR1209308, SRR1207978, SRR1207513, SRR1207507,
SRR1207503, SRR1207499, SRR1207496, SRR1207491, SRR1207477, SRR1207411,
SRR1207290, SRR1207289, SRR1207288, SRR1207287, SRR1207286, SRR1207285,
SRR1207284, SRR1207283, SRR1207277, SRR1207201, SRR1207200, SRR1207199,
SRR1207198, SRR1207197, SRR1207196, SRR1207195, SRR1207194, SRR1206878,
SRR1206489, SRR1206488, SRR1206487, SRR1206486, SRR1206485, SRR1206484,
SRR1206483, SRR1206482, SRR1206481, SRR1206475, SRR1206474, SRR1206473,
SRR1206472, SRR1206471, SRR1206470, SRR1206469, SRR1206468, SRR1206467,
SRR1206466, SRR1206465, SRR1206464, SRR1206463, SRR1206462, SRR1206461,
SRR1206460, SRR1206459, SRR1206458, SRR1206019, SRR1205324, SRR1205323,
SRR1205322, SRR1205321, SRR1205320, SRR1205319, SRR1205318, SRR1205317,
SRR1205316, SRR1205315, SRR1205314, SRR1205313, SRR1205312, SRR1205309,
SRR1205306, SRR1205305, SRR1205304, SRR1205303, SRR1205229, SRR1204596,
SRR1203867, SRR1202302, SRR1202301, SRR1202300, SRR1202121, SRR1202120,
SRR1202118, SRR1202117, SRR1201408, SRR1201407, SRR1201406, SRR1201405,
SRR1201355, SRR1201354, SRR1201353, SRR1201352, SRR1201351, SRR1201350,
SRR1201349, SRR1201348, SRR1201347, SRR1201346, SRR1201345, SRR1201344,
SRR1201343, SRR1201342, SRR1201341, SRR1201340, SRR1200977, SRR1200976,
SRR1200975, SRR1200436, SRR1200435, SRR1200433, SRR1200432, SRR1200431,
SRR1200430, SRR1200429, SRR1200428, SRR1200427, SRR1200426, SRR1200425,

SRR1200424, SRR1200423, SRR1200422, SRR1200421, SRR1200420, SRR1200414,
SRR1200413, SRR1200412, SRR1200410, SRR1200409, SRR1200404, SRR1200403,
SRR1200387, SRR1200386, SRR1200385, SRR1200384, SRR1200383, SRR1200382,
SRR1200381, SRR1200380, SRR1200379, SRR1200378, SRR1200377, SRR1200376,
SRR1200375, SRR1200374, SRR1200373, SRR1200372, SRR1200371, SRR1200370,
SRR1200369, SRR1200368, SRR1200367, SRR1200366, SRR1200365, SRR1200343,
SRR1200298, SRR1200254, SRR1200253, SRR1200252, SRR1199375, SRR1199374,
SRR1199373, SRR1199372, SRR1199275, SRR1199274, SRR1199261, SRR1199260,
SRR1199203, SRR1199202, SRR1199200, SRR1199199, SRR1199198, SRR1199197,
SRR1199135, SRR1199132, SRR1199130, SRR1199129, SRR1199128, SRR1199127,
SRR1199125, SRR1199124, SRR1199123, SRR1199122, SRR1199121, SRR1199074,
SRR1199073, SRR1199072, SRR1199071, SRR1199070, SRR1199069, SRR1199068,
SRR1199066, SRR1199063, SRR1199030, SRR1199008, SRR1199006, SRR1199005,
SRR1199004, SRR1199003, SRR1199001, SRR1198999, SRR1198998, SRR1198847,
SRR1198846, SRR1198350, SRR1198348, SRR1198345, SRR1198343, SRR1198341,
SRR1198339, SRR1198338, SRR1198336, SRR1198335, SRR1198334, SRR1198333,
SRR1198332, SRR1198331, SRR1198330, SRR1198329, SRR1198327, SRR1198325,
SRR1198323, SRR1198322, SRR1197971, SRR1197970, SRR1197969, SRR1197746,
SRR1197573, SRR1197128, SRR1197127, SRR1197126, SRR1197125, SRR1197124,
SRR1197123, SRR1197122, SRR1197121, SRR1197120, SRR1197119, SRR1197118,
SRR1197117, SRR1196045, SRR1196029, SRR1196023, SRR1196022, SRR1195944,
SRR1195533, SRR1195282, SRR1195281, SRR1195280, SRR1195279, SRR1195025,
SRR1195024, SRR1193302, SRR1192484, SRR1192337, SRR1192336, SRR1192335,
SRR1192334, SRR1192314, SRR1192260, SRR1192259, SRR1192257, SRR1192256,
SRR1192255, SRR1192188, SRR1192173, SRR1192159, SRR1192111, SRR1192100,
SRR1192098, SRR1192089, SRR1192086, SRR1192082, SRR1192064, SRR1190495,
SRR1190494, SRR1190493, SRR1190492, SRR1190236, SRR1190227, SRR1190221,
SRR1190184, SRR1190183, SRR1190181, SRR1190180, SRR1190179, SRR1190178,
SRR1190177, SRR1190176, SRR1190175, SRR1188688, SRR1188607, SRR1188596,
SRR1188595, SRR1188594, SRR1188593, SRR1188532, SRR1188531, SRR1188517,
SRR1188506, SRR1188283, SRR1188282, SRR1188270, SRR1188265, SRR1188258,
SRR1188247, SRR1188242, SRR1188236, SRR1188230, SRR1188222, SRR1188091,
SRR1188090, SRR1188089, SRR1188088, SRR1187935, SRR1187934, SRR1187933,
SRR1187932, SRR1187864, SRR1187851, SRR1187677, SRR1187676, SRR1187675,
SRR1187674, SRR1187673, SRR1187632, SRR1186931, SRR1186871, SRR1186870,
SRR1186867, SRR1186866, SRR1186864, SRR1186863, SRR1186862, SRR1186861,
SRR1186859, SRR1186858, SRR1186847, SRR1186266, SRR1186265, SRR1186264,
SRR1185967, SRR1185564, SRR1185563, SRR1185562, SRR1185561, SRR1185560,
SRR1185559, SRR1185558, SRR1185557, SRR1185556, SRR1185555, SRR1185554,
SRR1185553, SRR1185552, SRR1185551, SRR1185550, SRR1185549, SRR1185548,
SRR1185547, SRR1185545, SRR1185544, SRR1185543, SRR1185542, SRR1185541,
SRR1185323, SRR1185322, SRR1185321, SRR1185318, SRR1185317, SRR1184472,

SRR1184460, SRR1184438, SRR1184437, SRR1184436, SRR1184287, SRR1184192, SRR1184191, SRR1184190, SRR1184189, SRR1184188, SRR1184187, SRR1183059, SRR1183038, SRR1182983, SRR1182969, SRR1182761, SRR1182760, SRR1182759, SRR1182758, SRR1182757, SRR1182650, SRR1182648, SRR1182647, SRR1182646, SRR1182476, SRR1182475, SRR1182474, SRR1182473, SRR1182462, SRR1182461, SRR1182460, SRR1182459, SRR1182458, SRR1182457, SRR1182434, SRR1182433, SRR1182404, SRR1182311, SRR1182309, SRR1182308, SRR1182307, SRR1182306, SRR1182304, SRR1182303, SRR1182302, SRR1182300, SRR1182299, SRR1182298, SRR1182296, SRR1182295, SRR1182293, SRR1182292, SRR1182289, SRR1181585, SRR1181584, SRR1181583, SRR1180229, SRR1180011, SRR1180009, SRR1180008, SRR1180007, SRR1180006, SRR1180005, SRR1180004, SRR1180003, SRR1180002, SRR1180001, SRR1180000, SRR1179999, SRR1179998, SRR1179997, SRR1179996, SRR1179995, SRR1179994, SRR1179993, SRR1179992, SRR1179991, SRR1179990, SRR1179989, SRR1179988, SRR1179987, SRR1179986, SRR1179985, SRR1179984, SRR1179983, SRR1179982, SRR1179981, SRR1179980, SRR1179979, SRR1179978, SRR1179977, SRR1179976, SRR1179975, SRR1179974, SRR1179973, SRR1179972, SRR1179971, SRR1179970, SRR1179969, SRR1179968, SRR1179967, SRR1179966, SRR1179965, SRR1179964, SRR1179963, SRR1179962, SRR1179961, SRR1179960, SRR1179959, SRR1179958, SRR1179957, SRR1179956, SRR1179647, SRR1179644, SRR1179643, SRR1179642, SRR1179530, SRR1179529, SRR1179528, SRR1179527, SRR1179526, SRR1179525, SRR1179524, SRR1179523, SRR1179522, SRR1179226, SRR1179199, SRR1179198, SRR1179197, SRR1179195, SRR1179194, SRR1179193, SRR1179192, SRR1179190, SRR1179189, SRR1179188, SRR1179187, SRR1178928, SRR1178926, SRR1178922, SRR1178918, SRR1178915, SRR1178914, SRR1178909, SRR1178908, SRR1178907, SRR1178906, SRR1178905, SRR1178272, SRR1178271, SRR1178251, SRR1178080, SRR1178079, SRR1177864, SRR1177863, SRR1177862, SRR1177861, SRR1177860, SRR1177859, SRR1177858, SRR1177857, SRR1177846, SRR1177845, SRR1177808, SRR1177807, SRR1177805, SRR1177802, SRR1177801, SRR1177800, SRR1177791, SRR1177790, SRR1177789, SRR1177787, SRR1177786, SRR1177785, SRR1177784, SRR1177783, SRR1177782, SRR1177781, SRR1177780, SRR1177779, SRR1177778, SRR1177777, SRR1177776, SRR1177775, SRR1177774, SRR1177773, SRR1177771, SRR1177770, SRR1177767, SRR1177766, SRR1177761, SRR1177760, SRR1177759, SRR1177758, SRR1177381, SRR1177349, SRR1177085, SRR1177084, SRR1177083, SRR1177082, SRR1177081, SRR1177080, SRR1177079, SRR1177031, SRR1177028, SRR1177012, SRR1177010, SRR1176934, SRR1176916, SRR1176915, SRR1176911, SRR1176677, SRR1176676, SRR1176674, SRR1176672, SRR1175868, SRR1175858, SRR1175856, SRR1175853, SRR1175798, SRR1175793, SRR1175784, SRR1175773, SRR1175772, SRR1175771, SRR1175687, SRR1175686, SRR1175453, SRR1174872, SRR1174871, SRR1174870, SRR1174869, SRR1174794, SRR1174791, SRR1174790, SRR1174773, SRR1174754, SRR1174752, SRR1174751, SRR1174750, SRR1174749, SRR1174748, SRR1174747, SRR1174746, SRR1174745, SRR1174744, SRR1174743, SRR1174742, SRR1174741, SRR1174740, SRR1174739,

SRR1170945, SRR1170944, SRR1170943, SRR1170942, SRR1170941, SRR1170940,
SRR1170939, SRR1170938, SRR1170937, SRR1170762, SRR1170744, SRR1170743,
SRR1170741, SRR1170739, SRR1170683, SRR1170682, SRR1170681, SRR1170680,
SRR1169655, SRR1169654, SRR1169653, SRR1169652, SRR1169651, SRR1169650,
SRR1169649, SRR1169648, SRR1169647, SRR1169646, SRR1169645, SRR1169644,
SRR1169643, SRR1169642, SRR1169641, SRR1169640, SRR1169639, SRR1169637,
SRR1169636, SRR1169635, SRR1169634, SRR1169633, SRR1169632, SRR1169631,
SRR1169630, SRR1169629, SRR1169628, SRR1169627, SRR1169626, SRR1169234,
SRR1169180, SRR1169154, SRR1169138, SRR1168887, SRR1168886, SRR1168884,
SRR1168883, SRR1168881, SRR1168880, SRR1168796, SRR1168795, SRR1168493,
SRR1168479, SRR1168437, SRR1168436, SRR1168435, SRR1168434, SRR1168432,
SRR1168431, SRR1168430, SRR1168429, SRR1168426, SRR1168425, SRR1168424,
SRR1168423, SRR1168422, SRR1168421, SRR1168404, SRR1168396, SRR1168184,
SRR1168183, SRR1168182, SRR1168181, SRR1168180, SRR1168179, SRR1168178,
SRR1168177, SRR1168176, SRR1168175, SRR1168174, SRR1168173, SRR1167984,
SRR1167034, SRR1167033, SRR1167032, SRR1166811, SRR1166806, SRR1166792,
SRR1166790, SRR1166789, SRR1166788, SRR1166786, SRR1166784, SRR1166721,
SRR1166720, SRR1166719, SRR1166718, SRR1166717, SRR1166716, SRR1166705,
SRR1166669, SRR1166668, SRR1166667, SRR1166616, SRR1166564, SRR1166455,
SRR1166454, SRR1166453, SRR1166403, SRR1166399, SRR1166398, SRR1166381,
SRR1166380, SRR1166377, SRR1166375, SRR1166374, SRR1166373, SRR1166365,
SRR1166364, SRR1166363, SRR1166362, SRR1166360, SRR1166357, SRR1166355,
SRR1166353, SRR1166350, SRR1165908, SRR1165907, SRR1165906, SRR1165905,
SRR1165904, SRR1165903, SRR1165901, SRR1165900, SRR1165877, SRR1165871,
SRR1165413, SRR1165412, SRR1165411, SRR1165410, SRR1165409, SRR1165408,
SRR1165407, SRR1165406, SRR1165405, SRR1165404, SRR1165234, SRR1165233,
SRR1165214, SRR1165208, SRR1165207, SRR1165206, SRR1165205, SRR1165204,
SRR1165202, SRR1165200, SRR1165199, SRR1165198, SRR1165197, SRR1165196,
SRR1165195, SRR1165194, SRR1165193, SRR1165192, SRR1165190, SRR1165189,
SRR1165187, SRR1165186, SRR1165185, SRR1165184, SRR1165183, SRR1165180,
SRR1165179, SRR1165092, SRR1165059, SRR1165058, SRR1165057, SRR1165056,
SRR1165055, SRR1165054, SRR1164727, SRR1164434, SRR1164433, SRR1164382,
SRR1164378, SRR1163720, SRR1163718, SRR1163717, SRR1163716, SRR1163715,
SRR1163714, SRR1163713, SRR1163712, SRR1163711, SRR1163710, SRR1163709,
SRR1163708, SRR1163707, SRR1163706, SRR1163704, SRR1163702, SRR1163701,
SRR1163700, SRR1163699, SRR1163698, SRR1163697, SRR1163696, SRR1163695,
SRR1163694, SRR1163693, SRR1163692, SRR1163691, SRR1163690, SRR1163689,
SRR1163688, SRR1163687, SRR1163686, SRR1163685, SRR1163684, SRR1163683,
SRR1163682, SRR1163681, SRR1163680, SRR1163679, SRR1163678, SRR1163677,
SRR1163676, SRR1163675, SRR1163674, SRR1163673, SRR1163672, SRR1163671,
SRR1163670, SRR1163669, SRR1163668, SRR1163667, SRR1163666, SRR1163665,
SRR1163664, SRR1163504, SRR1162940, SRR1162372, SRR1162371, SRR1162319,

SRR1161789, SRR1161788, SRR1161787, SRR1161786, SRR1161785, SRR1161784,
SRR1161783, SRR1161782, SRR1161781, SRR1161780, SRR1161779, SRR1161778,
SRR1161777, SRR1161776, SRR1161775, SRR1161774, SRR1161773, SRR1161772,
SRR1161771, SRR1161770, SRR1161769, SRR1161768, SRR1161767, SRR1161766,
SRR1161765, SRR1161764, SRR1161763, SRR1161762, SRR1161761, SRR1161760,
SRR1161759, SRR1161758, SRR1161757, SRR1161756, SRR1161755, SRR1161754,
SRR1161753, SRR1161752, SRR1161751, SRR1161750, SRR1161749, SRR1161748,
SRR1161745, SRR1161687, SRR1161686, SRR1161685, SRR1161684, SRR1161683,
SRR1161682, SRR1161681, SRR1161680, SRR1161679, SRR1161678, SRR1161677,
SRR1161676, SRR1161675, SRR1161674, SRR1161673, SRR1161672, SRR1161671,
SRR1161670, SRR1161669, SRR1161668, SRR1161667, SRR1161666, SRR1161665,
SRR1161664, SRR1161663, SRR1161662, SRR1161661, SRR1161660, SRR1161523,
SRR1161522, SRR1161521, SRR1161520, SRR1161519, SRR1161517, SRR1161448,
SRR1161445, SRR1160826, SRR1159840, SRR1159839, SRR1159838, SRR1159837,
SRR1159836, SRR1159835, SRR1159834, SRR1159833, SRR1159832, SRR1159831,
SRR1159830, SRR1159829, SRR1159828, SRR1159827, SRR1159826, SRR1159825,
SRR1159824, SRR1159823, SRR1159822, SRR1159821, SRR1158318, SRR1158317,
SRR1156952, SRR1156951, SRR1156406, SRR1156405, SRR1156272, SRR1153480,
SRR1153479, SRR1153478, SRR1153477, SRR1153476, SRR1153475, SRR1153474,
SRR1153473, SRR1153472, SRR1153471, SRR1151615, SRR1151614, SRR1151613,
SRR1151611, SRR1151610, SRR1151604, SRR1151522, SRR1151520, SRR1151448,
SRR1151362, SRR1151080, SRR1151079, SRR1150769, SRR1146620, SRR1146545,
SRR1145848, SRR1145727, SRR1145628, SRR1145627, SRR1145626, SRR1145446,
SRR1145171, SRR1145169, SRR1145168, SRR1145167, SRR1145166, SRR1145165,
SRR1145164, SRR1145163, SRR1145162, SRR1145161, SRR1145160, SRR1145159,
SRR1145158, SRR1145157, SRR1145156, SRR1145155, SRR1144845, SRR1144844,
SRR1144843, SRR1144842, SRR1144634, SRR1144633, SRR1141653, SRR1141651,
SRR1141083, SRR1141082, SRR1141081, SRR1141080, SRR1141079, SRR1141078,
SRR1141077, SRR1141076, SRR1141075, SRR1141074, SRR1141073, SRR1141072,
SRR1141071, SRR1141070, SRR1141069, SRR1141068, SRR1141067, SRR1141066,
SRR1141065, SRR1141064, SRR1141063, SRR1141062, SRR1141061, SRR1141060,
SRR1141059, SRR1141058, SRR1141057, SRR1141056, SRR1141044, SRR1141043,
SRR1141042, SRR1141041, SRR1141040, SRR1141039, SRR1141038, SRR1141037,
SRR1141036, SRR1141035, SRR1141034, SRR1141033, SRR1141032, SRR1141031,
SRR1141030, SRR1141029, SRR1141028, SRR1141027, SRR1141026, SRR1141025,
SRR1141024, SRR1140993, SRR1140992, SRR1140969, SRR1140968, SRR1140967,
SRR1140761, SRR1140120, SRR1140098, SRR1140072, SRR1139955, SRR1139454,
SRR1139349, SRR1139348, SRR1139347, SRR1139346, SRR1139345, SRR1139344,
SRR1139343, SRR1139342, SRR1139341, SRR1139340, SRR1139339, SRR1139338,
SRR1139337, SRR1139336, SRR1139335, SRR1139334, SRR1139333, SRR1139332,
SRR1139331, SRR1139330, SRR1139329, SRR1139328, SRR1139327, SRR1139326,
SRR1139325, SRR1139324, SRR1139323, SRR1139322, SRR1139321, SRR1139320,

SRR1139319, SRR1139318, SRR1139317, SRR1139316, SRR1139315, SRR1139314,
SRR1139313, SRR1139312, SRR1139311, SRR1139310, SRR1139309, SRR1139308,
SRR1139307, SRR1139306, SRR1139305, SRR1139304, SRR1139303, SRR1139302,
SRR1139301, SRR1139300, SRR1139299, SRR1139298, SRR1139297, SRR1139296,
SRR1139295, SRR1139294, SRR1139293, SRR1139292, SRR1139291, SRR1139290,
SRR1139289, SRR1139288, SRR1139287, SRR1139286, SRR1139285, SRR1139284,
SRR1139283, SRR1139282, SRR1139202, SRR1138701, SRR1138700, SRR1138699,
SRR1138698, SRR1138696, SRR1138695, SRR1138693, SRR1138692, SRR1138597,
SRR1138528, SRR1138527, SRR1138526, SRR1138525, SRR1138524, SRR1138523,
SRR1138522, SRR1138521, SRR1138520, SRR1138519, SRR1138518, SRR1138517,
SRR1138516, SRR1138515, SRR1138514, SRR1138513, SRR1138512, SRR1138511,
SRR1138510, SRR1138509, SRR1138508, SRR1138507, SRR1138506, SRR1138505,
SRR1138504, SRR1138503, SRR1138502, SRR1138501, SRR1138500, SRR1138499,
SRR1138498, SRR1138497, SRR1138496, SRR1138495, SRR1138494, SRR1138493,
SRR1138492, SRR1138491, SRR1138490, SRR1138489, SRR1138488, SRR1138487,
SRR1138486, SRR1138485, SRR1138484, SRR1138483, SRR1138482, SRR1138481,
SRR1138480, SRR1138479, SRR1138478, SRR1138477, SRR1138476, SRR1138475,
SRR1138474, SRR1138473, SRR1138472, SRR1138471, SRR1138470, SRR1138469,
SRR1138468, SRR1138467, SRR1138466, SRR1138465, SRR1138464, SRR1138463,
SRR1138462, SRR1138461, SRR1138460, SRR1138459, SRR1138458, SRR1138457,
SRR1138456, SRR1138455, SRR1138454, SRR1138453, SRR1138452, SRR1138451,
SRR1138450, SRR1138449, SRR1138448, SRR1138447, SRR1138446, SRR1138445,
SRR1138444, SRR1138443, SRR1138442, SRR1138441, SRR1138440, SRR1138439,
SRR1138438, SRR1138437, SRR1138436, SRR1138435, SRR1138434, SRR1138433,
SRR1138432, SRR1138431, SRR1138430, SRR1138429, SRR1138428, SRR1138427,
SRR1138426, SRR1138425, SRR1138424, SRR1138423, SRR1138422, SRR1138421,
SRR1138420, SRR1138419, SRR1138418, SRR1138417, SRR1138416, SRR1138415,
SRR1138414, SRR1138413, SRR1138412, SRR1138411, SRR1138410, SRR1138402,
SRR1138401, SRR1138400, SRR1138399, SRR1138398, SRR1138397, SRR1138396,
SRR1138395, SRR1138394, SRR1138393, SRR1138392, SRR1138391, SRR1137927,
SRR1137926, SRR1137925, SRR1137924, SRR1137923, SRR1137922, SRR1137438,
SRR1136657, SRR1136656, SRR1136655, SRR1136654, SRR1136653, SRR1136652,
SRR1125036, SRR1125031, SRR1125021, SRR1125018, SRR1125016, SRR1124753,
SRR1124752, SRR1124751, SRR1124750, SRR1123893, SRR1121679, SRR1121678,
SRR1121303, SRR1121302, SRR1121301, SRR1121300, SRR1121299, SRR1121298,
SRR1121297, SRR1121296, SRR1121295, SRR1121294, SRR1121293, SRR1121292,
SRR1119935, SRR1119934, SRR1119933, SRR1119932, SRR1119931, SRR1119930,
SRR1119929, SRR1119928, SRR1119927, SRR1119291, SRR1119257, SRR1119256,
SRR1119212, SRR1119211, SRR1119210, SRR1119209, SRR1119208, SRR1119207,
SRR1119206, SRR1119205, SRR1119039, SRR1119038, SRR1119037, SRR1119036,
SRR1119035, SRR1119034, SRR1119033, SRR1119032, SRR1119031, SRR1119030,
SRR1119029, SRR1119028, SRR1119027, SRR1119026, SRR1119025, SRR1119024,

SRR1119023, SRR1119022, SRR1119021, SRR1119020, SRR1119019, SRR1119018,
SRR1119017, SRR1119016, SRR1118251, SRR1118250, SRR1118249, SRR1118248,
SRR1118247, SRR1118246, SRR1117295, SRR1117255, SRR1117184, SRR1117110,
SRR1107998, SRR1107997, SRR1107996, SRR1107995, SRR1107994, SRR1107993,
SRR1107992, SRR1107991, SRR1107984, SRR1107983, SRR1107982, SRR1107981,
SRR1107980, SRR1107979, SRR1107978, SRR1107977, SRR1107956, SRR1107955,
SRR1107953, SRR1107952, SRR1107838, SRR1107782, SRR1107781, SRR1107780,
SRR1107777, SRR1107776, SRR1107774, SRR1107772, SRR1107770, SRR1107769,
SRR1107768, SRR1107765, SRR1107762, SRR1107761, SRR1107759, SRR1107758,
SRR1107757, SRR1107756, SRR1107752, SRR1107751, SRR1107749, SRR1107747,
SRR1107732, SRR1107724, SRR1107723, SRR1107639, SRR1107613, SRR1107612,
SRR1107611, SRR1107189, SRR1107179, SRR1106911, SRR1106910, SRR1106909,
SRR1106908, SRR1106907, SRR1106906, SRR1106902, SRR1106896, SRR1106894,
SRR1106893, SRR1106892, SRR1106891, SRR1106890, SRR1106889, SRR1106888,
SRR1106887, SRR1106886, SRR1106885, SRR1106884, SRR1106883, SRR1106882,
SRR1106881, SRR1106880, SRR1106879, SRR1106878, SRR1106698, SRR1106688,
SRR1106687, SRR1106640, SRR1106559, SRR1106125, SRR1105832, SRR1105831,
SRR1105830, SRR1105829, SRR1105828, SRR1105827, SRR1105826, SRR1105825,
SRR1105824, SRR1105823, SRR1105822, SRR1105788, SRR1105785, SRR1105623,
SRR1105622, SRR1105621, SRR1105620, SRR1105619, SRR1105618, SRR1105606,
SRR1105605, SRR1105604, SRR1105603, SRR1105602, SRR1105601, SRR1105600,
SRR1105599, SRR1105598, SRR1105597, SRR1105596, SRR1105595, SRR1105594,
SRR1105593, SRR1105592, SRR1105591, SRR1105590, SRR1105589, SRR1105588,
SRR1105587, SRR1105586, SRR1105585, SRR1105584, SRR1105583, SRR1105582,
SRR1105581, SRR1105580, SRR1104933, SRR1104932, SRR1104931, SRR1104924,
SRR1104923, SRR1104922, SRR1104921, SRR1104920, SRR1104901, SRR1104883,
SRR1104882, SRR1104814, SRR1104813, SRR1104812, SRR1104811, SRR1104810,
SRR1104809, SRR1104808, SRR1104807, SRR1104806, SRR1104805, SRR1104804,
SRR1104803, SRR1104755, SRR1104754, SRR1104753, SRR1104752, SRR1104750,
SRR1104749, SRR1104748, SRR1104746, SRR1104136, SRR1104135, SRR1104134,
SRR1104133, SRR1104129, SRR1104128, SRR1103934, SRR1103933, SRR1103909,
SRR1103908, SRR1103907, SRR1103906, SRR1103335, SRR1103306, SRR1103267,
SRR1089478, SRR1089477, SRR1087938, SRR1087937, SRR1087936, SRR1087935,
SRR1087934, SRR1087933, SRR1087932, SRR1087931, SRR1087930, SRR1087929,
SRR1087928, SRR1087927, SRR1087926, SRR1087925, SRR1087924, SRR1087923,
SRR1087922, SRR1087921, SRR1087920, SRR1087917, SRR1087902, SRR1086819,
SRR1084227, SRR1077210, SRR1077209, SRR1077208, SRR1077207, SRR1077206,
SRR1077205, SRR1076368, SRR1076367, SRR1068437, SRR1068422, SRR1068421,
SRR1068215, SRR1068178, SRR1068175, SRR1068174, SRR1068173, SRR1068172,
SRR1068171, SRR1068170, SRR1068169, SRR1068168, SRR1068167, SRR1068166,
SRR1068165, SRR1068163, SRR1068161, SRR1067941, SRR1067938, SRR1067935,
SRR1067933, SRR1067931, SRR1067863, SRR1067600, SRR1066782, SRR1066063,

SRR1058138, SRR1058137, SRR1058136, SRR1058135, SRR1058134, SRR1058133, SRR1058132, SRR1058131, SRR1058130, SRR1058129, SRR1058128, SRR1058127, SRR1058126, SRR1058125, SRR1058124, SRR1058123, SRR1058122, SRR1058121, SRR1058120, SRR1058119, SRR1058118, SRR1058117, SRR1058116, SRR1058115, SRR1058114, SRR1058113, SRR1058112, SRR1058111, SRR1058110, SRR1057375, SRR1057374, SRR1057373, SRR1057372, SRR1057371, SRR1057334, SRR1057333, SRR1057332, SRR1057331, SRR1057330, SRR1057329, SRR1057328, SRR1057327, SRR1057326, SRR1057325, SRR1057324, SRR1057323, SRR1057322, SRR1057321, SRR1057320, SRR1056625, SRR1056624, SRR1056623, SRR1056622, SRR1056621, SRR1056620, SRR1056619, SRR1056618, SRR1056611, SRR1056449, SRR1056448, SRR1056447, SRR1056446, SRR1056445, SRR1055949, SRR1055948, SRR1055947, SRR1055945, SRR1055944, SRR1055934, SRR1055933, SRR1055932, SRR1055922, SRR1055921, SRR1055912, SRR1055911, SRR1055910, SRR1055909, SRR1055527, SRR1055526, SRR1055447, SRR1055298, SRR1055297, SRR1055296, SRR1055295, SRR1055294, SRR1055293, SRR1055292, SRR1055291, SRR1055290, SRR1055263, SRR1055262, SRR1055261, SRR1055260, SRR1055259, SRR1055258, SRR1055257, SRR1055256, SRR1055255, SRR1055254, SRR1055253, SRR1055252, SRR1055198, SRR1055186, SRR1055182, SRR1055110, SRR1055108, SRR1055107, SRR1055106, SRR1054293, SRR1054197, SRR1054196, SRR1054194, SRR1054190, SRR1054152, SRR1054086, SRR1054007, SRR1053623, SRR1051997, SRR1051882, SRR1051360, SRR1051351, SRR1051350, SRR1051349, SRR1051348, SRR1051347, SRR1051228, SRR1051227, SRR1051225, SRR1051215, SRR1051214, SRR1051213, SRR1051211, SRR1051045, SRR1051044, SRR1051043, SRR1051042, SRR1051041, SRR1051040, SRR1051039, SRR1051038, SRR1051037, SRR1051036, SRR1051035, SRR1051034, SRR1051033, SRR1051032, SRR1051031, SRR1051030, SRR1051029, SRR1051028, SRR1051027, SRR1051026, SRR1051025, SRR1051024, SRR1051023, SRR1051022, SRR1051021, SRR1051020, SRR1051019, SRR1050902, SRR1050901, SRR1050900, SRR1050899, SRR1050898, SRR1050897, SRR1050896, SRR1050895, SRR1050894, SRR1050893, SRR1050892, SRR1050891, SRR1049974, SRR1049788, SRR1049787, SRR1049786, SRR1049785, SRR1049784, SRR1049783, SRR1049655, SRR1049648, SRR1049643, SRR1049626, SRR1049609, SRR1049592, SRR1049587, SRR1049570, SRR1049414, SRR1049413, SRR1049412, SRR1049411, SRR1049410, SRR1049409, SRR1049404, SRR1049403, SRR1049402, SRR1049401, SRR1049400, SRR1049386, SRR1049385, SRR1049384, SRR1049383, SRR1049380, SRR1049378, SRR1049377, SRR1049376, SRR1049373, SRR1049372, SRR1049371, SRR1049370, SRR1049296, SRR1049295, SRR1049294, SRR1049293, SRR1049292, SRR1049291, SRR1049290, SRR1049289, SRR1048208, SRR1048207, SRR1048206, SRR1048205, SRR1048204, SRR1048203, SRR1048202, SRR1048201, SRR1048148, SRR1048147, SRR1048146, SRR1048145, SRR1047618, SRR1047616, SRR1047614, SRR1047609, SRR1047607, SRR1047597, SRR1047592, SRR1047591, SRR1047565, SRR1047562, SRR1046942, SRR1046941, SRR1046940, SRR1046939, SRR1046938, SRR1046937, SRR1046936, SRR1046935, SRR1046934, SRR1046933, SRR1046932, SRR1046931, SRR1046930,

SRR1046929, SRR1046928, SRR1046927, SRR1046926, SRR1046925, SRR1046924,
SRR1046923, SRR1046922, SRR1046921, SRR1046920, SRR1046919, SRR1046918,
SRR1046917, SRR1046916, SRR1046915, SRR1046914, SRR1046913, SRR1046912,
SRR1046911, SRR1046910, SRR1046909, SRR1046908, SRR1046907, SRR1046906,
SRR1046905, SRR1046897, SRR1046896, SRR1046895, SRR1046894, SRR1046893,
SRR1046892, SRR1046891, SRR1046890, SRR1046889, SRR1046888, SRR1046887,
SRR1046886, SRR1046885, SRR1046884, SRR1046883, SRR1046882, SRR1046881,
SRR1046880, SRR1046879, SRR1046878, SRR1046877, SRR1046876, SRR1046875,
SRR1046874, SRR1046873, SRR1046872, SRR1046871, SRR1046870, SRR1046869,
SRR1046868, SRR1046867, SRR1046866, SRR1046865, SRR1046864, SRR1046863,
SRR1046862, SRR1046861, SRR1046860, SRR1046859, SRR1046858, SRR1046857,
SRR1046856, SRR1046855, SRR1046854, SRR1046853, SRR1046852, SRR1046851,
SRR1046850, SRR1046849, SRR1046848, SRR1046847, SRR1046810, SRR1046809,
SRR1046808, SRR1046807, SRR1046806, SRR1046805, SRR1046804, SRR1046803,
SRR1046801, SRR1046773, SRR1046772, SRR1046769, SRR1046684, SRR1046680,
SRR1046679, SRR1046678, SRR1046677, SRR1046676, SRR1046675, SRR1046674,
SRR1046673, SRR1046672, SRR1046671, SRR1046670, SRR1046669, SRR1046668,
SRR1046667, SRR1046659, SRR1046321, SRR1046160, SRR1046154, SRR1046146,
SRR1046132, SRR1046128, SRR1046051, SRR1046024, SRR1045990, SRR1045989,
SRR1045963, SRR1045959, SRR1045129, SRR1045120, SRR1045066, SRR1045051,
SRR1044982, SRR1044948, SRR1044947, SRR1044946, SRR1044945, SRR1044054,
SRR1044053, SRR1044052, SRR1044051, SRR1044050, SRR1044049, SRR1043998,
SRR1043196, SRR1043194, SRR1043179, SRR1043178, SRR1043177, SRR1043153,
SRR1043152, SRR1043144, SRR1043143, SRR1043142, SRR1043141, SRR1043140,
SRR1043139, SRR1043138, SRR1043137, SRR1043136, SRR1043135, SRR1043134,
SRR1043132, SRR1042771, SRR1042770, SRR1042769, SRR1042768, SRR1042767,
SRR1042766, SRR1042765, SRR1042764, SRR1042763, SRR1042762, SRR1042761,
SRR1042760, SRR1042759, SRR1042758, SRR1042757, SRR1042756, SRR1042755,
SRR1042754, SRR1042179, SRR1042178, SRR1042177, SRR1042176, SRR1042175,
SRR1042174, SRR1042173, SRR1042172, SRR1042171, SRR1041827, SRR1041826,
SRR1041825, SRR1041824, SRR1041823, SRR1041822, SRR1041821, SRR1041820,
SRR1041819, SRR1041818, SRR1041817, SRR1041816, SRR1041815, SRR1041814,
SRR1041813, SRR1041812, SRR1041811, SRR1041810, SRR1041809, SRR1041808,
SRR1041807, SRR1041806, SRR1041805, SRR1041804, SRR1041803, SRR1041802,
SRR1041801, SRR1041800, SRR1041799, SRR1041727, SRR1041726, SRR1041725,
SRR1041724, SRR1041723, SRR1041722, SRR1041721, SRR1041720, SRR1041678,
SRR1041677, SRR1041676, SRR1041675, SRR1041674, SRR1041673, SRR1041672,
SRR1041671, SRR1041638, SRR1041637, SRR1041636, SRR1041635, SRR1041561,
SRR1041560, SRR1041559, SRR1041558, SRR1041557, SRR1041556, SRR1041555,
SRR1041554, SRR1041553, SRR1041552, SRR1041551, SRR1041550, SRR1041549,
SRR1041548, SRR1041547, SRR1041546, SRR1041545, SRR1041544, SRR1041543,
SRR1041542, SRR1041541, SRR1041540, SRR1041538, SRR1041537, SRR1040990,

SRR1040988, SRR1040773, SRR1040772, SRR1040771, SRR1040770, SRR1040769,
SRR1040768, SRR1040767, SRR1040766, SRR1040765, SRR1040764, SRR1040727,
SRR1040726, SRR1040725, SRR1040631, SRR1040551, SRR1040531, SRR1040530,
SRR1040529, SRR1040522, SRR1040521, SRR1040497, SRR1040447, SRR1040424,
SRR1039941, SRR1039940, SRR1039939, SRR1039938, SRR1039937, SRR1039936,
SRR1039935, SRR1039934, SRR1039933, SRR1039932, SRR1039931, SRR1039930,
SRR1039929, SRR1039928, SRR1039927, SRR1039926, SRR1039925, SRR1039924,
SRR1039923, SRR1039922, SRR1039921, SRR1039920, SRR1039919, SRR1039918,
SRR1039917, SRR1039916, SRR1039915, SRR1039914, SRR1039913, SRR1039912,
SRR1039911, SRR1039910, SRR1039535, SRR1039531, SRR1039530, SRR1039527,
SRR1039526, SRR1039525, SRR1039524, SRR1039340, SRR1039339, SRR1039338,
SRR1039337, SRR1038650, SRR1038649, SRR1038648, SRR1038647, SRR1038646,
SRR1038645, SRR1038644, SRR1038643, SRR1038642, SRR1038641, SRR1038640,
SRR1038639, SRR1038486, SRR1038484, SRR1038482, SRR1038481, SRR1038450,
SRR1038437, SRR1038436, SRR1038435, SRR1038434, SRR1038433, SRR1038432,
SRR1038431, SRR1038430, SRR1038411, SRR1038410, SRR1038409, SRR1038408,
SRR1038407, SRR1038406, SRR1038405, SRR1038404, SRR1038403, SRR1038402,
SRR1038401, SRR1038400, SRR1038399, SRR1038398, SRR1038397, SRR1038396,
SRR1038394, SRR1038392, SRR1038391, SRR1038390, SRR1038384, SRR1038383,
SRR1038375, SRR1038374, SRR1038373, SRR1038372, SRR1038371, SRR1038370,
SRR1038369, SRR1038368, SRR1038367, SRR1038366, SRR1038365, SRR1038364,
SRR1038363, SRR1038362, SRR1038361, SRR1038360, SRR1037376, SRR1037375,
SRR1037265, SRR1037138, SRR1037137, SRR1037136, SRR1036662, SRR1036599,
SRR1036351, SRR1036350, SRR1036349, SRR1036348, SRR1036347, SRR1036346,
SRR1036345, SRR1036344, SRR1036343, SRR1036342, SRR1036341, SRR1036340,
SRR1035985, SRR1035932, SRR1035231, SRR1035230, SRR1035229, SRR1035228,
SRR1035227, SRR1035226, SRR1035225, SRR1035127, SRR1035126, SRR1034826,
SRR1034825, SRR1034824, SRR1034823, SRR1034822, SRR1034821, SRR1034820,
SRR1034819, SRR1034818, SRR1033819, SRR1033818, SRR1033817, SRR1033816,
SRR1033815, SRR1033814, SRR1033813, SRR1033812, SRR1033811, SRR1033810,
SRR1033809, SRR1033680, SRR1033647, SRR1033646, SRR1032900, SRR1032481,
SRR1032216, SRR1032215, SRR1032196, SRR1032097, SRR1032062, SRR1032061,
SRR1032053, SRR1032052, SRR1032051, SRR1032050, SRR1032049, SRR1032036,
SRR1032035, SRR1030997, SRR1030996, SRR1030995, SRR1030994, SRR1030993,
SRR1030992, SRR1030991, SRR1030990, SRR1030989, SRR1030988, SRR1030987,
SRR1030986, SRR1030985, SRR1030984, SRR1030983, SRR1030982, SRR1030981,
SRR1030980, SRR1030979, SRR1030978, SRR1030977, SRR1030976, SRR1030975,
SRR1030974, SRR1030667, SRR1030352, SRR1030244, SRR1030243, SRR1030242,
SRR1030241, SRR1030240, SRR1030239, SRR1030238, SRR1030237, SRR1030236,
SRR1030235, SRR1030234, SRR1029588, SRR1029587, SRR1029586, SRR1029446,
SRR1029445, SRR1029444, SRR1029443, SRR1029442, SRR1029441, SRR1029440,
SRR1029439, SRR1029438, SRR1029437, SRR1029436, SRR1029435, SRR1029434,

SRR1029433, SRR1029432, SRR1029431, SRR1029430, SRR1029429, SRR1029428,
SRR1029427, SRR1029426, SRR1029425, SRR1029424, SRR1029423, SRR1029422,
SRR1029421, SRR1029420, SRR1029419, SRR1029418, SRR1029417, SRR1029416,
SRR1029415, SRR1029414, SRR1029413, SRR1029412, SRR1029411, SRR1029410,
SRR1029409, SRR1029408, SRR1029407, SRR1029406, SRR1029405, SRR1029404,
SRR1029403, SRR1029402, SRR1029401, SRR1029400, SRR1029399, SRR1029398,
SRR1029397, SRR1029396, SRR1029395, SRR1029394, SRR1029393, SRR1029392,
SRR1029391, SRR1029390, SRR1029389, SRR1029388, SRR1029387, SRR1029386,
SRR1029385, SRR1029384, SRR1029383, SRR1029382, SRR1029381, SRR1029380,
SRR1029379, SRR1029378, SRR1029377, SRR1029376, SRR1029375, SRR1029374,
SRR1029373, SRR1029372, SRR1029371, SRR1029370, SRR1029369, SRR1029368,
SRR1029367, SRR1029366, SRR1029365, SRR1029364, SRR1029363, SRR1029362,
SRR1029361, SRR1029360, SRR1029359, SRR1029358, SRR1029357, SRR1029356,
SRR1029355, SRR1029354, SRR1029353, SRR1029074, SRR1029073, SRR1029072,
SRR1029071, SRR1029053, SRR1029052, SRR1029043, SRR1029042, SRR1029033,
SRR1029032, SRR1029031, SRR1029030, SRR1029029, SRR1029027, SRR1029006,
SRR1029005, SRR1029004, SRR1029003, SRR1029002, SRR1029001, SRR1029000,
SRR1028999, SRR1028998, SRR1028997, SRR1028996, SRR1028995, SRR1028994,
SRR1028993, SRR1028992, SRR1028991, SRR1028990, SRR1028989, SRR1028988,
SRR1028987, SRR1028986, SRR1028985, SRR1028984, SRR1028983, SRR1028982,
SRR1028981, SRR1028980, SRR1028979, SRR1028978, SRR1028977, SRR1028976,
SRR1028975, SRR1028974, SRR1028973, SRR1028972, SRR1028971, SRR1028970,
SRR1028969, SRR1028968, SRR1028967, SRR1028966, SRR1028965, SRR1028964,
SRR1028963, SRR1028962, SRR1028961, SRR1028960, SRR1028959, SRR1028958,
SRR1028957, SRR1028956, SRR1028955, SRR1028954, SRR1028953, SRR1028952,
SRR1028951, SRR1028950, SRR1028949, SRR1028948, SRR1028947, SRR1028946,
SRR1028945, SRR1028866, SRR1028865, SRR1028864, SRR1028863, SRR1028862,
SRR1028861, SRR1028860, SRR1028859, SRR1028858, SRR1028857, SRR1028856,
SRR1028353, SRR1028352, SRR1028351, SRR1028350, SRR1028210, SRR1028209,
SRR1028012, SRR1028011, SRR1027972, SRR1027953, SRR1027949, SRR1027946,
SRR1027943, SRR1027883, SRR1027882, SRR1027881, SRR1027880, SRR1027879,
SRR1027878, SRR1027877, SRR1027876, SRR1027329, SRR1027328, SRR1027327,
SRR1027326, SRR1027325, SRR1027324, SRR1027323, SRR1027322, SRR1027321,
SRR1027320, SRR1027319, SRR1027318, SRR1027317, SRR1027316, SRR1027315,
SRR1027314, SRR1027313, SRR1027312, SRR1027311, SRR1027310, SRR1027309,
SRR1027308, SRR1027307, SRR1027306, SRR1027305, SRR1027304, SRR1027303,
SRR1027302, SRR1027301, SRR1027300, SRR1027299, SRR1027298, SRR1027297,
SRR1027296, SRR1027295, SRR1027294, SRR1027293, SRR1027292, SRR1027291,
SRR1027290, SRR1027289, SRR1027288, SRR1027287, SRR1027286, SRR1027285,
SRR1027284, SRR1027283, SRR1027282, SRR1027281, SRR1027280, SRR1027279,
SRR1027278, SRR1027277, SRR1027276, SRR1027275, SRR1027274, SRR1027273,
SRR1027272, SRR1027271, SRR1027270, SRR1027269, SRR1027268, SRR1027267,

SRR1025281, SRR1025280, SRR1025279, SRR1025278, SRR1025269, SRR1025268,
SRR1025267, SRR1025266, SRR1025265, SRR1025264, SRR1025263, SRR1025262,
SRR1025261, SRR1025260, SRR1025259, SRR1024289, SRR1024288, SRR1024287,
SRR1024286, SRR1024285, SRR1024284, SRR1024283, SRR1024282, SRR1024281,
SRR1024280, SRR1024145, SRR1024108, SRR1024047, SRR1024015, SRR1023824,
SRR1023823, SRR1023822, SRR1023821, SRR1023730, SRR1023265, SRR1023176,
SRR1023109, SRR1023108, SRR1023107, SRR1023106, SRR1023105, SRR1023104,
SRR1023103, SRR1023102, SRR1023101, SRR1023100, SRR1023099, SRR1023098,
SRR1023097, SRR1023096, SRR1023094, SRR1023093, SRR1023092, SRR1023091,
SRR1023090, SRR1023088, SRR1023087, SRR1023086, SRR1023084, SRR1023083,
SRR1022914, SRR1022873, SRR1022872, SRR1022871, SRR1022870, SRR1022496,
SRR1021741, SRR1021568, SRR1021567, SRR1021566, SRR1021565, SRR1020624,
SRR1020623, SRR1020622, SRR1020621, SRR1020591, SRR1020285, SRR1020284,
SRR1020283, SRR1020281, SRR1020275, SRR1020271, SRR1020270, SRR1020269,
SRR1019970, SRR1019857, SRR1019856, SRR1019855, SRR1019854, SRR1019853,
SRR1019733, SRR1019443, SRR1019442, SRR1019441, SRR1019440, SRR1019439,
SRR1019438, SRR1019437, SRR1019436, SRR1019222, SRR1019221, SRR1019210,
SRR1019198, SRR1019197, SRR1019164, SRR1017580, SRR1017579, SRR1017578,
SRR1017577, SRR1017576, SRR1017575, SRR1017574, SRR1017573, SRR1017572,
SRR1017571, SRR1017570, SRR1017569, SRR1017568, SRR1017567, SRR1017566,
SRR1017565, SRR1017564, SRR1017563, SRR1017225, SRR1016733, SRR1016732,
SRR1016731, SRR1016730, SRR1016729, SRR1016728, SRR1016727, SRR1016726,
SRR1016725, SRR1016724, SRR1016723, SRR1016722, SRR1016721, SRR1016720,
SRR1016719, SRR1016718, SRR1016717, SRR1016716, SRR1016715, SRR1016714,
SRR1016713, SRR1016712, SRR1016711, SRR1016710, SRR1016709, SRR1016708,
SRR1016707, SRR1016706, SRR1016705, SRR1016704, SRR1016703, SRR1016702,
SRR1016701, SRR1016700, SRR1016699, SRR1016698, SRR1016697, SRR1016696,
SRR1016695, SRR1016694, SRR1016693, SRR1016692, SRR1016691, SRR1016690,
SRR1016689, SRR1016688, SRR1016687, SRR1016686, SRR1016685, SRR1016684,
SRR1016683, SRR1016682, SRR1016681, SRR1016680, SRR1016679, SRR1016678,
SRR1016677, SRR1016676, SRR1016675, SRR1016674, SRR1016673, SRR1016672,
SRR1016671, SRR1016670, SRR1016669, SRR1016668, SRR1016667, SRR1016666,
SRR1016665, SRR1016664, SRR1016663, SRR1016662, SRR1016661, SRR1016660,
SRR1016659, SRR1016658, SRR1016657, SRR1016656, SRR1016655, SRR1016654,
SRR1016653, SRR1016652, SRR1016651, SRR1016650, SRR1016649, SRR1016648,
SRR1016647, SRR1016646, SRR1016645, SRR1016644, SRR1016643, SRR1016642,
SRR1016641, SRR1016640, SRR1016639, SRR1016638, SRR1016637, SRR1016636,
SRR1016635, SRR1016634, SRR1016633, SRR1016632, SRR1016631, SRR1016630,
SRR1016629, SRR1016628, SRR1016627, SRR1016626, SRR1016225, SRR1016223,
SRR1016220, SRR1016217, SRR1016214, SRR1016213, SRR1016209, SRR1016026,
SRR1015957, SRR1015902, SRR1015859, SRR1015837, SRR1015668, SRR1015667,
SRR1015666, SRR1015665, SRR1015664, SRR1015663, SRR1015662, SRR1015661,

SRR1015660, SRR1015659, SRR1015658, SRR1015657, SRR1015656, SRR1015655, SRR1015654, SRR1015653, SRR1015652, SRR1015651, SRR1015650, SRR1015649, SRR1015648, SRR1015647, SRR1015646, SRR1015645, SRR1015644, SRR1015643, SRR1015642, SRR1015641, SRR1015640, SRR1015639, SRR1015638, SRR1015637, SRR1015636, SRR1015635, SRR1015634, SRR1015633, SRR1015632, SRR1015631, SRR1015630, SRR1015629, SRR1015628, SRR1015627, SRR1015626, SRR1015625, SRR1015624, SRR1015623, SRR1015622, SRR1015548, SRR1015547, SRR1015546, SRR1015545, SRR1015544, SRR1015543, SRR1015542, SRR1015541, SRR1015540, SRR1015539, SRR1015538, SRR1015537, SRR1015471, SRR1015470, SRR1015455, SRR1015454, SRR1015453, SRR1015409, SRR1015408, SRR1015401, SRR1015400, SRR1015399, SRR1015398, SRR1015397, SRR1015396, SRR1015384, SRR1015378, SRR1015377, SRR1015376, SRR1015375, SRR1015374, SRR1015373, SRR1015372, SRR1015371, SRR1015362, SRR1015361, SRR1015360, SRR1015359, SRR1015357, SRR1015356, SRR1015355, SRR1015353, SRR1015352, SRR1015351, SRR1015350, SRR1015348, SRR1015347, SRR1015346, SRR1015345, SRR1015343, SRR1015342, SRR1015341, SRR1015339, SRR1015338, SRR1015337, SRR1015336, SRR1015335, SRR1015334, SRR1015333, SRR1015332, SRR1015330, SRR1015202, SRR1015201, SRR1015200, SRR1015199, SRR1015198, SRR1015197, SRR1015196, SRR1015195, SRR1015194, SRR1015193, SRR1015192, SRR1015191, SRR1015190, SRR1015189, SRR1015188, SRR1015187, SRR1015186, SRR1015185, SRR1015184, SRR1015183, SRR1015182, SRR1015181, SRR1015180, SRR1015179, SRR1015178, SRR1015177, SRR1015176, SRR1015175, SRR1015174, SRR1015173, SRR1015172, SRR1015171, SRR1015170, SRR1015169, SRR1015168, SRR1015167, SRR1015166, SRR1015165, SRR1015164, SRR1015163, SRR1015162, SRR1015161, SRR1015160, SRR1015159, SRR1015158, SRR1015157, SRR1015156, SRR1015155, SRR1015154, SRR1015153, SRR1015152, SRR1015151, SRR1015150, SRR1015149, SRR1015148, SRR1015147, SRR1015146, SRR1015145, SRR1015144, SRR1015143, SRR1015142, SRR1015141, SRR1015140, SRR1015139, SRR1015138, SRR1015137, SRR1015136, SRR1015135, SRR1015134, SRR1015133, SRR1015132, SRR1015131, SRR1015130, SRR1015129, SRR1015128, SRR1015127, SRR1015126, SRR1015125, SRR1015124, SRR1015123, SRR1015122, SRR1015121, SRR1015120, SRR1015119, SRR1015118, SRR1015117, SRR1015116, SRR1015115, SRR1015114, SRR1015113, SRR1015112, SRR1015111, SRR1015110, SRR1015109, SRR1015108, SRR1015107, SRR1015106, SRR1015105, SRR1015104, SRR1015103, SRR1015102, SRR1015101, SRR1015100, SRR1015099, SRR1015098, SRR1015097, SRR1015096, SRR1015095, SRR1015094, SRR1015093, SRR1015092, SRR1015091, SRR1015090, SRR1015089, SRR1015084, SRR1015083, SRR1014729, SRR1013925, SRR1013923, SRR1013922, SRR1013921, SRR1013919, SRR1013918, SRR1013915, SRR1013913, SRR1013912, SRR1013909, SRR1013900, SRR1013899, SRR1013894, SRR1013892, SRR1013891, SRR1013890, SRR1013887, SRR1013886, SRR1013885, SRR1013884, SRR1013882, SRR1013881, SRR1013880, SRR1013878, SRR1013837, SRR1013836, SRR1013833, SRR1013795, SRR1013794, SRR1013793, SRR1013792, SRR1013791, SRR1013790, SRR1013789, SRR1013788,

SRR1013137, SRR1013136, SRR1013135, SRR1013134, SRR1013133, SRR1013132, SRR1013131, SRR1013130, SRR1013129, SRR1013128, SRR1013127, SRR1013126, SRR1013125, SRR1013124, SRR1013123, SRR1013122, SRR1013121, SRR1013120, SRR1013119, SRR1013118, SRR1013117, SRR1013116, SRR1013115, SRR1013114, SRR1013113, SRR1013112, SRR1013111, SRR1013110, SRR1013109, SRR1013108, SRR1013107, SRR1013106, SRR1013105, SRR1013104, SRR1013103, SRR1013102, SRR1013101, SRR1013100, SRR1013099, SRR1013098, SRR1013097, SRR1013096, SRR1013095, SRR1013094, SRR1013093, SRR1013092, SRR1013091, SRR1013090, SRR1013089, SRR1013088, SRR1013087, SRR1013086, SRR1013085, SRR1013084, SRR1013083, SRR1013082, SRR1013081, SRR1013080, SRR1013079, SRR1013078, SRR1013077, SRR1013076, SRR1013075, SRR1013074, SRR1013073, SRR1013072, SRR1013071, SRR1013070, SRR1013069, SRR1013068, SRR1013067, SRR1013066, SRR1013065, SRR1013064, SRR1013063, SRR1013062, SRR1013061, SRR1013060, SRR1013059, SRR1013058, SRR1013057, SRR1013056, SRR1013055, SRR1013054, SRR1013053, SRR1013052, SRR1013051, SRR1013050, SRR1013049, SRR1013048, SRR1013047, SRR1013046, SRR1013045, SRR1013044, SRR1013043, SRR1013042, SRR1013041, SRR1013040, SRR1013039, SRR1013038, SRR1013037, SRR1013036, SRR1013035, SRR1013034, SRR1013033, SRR1012912, SRR1012864, SRR1012863, SRR1012862, SRR1012852, SRR1012850, SRR1012849, SRR1012338, SRR1012337, SRR1011279, SRR1011277, SRR1010847, SRR1010133, SRR1009172, SRR1009171, SRR1006673, SRR1006070, SRR1005923, SRR1005921, SRR1005913, SRR1005909, SRR1005880, SRR1005703, SRR1005702, SRR1005430, SRR1005429, SRR1005428, SRR1005427, SRR1005426, SRR1005425, SRR1005424, SRR1005421, SRR1005420, SRR1005419, SRR1005418, SRR1005417, SRR1005402, SRR1005401, SRR1005400, SRR1005399, SRR1005398, SRR1005397, SRR1005396, SRR1005395, SRR1005394, SRR1005393, SRR1005392, SRR1005391, SRR1005390, SRR1005389, SRR1005388, SRR1005387, SRR1005386, SRR1005385, SRR1005382, SRR1005381, SRR1005380, SRR1005379, SRR1005377, SRR1005376, SRR1005375, SRR1005374, SRR1005372, SRR1005371, SRR1005370, SRR1005369, SRR1005368, SRR1005367, SRR1005366, SRR1005365, SRR1005364, SRR1005363, SRR1005362, SRR1005361, SRR1005360, SRR1005359, SRR1005358, SRR1005357, SRR1005356, SRR1005355, SRR1005354, SRR1005353, SRR1005352, SRR1005351, SRR1005350, SRR1005349, SRR1005348, SRR1005347, SRR1005346, SRR1005345, SRR1005344, SRR1005342, SRR1005341, SRR1005340, SRR1005339, SRR1005338, SRR1005337, SRR1005336, SRR1005335, SRR1005334, SRR1005333, SRR1005332, SRR1005331, SRR1005330, SRR1005329, SRR1005328, SRR1005327, SRR1005326, SRR1005325, SRR1005324, SRR1005322, SRR1005321, SRR1005319, SRR1005316, SRR1005305, SRR1005302, SRR1005295, SRR1005293, SRR1005290, SRR1005288, SRR1005285, SRR1005283, SRR1005282, SRR1005281, SRR1005279, SRR1005278, SRR1005275, SRR1005274, SRR1005272, SRR1005270, SRR1005269, SRR1005264, SRR1005262, SRR1005241, SRR1005240, SRR1005239, SRR1005238, SRR1004975, SRR1004974, SRR1004973, SRR1004972, SRR1004971, SRR1004970, SRR1004969, SRR1004968, SRR1004967, SRR1004966,

SRR1004834, SRR1004833, SRR1004832, SRR1004831, SRR1004830, SRR1004829,
SRR1004791, SRR1004790, SRR1002959, SRR1002958, SRR1002945, SRR1002796,
SRR1002791, SRR1001910, SRR1001909, SRR1001908, SRR1001907, SRR1001906,
SRR1001905, SRR1001904, SRR1001903, SRR1001902, SRR1001901, SRR1001890,
SRR1001889, SRR1001888, SRR1001887, SRR1001886, SRR1001885, SRR1001884,
SRR1001883, SRR1001882, SRR1001881, SRR1001880, SRR1001879, SRR1001878,
SRR1001877, SRR1001876, SRR1001875, SRR1001874, SRR1001634, SRR1001633,
SRR1001632, SRR1001631, SRR1001630, SRR1001629, SRR1001612, SRR1001545,
SRR1001536, SRR1001535, SRR1001532, SRR1001495, SRR1001465, SRR1001442,
SRR1001441, SRR1001440, SRR1001439, SRR1001438, SRR1001437, SRR1001436,
SRR1001435, ERR1370925, ERR1370924, ERR1370923, ERR1370922, ERR1370921,
ERR1370920, ERR1368811, ERR1368810, ERR1368809, ERR1368808, ERR1368807,
ERR1368806, ERR1368805, ERR1368804, ERR1368803, ERR1368802, ERR1368801,
ERR1368800, ERR1368799, ERR1368798, ERR1368797, ERR1368796, ERR1368795,
ERR1368794, ERR1368793, ERR1368792, ERR1368791, ERR1368790, ERR1368789,
ERR1368788, ERR1368787, ERR1368786, ERR1368785, ERR1368784, ERR1368783,
ERR1368782, ERR1368781, ERR1368780, ERR1368779, ERR1368778, ERR1368777,
ERR1368776, ERR1368775, ERR1368774, ERR1368773, ERR1368772, ERR1368771,
ERR1360193, ERR1360191, ERR1360190, ERR1360189, ERR1360187, ERR1360186,
ERR1360185, ERR1360184, ERR1360183, ERR1360182, ERR1360181, ERR1360180,
ERR1360178, ERR1346601, ERR1346600, ERR1346599, ERR1346598, ERR1346597,
ERR1337804, ERR1337803, ERR1337802, ERR1337801, ERR1337800, ERR1337799,
ERR1294260, ERR1292962, ERR1292961, ERR1288710, ERR1288709, ERR1288708,
ERR1288707, ERR1288706, ERR1288705, ERR1288704, ERR1288703, ERR1288702,
ERR1288701, ERR1288700, ERR1288699, ERR1288698, ERR1288697, ERR1288696,
ERR1288695, ERR1288694, ERR1288693, ERR1288692, ERR1288691, ERR1288690,
ERR1288689, ERR1288688, ERR1288687, ERR1288686, ERR1288685, ERR1288684,
ERR1288683, ERR1288682, ERR1278117, ERR1278116, ERR1278115, ERR1278114,
ERR1278113, ERR1254239, ERR1254238, ERR1254237, ERR1254236, ERR1230132,
ERR1230131, ERR1230130, ERR1230129, ERR1230128, ERR1230127, ERR1201263,
ERR1201262, ERR1198111, ERR1198110, ERR1198109, ERR1198108, ERR1198107,
ERR1198106, ERR1198105, ERR1198104, ERR1198103, ERR1198102, ERR1198101,
ERR1198100, ERR1198099, ERR1198098, ERR1198097, ERR1198096, ERR1198095,
ERR1198094, ERR1198093, ERR1198092, ERR1198091, ERR1198090, ERR1198089,
ERR1198088, ERR1194865, ERR1194864, ERR1194863, ERR1194862, ERR1194861,
ERR1194860, ERR1194859, ERR1194858, ERR1194857, ERR1194856, ERR1194855,
ERR1194854, ERR1194853, ERR1194852, ERR1194851, ERR1194850, ERR1194849,
ERR1194848, ERR1194847, ERR1194846, ERR1194845, ERR1194844, ERR1194843,
ERR1194842, ERR1194841, ERR1194840, ERR1194839, ERR1194838, ERR1194837,
ERR1194836, ERR1194835, ERR1194834, ERR1194833, ERR1194832, ERR1194831,
ERR1194830, ERR1194829, ERR1194828, ERR1194827, ERR1194826, ERR1194825,
ERR1194824, ERR1194823, ERR1194822, ERR1194821, ERR1194820, ERR1194819,

ERR1194818, ERR1191032, ERR1191031, ERR1191030, ERR1191029, ERR1189574,
ERR1189573, ERR1189541, ERR1146955, ERR1146954, ERR1146953, ERR1146952,
ERR1146951, ERR1146950, ERR1142067, ERR1142066, ERR1142065, ERR1142064,
ERR1142063, ERR1142062, ERR1142061, ERR1142060, ERR1142059, ERR1142058,
ERR1142057, ERR1142056, ERR1142055, ERR1142054, ERR1142053, ERR1142052,
ERR1142051, ERR1142050, ERR1142049, ERR1142048, ERR1142047, ERR1142046,
ERR1142045, ERR1142044, ERR1142043, ERR1142042, ERR1142041, ERR1141970,
ERR1141969, ERR1141968, ERR1141967, ERR1141966, ERR1141965, ERR1141964,
ERR1141963, ERR1141962, ERR1141961, ERR1141960, ERR1141959, ERR1141923,
ERR1141922, ERR1141921, ERR1141920, ERR1141919, ERR1141918, ERR1141843,
ERR1141842, ERR1109880, ERR1109879, ERR1109878, ERR1109877, ERR1109876,
ERR1109875, ERR1104428, ERR1104427, ERR1104426, ERR1104425, ERR1104424,
ERR1104423, ERR1104422, ERR1104421, ERR1104420, ERR1104419, ERR1104418,
ERR1104417, ERR1104416, ERR1104415, ERR1104414, ERR1104412, ERR1104411,
ERR1104410, ERR1104409, ERR1104408, ERR1104407, ERR1104406, ERR1104405,
ERR1104404, ERR1104403, ERR1104402, ERR1104401, ERR1104400, ERR1104399,
ERR1104398, ERR1104397, ERR1104396, ERR1104395, ERR1104394, ERR1104393,
ERR1104392, ERR1104391, ERR1104390, ERR1104389, ERR1104388, ERR1104387,
ERR1104386, ERR1104385, ERR1104384, ERR1104383, ERR1104382, ERR1104381,
ERR1104380, ERR1104379, ERR1104378, ERR1104377, ERR1104376, ERR1104375,
ERR1104374, ERR1104373, ERR1104372, ERR1104371, ERR1104370, ERR1104369,
ERR1100845, ERR1100844, ERR1100843, ERR1100842, ERR1100841, ERR1100840,
ERR1100839, ERR1100838, ERR1100837, ERR1100836, ERR1077803, ERR1077802,
ERR1077801, ERR1077800, ERR1077799, ERR1077798, ERR1077797, ERR1077796,
ERR1077795, ERR1077794, ERR1077793, ERR1077792, ERR1077791, ERR1077790,
ERR1077789, ERR1075430, ERR1075429, ERR1075428, ERR1072623, ERR1072622,
ERR1072621, ERR1072620, ERR1072563, ERR1072562, ERR1072561, ERR1072560,
ERR1072559, ERR1072558, ERR1072557, ERR1072556, ERR1072555, ERR1072554,
ERR1072553, ERR1072552, ERR1072551, ERR1072550, ERR1072549, ERR1059523,
ERR1059522, ERR1059521, ERR1059520, ERR1059519, ERR1059485, ERR1059484,
ERR1059483, ERR1059482, ERR1059481, ERR1059480, ERR1059479, ERR1059478,
ERR1059477, ERR1059476, ERR1059475, ERR1059474, ERR1059473, ERR1059472,
ERR1059471, ERR1059470, ERR1059469, ERR1059468, ERR1059467, ERR1059466,
ERR1059465, ERR1059464, ERR1059463, ERR1059462, ERR1059461, ERR1059460,
ERR1059459, ERR1059458, ERR1059457, ERR1059456, ERR1059455, ERR1059454,
ERR1059453, ERR1059452, ERR1059451, ERR1059450, ERR1059449, ERR1059448,
ERR1059447, ERR1059446, ERR1059445, ERR1059444, ERR1059443, ERR1059442,
ERR1059441, ERR1059440, ERR1059439, ERR1059438, ERR1059437, ERR1059436,
ERR1059435, ERR1059434, ERR1059433, ERR1059432, ERR1059431, ERR1059430,
ERR1059429, ERR1059428, ERR1059427, ERR1059426, ERR1059425, ERR1059424,
ERR1059423, ERR1059422, ERR1059421, ERR1059420, ERR1059419, ERR1059418,
ERR1059417, ERR1059416, ERR1059415, ERR1059414, ERR1059413, ERR1059412,

ERR1059411, ERR1059410, ERR1059409, ERR1059408, ERR1059407, ERR1059406,
ERR1059405, ERR1059404, ERR1059403, ERR1059402, ERR1059401, ERR1059400,
ERR1059399, ERR1059398, ERR1059397, ERR1059396, ERR1059395, ERR1059394,
ERR1059393, ERR1059392, ERR1059391, ERR1059390, ERR1059389, ERR1059388,
ERR1059387, ERR1059377, ERR1059376, ERR1059375, ERR1059374, ERR1059373,
ERR1059372, ERR1025477, ERR1025476, ERR1025475, ERR1025474, ERR1025473,
ERR1025472, ERR1025471, ERR1025470, ERR1025469, ERR1025468, ERR1025467,
ERR1025466, ERR1025465, ERR1025464, ERR1025463, ERR1025462, ERR1025461,
ERR1025460, ERR1025459, ERR1025458, ERR1025457, ERR1025456, ERR1025455,
ERR1025454, ERR1025453, ERR1025452, ERR1025451, ERR1025450, ERR1025449,
ERR1025448, ERR1025447, ERR1025446, ERR1025445, ERR1025444, ERR1025443,
ERR1018112, ERR1018111, ERR1018110, ERR1018109, ERR1018108, ERR1018107,
ERR1017197, ERR1017196, ERR1017195, ERR1017194, ERR1017193, ERR1017192,
ERR1017191, ERR1017190, ERR1017189, ERR1017188, ERR1007369, ERR1007368,
ERR1007367, ERR1007366, ERR1007365, ERR1007364, ERR1000674, ERR1000673,
ERR1000672, ERR1000671, ERR1000670, ERR1000669, ERR1000668, ERR1000667,
ERR1000666, ERR1000665, ERR1000664, ERR1000663, ERR1000662, ERR1000661,
ERR1000660, ERR1000659, ERR1000658, ERR1000657, ERR1000656, ERR1000655,
ERR1000654, ERR1000653, ERR1000652, ERR1000651, ERR1000650, ERR1000649,
ERR1000648, ERR1000647, ERR1000646, ERR1000645, ERR1000644, ERR1000643,
ERR1000642, ERR1000641, ERR1000640, ERR1000639, SRR999432, SRR999317,
SRR999316, SRR999315, SRR999314, SRR999313, SRR999312, SRR999311, SRR999310,
SRR999309, SRR999308, SRR999307, SRR999306, SRR999305, SRR999304, SRR999303,
SRR999302, SRR999301, SRR999300, SRR999299, SRR999298, SRR999297, SRR999296,
SRR999295, SRR999292, SRR999290, SRR999289, SRR999288, SRR999287, SRR999286,
SRR999285, SRR999284, SRR999283, SRR999282, SRR999275, SRR999063, SRR999062,
SRR999061, SRR999060, SRR999059, SRR999058, SRR999057, SRR999056, SRR999055,
SRR999054, SRR999053, SRR999052, SRR999051, SRR999050, SRR999049, SRR999048,
SRR999047, SRR999046, SRR999045, SRR999044, SRR999043, SRR999042, SRR999041,
SRR999040, SRR999039, SRR999038, SRR999037, SRR999036, SRR999035, SRR999034,
SRR999033, SRR999032, SRR998927, SRR998853, SRR998808, SRR998575, SRR998547,
SRR994403, SRR994402, SRR994401, SRR994400, SRR994396, SRR994131, SRR993743,
SRR993740, SRR988701, SRR988700, SRR988699, SRR988698, SRR988682, SRR988681,
SRR988680, SRR988677, SRR988676, SRR988675, SRR988673, SRR988550, SRR988549,
SRR988540, SRR988535, SRR988534, SRR988533, SRR988532, SRR988531, SRR988530,
SRR988529, SRR988523, SRR988461, SRR988460, SRR988459, SRR988458, SRR988457,
SRR988456, SRR988418, SRR988278, SRR988248, SRR988247, SRR988246, SRR988109,
SRR988108, SRR988022, SRR988021, SRR988020, SRR988019, SRR988018, SRR988017,
SRR988016, SRR988015, SRR988013, SRR988012, SRR988011, SRR988010, SRR987987,
SRR987953, SRR987952, SRR987951, SRR987949, SRR987648, SRR987333, SRR987330,
SRR987329, SRR986200, SRR986199, SRR986114, SRR985919, SRR985300, SRR985299,
SRR985033, SRR984687, SRR984587, SRR984539, SRR984258, SRR984257, SRR984256,

SRR984255, SRR984002, SRR983807, SRR980629, SRR980321, SRR978813, SRR978416, SRR978415, SRR978414, SRR978413, SRR978411, SRR978410, SRR978409, SRR978408, SRR976398, SRR976397, SRR976396, SRR976395, SRR976394, SRR976393, SRR976392, SRR976391, SRR976390, SRR976389, SRR976388, SRR976343, SRR976342, SRR976341, SRR976340, SRR976339, SRR976338, SRR976337, SRR976336, SRR976335, SRR976173, SRR976172, SRR976171, SRR976170, SRR976169, SRR976168, SRR976165, SRR976164, SRR976163, SRR976162, SRR976161, SRR976160, SRR976159, SRR976158, SRR975546, SRR975545, SRR975544, SRR975543, SRR975539, SRR975538, SRR975489, SRR975488, SRR975487, SRR975486, SRR975484, SRR975478, SRR975359, SRR975135, SRR975134, SRR975133, SRR975132, SRR975131, SRR975130, SRR975129, SRR975128, SRR975127, SRR975126, SRR975125, SRR975124, SRR975123, SRR975122, SRR975121, SRR975120, SRR975119, SRR975118, SRR975117, SRR975116, SRR975115, SRR975114, SRR975113, SRR975112, SRR975111, SRR975110, SRR975109, SRR975108, SRR975107, SRR975106, SRR975105, SRR975104, SRR975103, SRR975102, SRR975101, SRR975100, SRR975099, SRR975098, SRR975097, SRR975096, SRR975095, SRR975094, SRR975093, SRR975092, SRR975091, SRR975090, SRR975089, SRR975088, SRR975087, SRR975086, SRR975085, SRR975084, SRR975083, SRR975082, SRR975081, SRR975080, SRR975079, SRR975078, SRR975077, SRR975076, SRR975075, SRR975074, SRR975073, SRR975072, SRR974967, SRR974966, SRR974965, SRR974964, SRR974963, SRR974945, SRR974941, SRR974940, SRR974939, SRR974938, SRR974916, SRR974909, SRR974908, SRR974907, SRR974906, SRR974905, SRR974904, SRR974903, SRR974902, SRR974901, SRR974900, SRR974899, SRR974898, SRR974897, SRR974896, SRR974895, SRR974894, SRR974753, SRR974752, SRR974751, SRR974750, SRR971778, SRR971646, SRR971581, SRR971578, SRR971502, SRR971249, SRR971248, SRR971246, SRR971245, SRR971244, SRR971243, SRR971148, SRR970149, SRR969471, SRR969418, SRR967633, SRR967291, SRR967289, SRR967288, SRR967287, SRR967286, SRR967285, SRR967284, SRR967283, SRR967282, SRR967281, SRR967280, SRR967279, SRR967278, SRR967277, SRR967276, SRR967275, SRR967190, SRR967189, SRR967188, SRR967187, SRR967186, SRR967185, SRR967184, SRR967183, SRR967182, SRR967181, SRR967164, SRR967154, SRR966622, SRR966621, SRR966620, SRR966619, SRR966549, SRR966542, SRR966513, SRR966485, SRR966484, SRR966483, SRR966482, SRR966481, SRR966480, SRR966479, SRR966478, SRR966477, SRR966476, SRR966475, SRR966474, SRR966473, SRR966472, SRR966412, SRR966405, SRR966236, SRR965963, SRR965929, SRR964825, SRR963796, SRR963795, SRR963794, SRR963469, SRR962480, SRR962479, SRR962478, SRR962477, SRR962476, SRR962475, SRR962474, SRR962473, SRR962472, SRR962471, SRR961925, SRR961924, SRR961052, SRR961051, SRR961050, SRR961049, SRR961047, SRR961046, SRR961045, SRR961044, SRR960430, SRR960429, SRR960424, SRR960422, SRR960421, SRR960420, SRR960418, SRR960417, SRR960405, SRR960404, SRR960389, SRR960387, SRR960272, SRR960269, SRR960255, SRR960248, SRR960247, SRR960245, SRR960244, SRR960243, SRR960242, SRR960241, SRR960240, SRR960239, SRR960238, SRR960237, SRR960236, SRR960235, SRR960234, SRR960233, SRR960232, SRR960231, SRR960230, SRR960229, SRR960228, SRR960227, SRR960226, SRR960225, SRR960224, SRR960223, SRR960222, SRR960221, SRR960220,

SRR960219, SRR960218, SRR960217, SRR960216, SRR960215, SRR960214, SRR960213, SRR960212, SRR960183, SRR960179, SRR960151, SRR960147, SRR960146, SRR960145, SRR960144, SRR960143, SRR960130, SRR960129, SRR959899, SRR959890, SRR959857, SRR959856, SRR959801, SRR959800, SRR959799, SRR959798, SRR959797, SRR959796, SRR959795, SRR959794, SRR959793, SRR959792, SRR959791, SRR959790, SRR959789, SRR959788, SRR959787, SRR959786, SRR959785, SRR959784, SRR959783, SRR959782, SRR959781, SRR959780, SRR959779, SRR959778, SRR959777, SRR959776, SRR959775, SRR959774, SRR959773, SRR959772, SRR959771, SRR959770, SRR959769, SRR959768, SRR959767, SRR959766, SRR959765, SRR959750, SRR959591, SRR959590, SRR959586, SRR959585, SRR959503, SRR959290, SRR958847, SRR958846, SRR958841, SRR958819, SRR958803, SRR958742, SRR958525, SRR958473, SRR958472, SRR958469, SRR957672, SRR957671, SRR957670, SRR957669, SRR957668, SRR957667, SRR957666, SRR957665, SRR957664, SRR957663, SRR957662, SRR957661, SRR957660, SRR957659, SRR957658, SRR957657, SRR957228, SRR956946, SRR956808, SRR956426, SRR956021, SRR955788, SRR955787, SRR955786, SRR955785, SRR955784, SRR955783, SRR955778, SRR955777, SRR955776, SRR955774, SRR955773, SRR955772, SRR955767, SRR955766, SRR955765, SRR955763, SRR955762, SRR955761, SRR955710, SRR955709, SRR955456, SRR955455, SRR955454, SRR955453, SRR955452, SRR955451, SRR955450, SRR955449, SRR955448, SRR955447, SRR955446, SRR955445, SRR955444, SRR955406, SRR955314, SRR955313, SRR955312, SRR955302, SRR955301, SRR955300, SRR954983, SRR954944, SRR954898, SRR954897, SRR954896, SRR954894, SRR954881, SRR954880, SRR954879, SRR954862, SRR954861, SRR953755, SRR953481, SRR953478, SRR953401, SRR953400, SRR953399, SRR953376, SRR953375, SRR953374, SRR953373, SRR953372, SRR953371, SRR953370, SRR953369, SRR953329, SRR953245, SRR953244, SRR953243, SRR953242, SRR953082, SRR953081, SRR953080, SRR953079, SRR953078, SRR953077, SRR953034, SRR953033, SRR953032, SRR953031, SRR953030, SRR953029, SRR953028, SRR953027, SRR952905, SRR952903, SRR952902, SRR952901, SRR952900, SRR952899, SRR952898, SRR952897, SRR952896, SRR952895, SRR952894, SRR952893, SRR952892, SRR952891, SRR952890, SRR952889, SRR952888, SRR952887, SRR952886, SRR952754, SRR952753, SRR952752, SRR952751, SRR952750, SRR952749, SRR952748, SRR952747, SRR952746, SRR952745, SRR952744, SRR952743, SRR952742, SRR952741, SRR952740, SRR952739, SRR952737, SRR952736, SRR952735, SRR952734, SRR952733, SRR952732, SRR952731, SRR952730, SRR952729, SRR952728, SRR952726, SRR952725, SRR952724, SRR952723, SRR952722, SRR952721, SRR952720, SRR952719, SRR952716, SRR952715, SRR952714, SRR952713, SRR952712, SRR952711, SRR952710, SRR952709, SRR952708, SRR952707, SRR952706, SRR952705, SRR952704, SRR952703, SRR952702, SRR952701, SRR952700, SRR952685, SRR952328, SRR952327, SRR952321, SRR952308, SRR952242, SRR950973, SRR950672, SRR950671, SRR950670, SRR950669, SRR950441, SRR950400, SRR950399, SRR950398, SRR950397, SRR950390, SRR950186, SRR950185, SRR950184, SRR950183, SRR950182, SRR950181, SRR950164, SRR950163, SRR950162, SRR950111, SRR950110, SRR950105, SRR950104, SRR950103, SRR950102, SRR950101, SRR950100, SRR950099, SRR950098, SRR950097, SRR950096, SRR950095, SRR950094, SRR950091, SRR950089, SRR949993,

SRR949992, SRR949991, SRR949990, SRR949989, SRR949988, SRR949973, SRR949972, SRR949971, SRR949970, SRR949969, SRR949968, SRR949967, SRR949966, SRR949965, SRR949956, SRR949823, SRR949822, SRR949820, SRR949614, SRR949600, SRR949599, SRR949598, SRR949269, SRR949268, SRR949267, SRR949266, SRR949265, SRR949264, SRR949263, SRR949262, SRR949261, SRR949260, SRR949259, SRR949258, SRR949256, SRR949255, SRR949254, SRR949253, SRR949252, SRR949251, SRR949250, SRR949249, SRR949248, SRR949247, SRR949246, SRR949245, SRR949244, SRR949243, SRR949242, SRR949241, SRR949240, SRR949239, SRR949238, SRR949237, SRR949236, SRR949235, SRR949234, SRR949233, SRR949232, SRR949231, SRR949230, SRR949229, SRR949228, SRR949227, SRR949073, SRR949072, SRR949071, SRR949070, SRR949069, SRR949068, SRR949067, SRR949066, SRR949065, SRR949064, SRR949063, SRR949062, SRR949057, SRR948857, SRR948834, SRR948833, SRR948832, SRR948830, SRR948826, SRR948733, SRR948732, SRR948731, SRR948730, SRR948729, SRR948728, SRR948727, SRR948726, SRR948725, SRR948724, SRR948546, SRR948545, SRR948489, SRR948488, SRR948487, SRR948486, SRR948485, SRR948484, SRR948483, SRR948482, SRR948481, SRR948479, SRR948478, SRR948477, SRR948475, SRR948474, SRR948473, SRR948472, SRR948471, SRR948470, SRR948469, SRR948468, SRR948467, SRR948466, SRR948465, SRR948464, SRR948463, SRR948462, SRR948461, SRR948460, SRR948302, SRR948301, SRR948300, SRR948299, SRR948161, SRR948154, SRR947850, SRR947849, SRR947848, SRR947847, SRR947846, SRR947845, SRR947844, SRR947843, SRR947842, SRR947841, SRR947840, SRR947839, SRR947838, SRR947837, SRR947836, SRR947834, SRR947832, SRR947831, SRR947830, SRR947829, SRR947828, SRR947827, SRR947826, SRR947825, SRR947824, SRR947822, SRR947820, SRR947818, SRR947816, SRR947814, SRR947812, SRR947811, SRR947810, SRR947808, SRR947807, SRR947806, SRR947804, SRR947803, SRR947802, SRR947801, SRR947800, SRR947798, SRR947797, SRR947794, SRR947792, SRR947791, SRR947790, SRR947789, SRR947788, SRR947787, SRR947786, SRR947785, SRR947784, SRR947783, SRR947782, SRR947781, SRR947780, SRR947779, SRR947778, SRR947777, SRR947776, SRR947775, SRR947774, SRR947773, SRR947772, SRR947771, SRR947770, SRR947769, SRR947768, SRR947767, SRR947766, SRR947765, SRR947764, SRR947763, SRR947762, SRR947761, SRR947760, SRR947759, SRR947758, SRR947757, SRR947756, SRR947755, SRR947754, SRR947753, SRR947752, SRR947751, SRR947750, SRR947749, SRR947748, SRR947746, SRR947065, SRR947064, SRR947047, SRR947046, SRR947045, SRR947044, SRR947043, SRR947042, SRR947041, SRR947040, SRR947039, SRR947038, SRR947037, SRR947036, SRR947030, SRR947028, SRR947026, SRR947024, SRR947023, SRR947022, SRR947021, SRR947020, SRR947019, SRR947018, SRR947017, SRR947016, SRR947015, SRR947014, SRR947006, SRR947005, SRR946984, SRR946983, SRR946982, SRR946968, SRR946965, SRR946951, SRR946950, SRR946949, SRR946948, SRR946865, SRR946864, SRR946863, SRR946529, SRR946460, SRR946459, SRR946458, SRR946457, SRR946456, SRR946455, SRR946454, SRR946453, SRR946021, SRR946020, SRR946019, SRR946018, SRR946017, SRR946016, SRR945765, SRR945597, SRR945592, SRR945451, SRR945446, SRR945445, SRR945444, SRR945443, SRR944677, SRR944642, SRR944600, SRR944599, SRR944598, SRR944597, SRR944596, SRR944371, SRR944370, SRR944369,

SRR944368, SRR944367, SRR944366, SRR944365, SRR944364, SRR944363, SRR944362, SRR943869, SRR943830, SRR943829, SRR943828, SRR943827, SRR943826, SRR943825, SRR943824, SRR943823, SRR943822, SRR943821, SRR943820, SRR943819, SRR943818, SRR943817, SRR943816, SRR943815, SRR943814, SRR943813, SRR943773, SRR943772, SRR943771, SRR943770, SRR943769, SRR943768, SRR943057, SRR943056, SRR943055, SRR943054, SRR943053, SRR943052, SRR943051, SRR943050, SRR943049, SRR943048, SRR943047, SRR943046, SRR943045, SRR943044, SRR943043, SRR943042, SRR943041, SRR943040, SRR943039, SRR943038, SRR943037, SRR943036, SRR943035, SRR943034, SRR942918, SRR942917, SRR942916, SRR942915, SRR942914, SRR942913, SRR942912, SRR942911, SRR942910, SRR942909, SRR942907, SRR942905, SRR942903, SRR942900, SRR942898, SRR942897, SRR942895, SRR942893, SRR942891, SRR942888, SRR942883, SRR942882, SRR942867, SRR942866, SRR942865, SRR942864, SRR942848, SRR942847, SRR942846, SRR942845, SRR942841, SRR942839, SRR942838, SRR942836, SRR942835, SRR942834, SRR942833, SRR942832, SRR942831, SRR942830, SRR942829, SRR942827, SRR942826, SRR942825, SRR942824, SRR942823, SRR942822, SRR942821, SRR942820, SRR942817, SRR942816, SRR942815, SRR942814, SRR942813, SRR942812, SRR942811, SRR942810, SRR942808, SRR942807, SRR942806, SRR942637, SRR942636, SRR942635, SRR942523, SRR942522, SRR942521, SRR942520, SRR942519, SRR942518, SRR942391, SRR942079, SRR942078, SRR942077, SRR942076, SRR942075, SRR942074, SRR942073, SRR942072, SRR942071, SRR942070, SRR942069, SRR942068, SRR942033, SRR942032, SRR942031, SRR942030, SRR942029, SRR942028, SRR942027, SRR942026, SRR942025, SRR942024, SRR942023, SRR942022, SRR941807, SRR941806, SRR941805, SRR941804, SRR941803, SRR941802, SRR941801, SRR941800, SRR941799, SRR941798, SRR941797, SRR941796, SRR941795, SRR941794, SRR941793, SRR941792, SRR941791, SRR941790, SRR941789, SRR941788, SRR941787, SRR941722, SRR941721, SRR941717, SRR941310, SRR941309, SRR941266, SRR941265, SRR941264, SRR941262, SRR941257, SRR941256, SRR941255, SRR941254, SRR941253, SRR941252, SRR940300, SRR940299, SRR940298, SRR940297, SRR940296, SRR940295, SRR940294, SRR940293, SRR940292, SRR940291, SRR940290, SRR940289, SRR940287, SRR940286, SRR940284, SRR940283, SRR940281, SRR940280, SRR940279, SRR940278, SRR940276, SRR940274, SRR940260, SRR940259, SRR940257, SRR940256, SRR940255, SRR940254, SRR940253, SRR940252, SRR940251, SRR940250, SRR940249, SRR940239, SRR940238, SRR940237, SRR935853, SRR935852, SRR935851, SRR935850, SRR935849, SRR935848, SRR935847, SRR935846, SRR935845, SRR935844, SRR935843, SRR935817, SRR935510, SRR935498, SRR935488, SRR935438, SRR935437, SRR935385, SRR935383, SRR935382, SRR935380, SRR935378, SRR935377, SRR935373, SRR935372, SRR935371, SRR935370, SRR935369, SRR935368, SRR935365, SRR935362, SRR935333, SRR935203, SRR935077, SRR935076, SRR935075, SRR935017, SRR935016, SRR935015, SRR935014, SRR935013, SRR934446, SRR934445, SRR934444, SRR934443, SRR934442, SRR934441, SRR934440, SRR934439, SRR934438, SRR934392, SRR934391, SRR934064, SRR934034, SRR934033, SRR934032, SRR934031, SRR934030, SRR934029, SRR933770, SRR933769, SRR933557, SRR933556, SRR933552, SRR933551, SRR932114, SRR932113, SRR932112, SRR932111, SRR931849, SRR931848, SRR931847,

SRR931840, SRR931839, SRR931835, SRR931834, SRR931833, SRR931832, SRR931792, SRR931791, SRR931790, SRR931789, SRR931769, SRR931768, SRR929434, SRR929433, SRR929432, SRR929431, SRR929430, SRR929429, SRR929428, SRR929427, SRR929426, SRR929184, SRR929127, SRR929003, SRR929002, SRR929001, SRR929000, SRR928708, SRR928707, SRR928613, SRR928247, SRR927460, SRR927346, SRR927345, SRR927344, SRR927343, SRR927342, SRR927341, SRR927340, SRR927338, SRR927163, SRR926848, SRR926847, SRR926770, SRR926581, SRR926580, SRR926579, SRR926578, SRR926577, SRR926576, SRR926575, SRR926574, SRR926573, SRR926289, SRR926288, SRR926287, SRR926286, SRR926285, SRR926284, SRR926283, SRR926282, SRR926251, SRR926250, SRR926249, SRR926247, SRR926246, SRR926245, SRR926244, SRR926218, SRR926217, SRR926216, SRR926215, SRR926214, SRR926213, SRR926212, SRR926211, SRR926209, SRR926208, SRR926206, SRR926205, SRR926204, SRR926202, SRR926201, SRR926200, SRR926197, SRR926195, SRR926191, SRR926190, SRR926189, SRR926188, SRR926187, SRR926185, SRR926182, SRR926178, SRR926177, SRR926176, SRR926175, SRR926174, SRR926173, SRR926172, SRR926171, SRR926170, SRR926169, SRR926002, SRR926001, SRR926000, SRR925873, SRR925872, SRR925871, SRR925870, SRR925869, SRR925868, SRR925867, SRR925866, SRR925865, SRR925864, SRR925863, SRR925862, SRR925860, SRR925859, SRR925858, SRR925856, SRR925855, SRR925854, SRR925853, SRR925851, SRR925850, SRR925849, SRR925848, SRR925847, SRR925846, SRR925845, SRR925844, SRR925843, SRR925842, SRR925841, SRR925840, SRR925839, SRR925838, SRR925837, SRR925836, SRR925835, SRR925834, SRR925833, SRR925832, SRR925831, SRR925830, SRR925686, SRR925468, SRR925467, SRR925466, SRR925465, SRR925464, SRR925463, SRR925391, SRR924691, SRR924690, SRR924689, SRR924687, SRR924686, SRR924685, SRR924684, SRR924662, SRR924661, SRR924660, SRR924659, SRR924658, SRR924656, SRR924352, SRR924350, SRR924349, SRR924347, SRR924343, SRR924324, SRR924322, SRR924313, SRR924285, SRR924284, SRR924283, SRR924282, SRR924281, SRR924280, SRR924279, SRR924278, SRR924277, SRR924276, SRR924275, SRR924274, SRR924273, SRR924272, SRR924271, SRR924270, SRR924269, SRR924268, SRR924267, SRR924266, SRR924265, SRR924264, SRR924263, SRR924195, SRR924194, SRR924193, SRR924192, SRR924191, SRR924149, SRR924148, SRR924147, SRR924144, SRR924142, SRR924114, SRR924112, SRR924110, SRR924108, SRR924107, SRR924102, SRR924101, SRR924099, SRR924098, SRR924095, SRR924094, SRR924092, SRR924091, SRR924090, SRR924089, SRR924083, SRR924080, SRR924079, SRR924078, SRR924077, SRR924076, SRR924075, SRR924074, SRR924073, SRR924072, SRR924071, SRR924070, SRR924069, SRR923904, SRR923903, SRR923901, SRR923900, SRR923899, SRR923898, SRR923897, SRR923896, SRR923894, SRR923893, SRR923892, SRR923891, SRR923890, SRR923889, SRR923887, SRR923886, SRR923885, SRR923882, SRR923858, SRR923817, SRR923816, SRR923813, SRR923811, SRR922465, SRR922436, SRR922417, SRR922416, SRR922411, SRR922244, SRR922243, SRR922242, SRR922241, SRR922240, SRR922239, SRR922238, SRR922231, SRR922230, SRR922229, SRR922228, SRR922227, SRR922226, SRR922225, SRR922224, SRR922138, SRR922137, SRR922136, SRR922126, SRR922097, SRR922004, SRR921507, SRR921429, SRR921428, SRR921427, SRR921426, SRR921425, SRR921424, SRR921423,

SRR921422, SRR921421, SRR921420, SRR921419, SRR921418, SRR921417, SRR921416, SRR921415, SRR921414, SRR921413, SRR921412, SRR921411, SRR921410, SRR921409, SRR921408, SRR921407, SRR921406, SRR921405, SRR921404, SRR921403, SRR921402, SRR921401, SRR921400, SRR921399, SRR921398, SRR921397, SRR921396, SRR921395, SRR921394, SRR921393, SRR921392, SRR921391, SRR921390, SRR921389, SRR921388, SRR921387, SRR921386, SRR921346, SRR921345, SRR921344, SRR921342, SRR921341, SRR921340, SRR921338, SRR921337, SRR921336, SRR921329, SRR921328, SRR921327, SRR921326, SRR921324, SRR921322, SRR921321, SRR921318, SRR921317, SRR921316, SRR921315, SRR921314, SRR921313, SRR921312, SRR921311, SRR919336, SRR919335, SRR919334, SRR919299, SRR919298, SRR917965, SRR917964, SRR917963, SRR917962, SRR917954, SRR917953, SRR917952, SRR917951, SRR916887, SRR916886, SRR916839, SRR916186, SRR916185, SRR916184, SRR916183, SRR916156, SRR916135, SRR916133, SRR916132, SRR916003, SRR915982, SRR915926, SRR915925, SRR915924, SRR915258, SRR915106, SRR914910, SRR914780, SRR914523, SRR914444, SRR914251, SRR913041, SRR913040, SRR913016, SRR913015, SRR913014, SRR913009, SRR913008, SRR913006, SRR912987, SRR912986, SRR912985, SRR912984, SRR912983, SRR912966, SRR912965, SRR912964, SRR912963, SRR912960, SRR912958, SRR912954, SRR912952, SRR912893, SRR912892, SRR912891, SRR912889, SRR912888, SRR912887, SRR912882, SRR912881, SRR912879, SRR912878, SRR912877, SRR912876, SRR912875, SRR912856, SRR912855, SRR912854, SRR912853, SRR912852, SRR912851, SRR912850, SRR912849, SRR912848, SRR912827, SRR912826, SRR912825, SRR912824, SRR912823, SRR912822, SRR912821, SRR912800, SRR912796, SRR912795, SRR912789, SRR912788, SRR912787, SRR912786, SRR912785, SRR912784, SRR912783, SRR912782, SRR912761, SRR912760, SRR912755, SRR912754, SRR912753, SRR912752, SRR912751, SRR912750, SRR912749, SRR912748, SRR912747, SRR912746, SRR912745, SRR912744, SRR912743, SRR912742, SRR912741, SRR912682, SRR912681, SRR912680, SRR912679, SRR912678, SRR912677, SRR912676, SRR912675, SRR912674, SRR912672, SRR912671, SRR912644, SRR912643, SRR912642, SRR912641, SRR912639, SRR912638, SRR912637, SRR912636, SRR912635, SRR912634, SRR912632, SRR912631, SRR912630, SRR912602, SRR912601, SRR912599, SRR912598, SRR912576, SRR912575, SRR912574, SRR912573, SRR912572, SRR912571, SRR912570, SRR912569, SRR912567, SRR912543, SRR912542, SRR912540, SRR912539, SRR912538, SRR912537, SRR912532, SRR912531, SRR912514, SRR912468, SRR912467, SRR912466, SRR912464, SRR912463, SRR912462, SRR912461, SRR912460, SRR912458, SRR912457, SRR912456, SRR912435, SRR912434, SRR912433, SRR912432, SRR912431, SRR912430, SRR912429, SRR912428, SRR912404, SRR912403, SRR912402, SRR912401, SRR912400, SRR912399, SRR912398, SRR912397, SRR912396, SRR912395, SRR912394, SRR912367, SRR912366, SRR912365, SRR912364, SRR912358, SRR912357, SRR912336, SRR912335, SRR912334, SRR912333, SRR912332, SRR912331, SRR912330, SRR912329, SRR912328, SRR912301, SRR912300, SRR912299, SRR912298, SRR912297, SRR912296, SRR912287, SRR912267, SRR912266, SRR912265, SRR912238, SRR912236, SRR912224, SRR912165, SRR912164, SRR912163, SRR912162, SRR912161, SRR912160, SRR912159, SRR912138, SRR912137, SRR912136, SRR912135, SRR912134, SRR912107, SRR912106, SRR912104,

SRR912103, SRR912102, SRR912101, SRR912079, SRR912077, SRR912075, SRR912053, SRR912052, SRR912051, SRR912046, SRR912045, SRR912020, SRR912018, SRR912017, SRR911995, SRR911994, SRR911993, SRR911974, SRR911973, SRR911968, SRR911967, SRR911966, SRR911938, SRR911937, SRR911936, SRR911915, SRR911914, SRR911913, SRR911912, SRR911883, SRR911882, SRR911832, SRR911831, SRR911830, SRR911787, SRR911720, SRR911696, SRR911695, SRR911674, SRR911653, SRR911651, SRR911626, SRR911562, SRR911298, SRR911297, SRR911296, SRR911273, SRR911272, SRR911271, SRR911270, SRR911246, SRR911245, SRR911244, SRR911243, SRR911242, SRR911221, SRR911220, SRR911210, SRR911209, SRR911208, SRR911189, SRR911188, SRR911187, SRR911186, SRR911159, SRR911158, SRR911157, SRR911136, SRR910973, SRR910972, SRR910971, SRR910912, SRR910911, SRR910910, SRR910909, SRR910908, SRR910902, SRR910901, SRR910900, SRR910899, SRR910898, SRR910874, SRR910873, SRR910872, SRR910871, SRR910870, SRR910869, SRR910848, SRR910847, SRR910846, SRR910844, SRR910843, SRR910819, SRR910818, SRR910817, SRR910816, SRR910811, SRR910810, SRR910786, SRR910785, SRR910784, SRR910783, SRR910782, SRR910758, SRR910757, SRR910756, SRR910755, SRR910734, SRR910733, SRR910732, SRR910713, SRR910648, SRR910647, SRR910646, SRR910645, SRR910586, SRR910585, SRR910584, SRR910501, SRR910500, SRR910417, SRR910414, SRR910392, SRR910390, SRR910389, SRR910387, SRR910357, SRR910338, SRR910336, SRR910319, SRR910318, SRR910317, SRR910296, SRR910295, SRR910294, SRR910293, SRR910233, SRR910231, SRR910230, SRR910229, SRR910228, SRR910204, SRR910203, SRR910202, SRR910181, SRR910180, SRR910179, SRR910178, SRR910177, SRR910118, SRR910117, SRR910116, SRR910111, SRR910110, SRR910049, SRR910048, SRR910047, SRR910046, SRR910045, SRR910026, SRR910025, SRR910001, SRR910000, SRR909999, SRR909972, SRR909971, SRR909970, SRR908309, SRR908308, SRR908307, SRR908215, SRR908214, SRR907903, SRR907902, SRR907901, SRR907900, SRR907899, SRR907898, SRR907897, SRR907896, SRR907895, SRR907894, SRR907893, SRR907892, SRR907891, SRR907890, SRR907889, SRR907888, SRR907887, SRR907886, SRR907585, SRR907584, SRR907583, SRR907324, SRR907308, SRR907307, SRR907287, SRR907286, SRR907284, SRR907283, SRR902026, SRR902025, SRR901839, SRR901837, SRR901769, SRR901768, SRR900790, SRR900017, SRR899744, SRR899547, SRR899546, SRR899512, SRR899511, SRR899510, SRR899509, SRR899508, SRR899507, SRR899498, SRR899440, SRR899439, SRR899438, SRR899433, SRR899432, SRR899431, SRR899430, SRR896619, SRR896255, SRR896254, SRR896253, SRR896252, SRR896251, SRR896250, SRR895789, SRR895788, SRR895787, SRR895786, SRR895785, SRR891594, SRR891358, SRR891324, SRR891293, SRR891292, SRR891284, SRR891267, SRR891260, SRR891247, SRR891238, SRR891237, SRR891236, SRR891235, SRR891234, SRR891233, SRR891232, SRR891231, SRR891230, SRR891225, SRR891223, SRR891222, SRR891221, SRR891220, SRR891219, SRR890731, SRR890616, SRR886308, SRR886305, SRR886280, SRR886275, SRR886274, SRR886273, SRR886272, SRR886269, SRR886268, SRR886267, SRR886266, SRR886265, SRR882054, SRR879376, SRR873449, SRR871487, SRR871078, SRR871077, SRR871076, SRR871075, SRR871074, SRR871069, SRR871068, SRR871067, SRR871066, SRR871065, SRR871064, SRR871063, SRR869776, SRR869775, SRR869774,

SRR868385, SRR868384, SRR868383, SRR868382, SRR868381, SRR868380, SRR868379,
SRR868378, SRR868377, SRR868376, SRR868375, SRR868374, SRR868373, SRR868372,
SRR868371, SRR868370, SRR868369, SRR868368, SRR868367, SRR868366, SRR868365,
SRR868364, SRR868363, SRR868362, SRR868361, SRR868360, SRR868359, SRR868358,
SRR868357, SRR868356, SRR868355, SRR868354, SRR868353, SRR868352, SRR868351,
SRR868350, SRR868349, SRR868348, SRR868347, SRR868346, SRR868345, SRR868344,
SRR868343, SRR868342, SRR868341, SRR868340, SRR868339, SRR868338, SRR868337,
SRR868336, SRR868335, SRR868334, SRR868333, SRR868332, SRR868331, SRR868330,
SRR868329, SRR868328, SRR868327, SRR868326, SRR868325, SRR868324, SRR868323,
SRR868322, SRR868321, SRR868320, SRR868319, SRR868318, SRR868317, SRR868316,
SRR868315, SRR868314, SRR868313, SRR868312, SRR868311, SRR868310, SRR868309,
SRR868308, SRR868307, SRR868306, SRR868305, SRR868304, SRR868303, SRR868302,
SRR868301, SRR868300, SRR868299, SRR868298, SRR868297, SRR868296, SRR868295,
SRR868294, SRR868293, SRR868292, SRR868291, SRR868290, SRR868289, SRR868288,
SRR868287, SRR868286, SRR868285, SRR868284, SRR868283, SRR868282, SRR868281,
SRR868280, SRR868279, SRR868278, SRR868277, SRR868276, SRR868275, SRR868274,
SRR868273, SRR868272, SRR868271, SRR868270, SRR868269, SRR868268, SRR868267,
SRR868266, SRR868265, SRR868264, SRR868263, SRR868262, SRR868261, SRR868260,
SRR868259, SRR868258, SRR868257, SRR868256, SRR868255, SRR868254, SRR868253,
SRR868252, SRR868251, SRR868250, SRR868249, SRR868248, SRR868247, SRR868246,
SRR868245, SRR868244, SRR868243, SRR868242, SRR868241, SRR868240, SRR868239,
SRR868238, SRR868237, SRR868236, SRR868235, SRR868234, SRR868233, SRR868232,
SRR868231, SRR868230, SRR868229, SRR868228, SRR868227, SRR868226, SRR868225,
SRR868224, SRR868223, SRR868222, SRR868221, SRR868220, SRR868219, SRR868218,
SRR868217, SRR868216, SRR868215, SRR868214, SRR868213, SRR868212, SRR868211,
SRR868210, SRR868209, SRR868208, SRR868207, SRR868206, SRR868205, SRR868204,
SRR868203, SRR868202, SRR868201, SRR868200, SRR868199, SRR868198, SRR868197,
SRR868196, SRR868195, SRR868194, SRR868193, SRR868192, SRR868191, SRR868190,
SRR868189, SRR868188, SRR868187, SRR868186, SRR868185, SRR868184, SRR868183,
SRR868182, SRR868181, SRR868180, SRR868179, SRR868178, SRR868177, SRR868176,
SRR868175, SRR868174, SRR868173, SRR868172, SRR868171, SRR868170, SRR868169,
SRR868168, SRR868167, SRR868166, SRR868165, SRR868164, SRR868163, SRR868162,
SRR868161, SRR868160, SRR868159, SRR868158, SRR868157, SRR868156, SRR868155,
SRR868154, SRR868153, SRR868152, SRR868151, SRR868150, SRR868149, SRR868148,
SRR868147, SRR868146, SRR868145, SRR868144, SRR868143, SRR868142, SRR868141,
SRR868140, SRR868139, SRR868138, SRR868137, SRR868136, SRR868135, SRR868134,
SRR868133, SRR868132, SRR868131, SRR868130, SRR868129, SRR868128, SRR868127,
SRR868126, SRR868125, SRR868124, SRR868123, SRR868122, SRR868121, SRR868120,
SRR868119, SRR868118, SRR868117, SRR868116, SRR868115, SRR868114, SRR868113,
SRR868112, SRR868111, SRR868110, SRR868109, SRR868108, SRR868107, SRR868106,
SRR868105, SRR868104, SRR868103, SRR868102, SRR868101, SRR868100, SRR868099,
SRR868098, SRR868097, SRR868096, SRR868095, SRR868094, SRR868093, SRR868092,

SRR868091, SRR868090, SRR868089, SRR868088, SRR868087, SRR868086, SRR868085, SRR868084, SRR868083, SRR868082, SRR868081, SRR868080, SRR868079, SRR868078, SRR868077, SRR868076, SRR868075, SRR868074, SRR868073, SRR868072, SRR868071, SRR868070, SRR868069, SRR868068, SRR868067, SRR868066, SRR868065, SRR868064, SRR868063, SRR868062, SRR868061, SRR868060, SRR868059, SRR868058, SRR868057, SRR868056, SRR868055, SRR868054, SRR868053, SRR868052, SRR868051, SRR868050, SRR868049, SRR868048, SRR868047, SRR868046, SRR868045, SRR868044, SRR868043, SRR868042, SRR868041, SRR868040, SRR868039, SRR868038, SRR868037, SRR868036, SRR868035, SRR868034, SRR868033, SRR868032, SRR868031, SRR868030, SRR868029, SRR868028, SRR868027, SRR868026, SRR868025, SRR868024, SRR868023, SRR868022, SRR868021, SRR868020, SRR868019, SRR868018, SRR868017, SRR868016, SRR868015, SRR868014, SRR868013, SRR868012, SRR868011, SRR868010, SRR868009, SRR868008, SRR868007, SRR868006, SRR868005, SRR868004, SRR868003, SRR868002, SRR868001, SRR868000, SRR867999, SRR867998, SRR867997, SRR867996, SRR867995, SRR867994, SRR867993, SRR867992, SRR867991, SRR867990, SRR867989, SRR867988, SRR867987, SRR867986, SRR867985, SRR867984, SRR867983, SRR867982, SRR867981, SRR867980, SRR867979, SRR867978, SRR867977, SRR867976, SRR867975, SRR867974, SRR867973, SRR867972, SRR867971, SRR867970, SRR867969, SRR867968, SRR867967, SRR867966, SRR867965, SRR867964, SRR867963, SRR867962, SRR867961, SRR867960, SRR867959, SRR867958, SRR867957, SRR867956, SRR867955, SRR867954, SRR867953, SRR867952, SRR867951, SRR867950, SRR867949, SRR867948, SRR867947, SRR867946, SRR867945, SRR867944, SRR867943, SRR867942, SRR867941, SRR867940, SRR867939, SRR867938, SRR867937, SRR867936, SRR867935, SRR867934, SRR867933, SRR867932, SRR867931, SRR867930, SRR867929, SRR867928, SRR867927, SRR867926, SRR867925, SRR867924, SRR867923, SRR867922, SRR867921, SRR867920, SRR867919, SRR867918, SRR867917, SRR867916, SRR867915, SRR867914, SRR867913, SRR867912, SRR867911, SRR867910, SRR867909, SRR867908, SRR867907, SRR867906, SRR867905, SRR867904, SRR867903, SRR867902, SRR867901, SRR867900, SRR867899, SRR867898, SRR867897, SRR867896, SRR867895, SRR867894, SRR867893, SRR867892, SRR867891, SRR867890, SRR867889, SRR867888, SRR867887, SRR867886, SRR867885, SRR867884, SRR867883, SRR867882, SRR867881, SRR867880, SRR867879, SRR867878, SRR867877, SRR867876, SRR867875, SRR867874, SRR867873, SRR867872, SRR867871, SRR867870, SRR867869, SRR867868, SRR867867, SRR867866, SRR867865, SRR867864, SRR867863, SRR867862, SRR867861, SRR867860, SRR867859, SRR867858, SRR867857, SRR867856, SRR867855, SRR867854, SRR867853, SRR867852, SRR867851, SRR867850, SRR867849, SRR867848, SRR867847, SRR867846, SRR867845, SRR867844, SRR867843, SRR867842, SRR867841, SRR867840, SRR867839, SRR867838, SRR867837, SRR867836, SRR867835, SRR867834, SRR867833, SRR867832, SRR867831, SRR867830, SRR867829, SRR867828, SRR867827, SRR867826, SRR867825, SRR867824, SRR867823, SRR867822, SRR867821, SRR867820, SRR867819, SRR867818, SRR867817, SRR867816, SRR867815, SRR867613, SRR867449, SRR867446, SRR867443, SRR867442, SRR867431, SRR867427, SRR867426, SRR867425, SRR867423, SRR867421, SRR867398, SRR867397, SRR867396, SRR867395, SRR867394, SRR867210,

SRR867166, SRR867122, SRR867058, SRR867057, SRR867056, SRR867055, SRR867027, SRR867026, SRR866920, SRR866919, SRR866918, SRR866917, SRR866916, SRR866915, SRR866914, SRR866913, SRR866912, SRR866911, SRR866910, SRR866909, SRR866908, SRR866907, SRR866906, SRR866875, SRR866661, SRR866655, SRR866576, SRR866575, SRR866574, SRR866572, SRR866571, SRR866570, SRR866569, SRR866568, SRR866544, SRR866540, SRR866530, SRR866502, SRR866440, SRR866439, SRR866438, SRR866437, SRR866436, SRR866427, SRR866329, SRR866328, SRR866327, SRR866326, SRR866275, SRR866268, SRR866266, SRR866259, SRR866258, SRR866257, SRR866256, SRR866254, SRR866253, SRR866252, SRR866250, SRR866245, SRR866244, SRR866243, SRR866242, SRR866241, SRR866240, SRR866238, SRR866237, SRR866236, SRR866235, SRR866234, SRR866233, SRR866232, SRR866231, SRR866230, SRR866229, SRR866228, SRR866227, SRR866226, SRR866225, SRR866224, SRR866223, SRR866220, SRR866219, SRR866218, SRR866217, SRR866216, SRR866215, SRR866212, SRR866211, SRR866155, SRR866043, SRR865992, SRR865902, SRR865843, SRR865788, SRR865691, SRR865575, SRR865536, SRR865383, SRR865299, SRR865071, SRR864713, SRR864485, SRR864315, SRR863698, SRR863697, SRR863580, SRR863549, SRR863548, SRR863541, SRR863540, SRR863391, SRR863390, SRR863389, SRR863387, SRR863386, SRR863385, SRR863377, SRR863376, SRR863375, SRR863371, SRR863094, SRR863093, SRR863091, SRR863090, SRR863089, SRR863088, SRR863087, SRR863086, SRR863085, SRR863084, SRR863083, SRR863082, SRR863081, SRR863080, SRR863079, SRR863078, SRR863077, SRR863076, SRR863075, SRR863074, SRR863073, SRR863072, SRR863071, SRR863070, SRR863069, SRR863068, SRR863067, SRR863066, SRR863065, SRR863063, SRR863062, SRR863060, SRR863059, SRR863058, SRR863057, SRR863056, SRR863055, SRR863054, SRR863053, SRR863052, SRR863051, SRR863050, SRR863049, SRR863048, SRR863047, SRR863046, SRR863045, SRR863044, SRR863043, SRR863032, SRR863031, SRR863030, SRR863029, SRR863028, SRR863027, SRR863025, SRR863024, SRR863023, SRR863022, SRR863021, SRR863018, SRR863017, SRR863016, SRR857924, SRR854522, SRR851908, SRR851888, SRR851885, SRR851884, SRR851814, SRR851813, SRR851238, SRR851130, SRR851129, SRR851128, SRR851127, SRR851126, SRR851125, SRR851110, SRR851109, SRR851108, SRR851107, SRR851106, SRR851105, SRR851104, SRR851103, SRR851102, SRR851101, SRR851100, SRR851099, SRR851098, SRR851071, SRR851070, SRR851069, SRR851068, SRR851067, SRR850922, SRR850834, SRR850732, SRR849499, SRR849498, SRR849062, SRR848997, SRR848996, SRR848995, SRR848922, SRR848921, SRR847766, SRR847765, SRR847734, SRR847532, SRR847531, SRR847530, SRR847528, SRR847506, SRR847505, SRR847504, SRR847503, SRR847502, SRR847501, SRR847313, SRR847308, SRR847305, SRR847033, SRR847032, SRR847031, SRR847030, SRR837800, SRR837772, SRR837757, SRR837756, SRR837755, SRR837668, SRR837667, SRR837666, SRR837665, SRR837664, SRR837663, SRR837662, SRR837661, SRR837660, SRR837658, SRR837657, SRR837656, SRR837655, SRR837654, SRR837653, SRR837652, SRR837651, SRR837650, SRR837649, SRR837648, SRR837647, SRR837646, SRR837645, SRR837644, SRR837643, SRR837642, SRR837641, SRR837640, SRR837639, SRR837638, SRR837637, SRR837636, SRR837635, SRR837634, SRR837633, SRR837632, SRR837631, SRR837630, SRR837629, SRR837628, SRR837627,

SRR837626, SRR837625, SRR837624, SRR837623, SRR837622, SRR837621, SRR837620, SRR837619, SRR837618, SRR837617, SRR837616, SRR837615, SRR837614, SRR837613, SRR837612, SRR837611, SRR837610, SRR837609, SRR837608, SRR837607, SRR837606, SRR837605, SRR837604, SRR837603, SRR837602, SRR837601, SRR837600, SRR837599, SRR837598, SRR837597, SRR837596, SRR837595, SRR837594, SRR837593, SRR837592, SRR837591, SRR837590, SRR837589, SRR837588, SRR837587, SRR837586, SRR837585, SRR837584, SRR837583, SRR837582, SRR837581, SRR837580, SRR837579, SRR837578, SRR837577, SRR837576, SRR837575, SRR837574, SRR837573, SRR837572, SRR837571, SRR837570, SRR837569, SRR837568, SRR837567, SRR837566, SRR837565, SRR837564, SRR837563, SRR837562, SRR837561, SRR837560, SRR837559, SRR837558, SRR837557, SRR837556, SRR837555, SRR837554, SRR837553, SRR837552, SRR837551, SRR837550, SRR837549, SRR837548, SRR837547, SRR837546, SRR837545, SRR837544, SRR837543, SRR837536, SRR837535, SRR837407, SRR837378, SRR836267, SRR836265, SRR836263, SRR836262, SRR836245, SRR836241, SRR836238, SRR836233, SRR836231, SRR836212, SRR836208, SRR836206, SRR836085, SRR835951, SRR835950, SRR835949, SRR835948, SRR835947, SRR835945, SRR835909, SRR835908, SRR835773, SRR835772, SRR835771, SRR835770, SRR835769, SRR835768, SRR835767, SRR835766, SRR835765, SRR835764, SRR835763, SRR835762, SRR835761, SRR835760, SRR835759, SRR835758, SRR835508, SRR835507, SRR835505, SRR835483, SRR835482, SRR835478, SRR835477, SRR835467, SRR835449, SRR835318, SRR834502, SRR834501, SRR833802, SRR833801, SRR833618, SRR833617, SRR833616, SRR833549, SRR833225, SRR833224, SRR832973, SRR832972, SRR832845, SRR832844, SRR832843, SRR832842, SRR832841, SRR832840, SRR832839, SRR832838, SRR832837, SRR832836, SRR831714, SRR831703, SRR831693, SRR831691, SRR831690, SRR831591, SRR831590, SRR831589, SRR831588, SRR831587, SRR831586, SRR831190, SRR831173, SRR831172, SRR831171, SRR831170, SRR831169, SRR831168, SRR831167, SRR831166, SRR831108, SRR831090, SRR831089, SRR831088, SRR831087, SRR831086, SRR831084, SRR831083, SRR831082, SRR831072, SRR831071, SRR831070, SRR831069, SRR831051, SRR831050, SRR831049, SRR831048, SRR831047, SRR831046, SRR831045, SRR830592, SRR830399, SRR830211, SRR830210, SRR830209, SRR830208, SRR830207, SRR830206, SRR830205, SRR830204, SRR830203, SRR830202, SRR830201, SRR830200, SRR830199, SRR830198, SRR830197, SRR830196, SRR830195, SRR830194, SRR830193, SRR830192, SRR830191, SRR830190, SRR830189, SRR830188, SRR830187, SRR830186, SRR830185, SRR830184, SRR830183, SRR830182, SRR828682, SRR827698, SRR827697, SRR827696, SRR827695, SRR827694, SRR827693, SRR827692, SRR827691, SRR827690, SRR827689, SRR827688, SRR827687, SRR827686, SRR827685, SRR827684, SRR827683, SRR827682, SRR827681, SRR827680, SRR827679, SRR827678, SRR827677, SRR827676, SRR827675, SRR827674, SRR827673, SRR827672, SRR827671, SRR827670, SRR827669, SRR827668, SRR827667, SRR827666, SRR827665, SRR827664, SRR827663, SRR827662, SRR827661, SRR827660, SRR827659, SRR827658, SRR827657, SRR827656, SRR827655, SRR827654, SRR827653, SRR827601, SRR827595, SRR826653, SRR826652, SRR826651, SRR826650, SRR826649, SRR826648, SRR826647, SRR826646, SRR826643, SRR826642, SRR826641, SRR826640, SRR826639, SRR826638, SRR826637, SRR826636,

SRR826635, SRR826634, SRR826633, SRR826632, SRR826631, SRR826630, SRR826629, SRR826628, SRR826627, SRR826626, SRR826625, SRR826624, SRR826623, SRR826622, SRR826621, SRR826620, SRR826619, SRR826618, SRR826617, SRR826616, SRR826615, SRR826614, SRR826613, SRR826612, SRR826611, SRR826610, SRR826609, SRR826608, SRR826607, SRR826606, SRR826605, SRR826604, SRR826603, SRR826602, SRR826601, SRR826600, SRR826598, SRR826597, SRR826596, SRR826595, SRR826594, SRR826593, SRR826592, SRR826591, SRR826590, SRR826589, SRR826588, SRR826587, SRR826586, SRR826585, SRR826584, SRR826583, SRR826582, SRR826581, SRR826580, SRR826579, SRR826578, SRR826577, SRR826576, SRR826575, SRR826574, SRR826573, SRR826572, SRR826571, SRR826570, SRR826569, SRR826568, SRR826567, SRR826566, SRR826565, SRR826564, SRR826563, SRR826562, SRR826561, SRR826560, SRR826559, SRR826558, SRR826556, SRR826555, SRR826554, SRR826553, SRR826552, SRR826551, SRR826550, SRR826549, SRR826548, SRR826547, SRR826489, SRR826488, SRR825916, SRR825915, SRR825914, SRR825913, SRR825912, SRR825911, SRR825910, SRR825909, SRR825908, SRR825907, SRR825906, SRR825905, SRR825904, SRR825903, SRR825902, SRR825901, SRR825900, SRR825899, SRR825898, SRR825897, SRR825896, SRR825895, SRR825894, SRR825892, SRR825891, SRR825890, SRR825889, SRR825887, SRR825885, SRR825884, SRR825883, SRR825882, SRR825880, SRR825878, SRR825877, SRR825876, SRR825875, SRR825873, SRR825871, SRR825870, SRR825869, SRR825612, SRR825611, SRR825610, SRR825609, SRR825608, SRR825607, SRR825606, SRR825605, SRR825604, SRR825603, SRR825602, SRR825601, SRR825600, SRR825599, SRR825598, SRR825597, SRR825596, SRR825595, SRR825594, SRR825593, SRR825592, SRR825591, SRR825590, SRR825589, SRR825588, SRR825587, SRR825586, SRR825585, SRR825584, SRR825583, SRR825582, SRR825581, SRR825580, SRR825579, SRR825214, SRR825194, SRR825192, SRR825191, SRR824755, SRR824732, SRR824163, SRR824162, SRR824161, SRR824160, SRR824159, SRR824158, SRR824157, SRR824156, SRR824155, SRR824150, SRR824149, SRR824104, SRR824102, SRR824101, SRR824100, SRR824099, SRR824098, SRR824081, SRR824080, SRR824079, SRR824071, SRR823556, SRR823555, SRR823554, SRR823553, SRR823552, SRR823551, SRR823550, SRR823549, SRR823548, SRR823547, SRR823546, SRR823545, SRR823544, SRR823543, SRR823398, SRR823333, SRR823328, SRR822929, SRR822477, SRR822474, SRR822472, SRR822470, SRR822402, SRR822401, SRR821833, SRR818724, SRR818723, SRR815091, SRR813801, SRR809042, SRR808807, SRR808806, SRR808805, SRR808043, SRR807369, SRR807368, SRR804915, SRR804914, SRR804913, SRR804912, SRR803021, SRR802994, SRR802919, SRR802896, SRR801483, SRR800754, SRR800753, SRR800645, SRR800644, SRR800615, SRR800614, SRR800613, SRR800612, SRR800611, SRR800610, SRR799414, SRR799358, SRR799357, SRR799356, SRR799321, SRR799319, SRR799314, SRR797946, SRR797892, SRR797891, SRR797890, SRR797889, SRR797888, SRR797887, SRR797886, SRR797885, SRR797884, SRR797883, SRR797882, SRR797881, SRR797568, SRR797567, SRR797566, SRR797565, SRR797564, SRR797563, SRR797562, SRR797561, SRR797560, SRR797559, SRR797558, SRR797557, SRR797556, SRR797555, SRR797554, SRR797553, SRR797552, SRR797551, SRR797230, SRR797218, SRR797211, SRR797210, SRR797208, SRR797069, SRR797042, SRR794300, SRR791234, SRR791233,

SRR791232, SRR791231, SRR791230, SRR791229, SRR790660, SRR790650, SRR790649, SRR790648, SRR790624, SRR789755, SRR789753, SRR789748, SRR789746, SRR789738, SRR789736, SRR789731, SRR789729, SRR789724, SRR789719, SRR789717, SRR789714, SRR789710, SRR789706, SRR789700, SRR789696, SRR789689, SRR788904, SRR788859, SRR788217, SRR788216, SRR788215, SRR788214, SRR788213, SRR788212, SRR788211, SRR788210, SRR788209, SRR788208, SRR788207, SRR788206, SRR788205, SRR788199, SRR788198, SRR788197, SRR788196, SRR788195, SRR788194, SRR788193, SRR788192, SRR788191, SRR788190, SRR788189, SRR788188, SRR788187, SRR788186, SRR788185, SRR788184, SRR788183, SRR788182, SRR788181, SRR788180, SRR788179, SRR788178, SRR788177, SRR788176, SRR788175, SRR788174, SRR788173, SRR788172, SRR788171, SRR788170, SRR788169, SRR788168, SRR788167, SRR788166, SRR788165, SRR788164, SRR788163, SRR788162, SRR788161, SRR788160, SRR788159, SRR788157, SRR788156, SRR788155, SRR788154, SRR788153, SRR788152, SRR788151, SRR788150, SRR788149, SRR788148, SRR788147, SRR788146, SRR788145, SRR788144, SRR788143, SRR788142, SRR788141, SRR788140, SRR788139, SRR788138, SRR788137, SRR788136, SRR788135, SRR788134, SRR788133, SRR788132, SRR788131, SRR788130, SRR788129, SRR788128, SRR788127, SRR788126, SRR788125, SRR788124, SRR788123, SRR788122, SRR788121, SRR788120, SRR788119, SRR788118, SRR788117, SRR788116, SRR788115, SRR788114, SRR788113, SRR788112, SRR788111, SRR788110, SRR788109, SRR788108, SRR788107, SRR788106, SRR788105, SRR788104, SRR788103, SRR788102, SRR788101, SRR788100, SRR788099, SRR788098, SRR787660, SRR787658, SRR787655, SRR787653, SRR787651, SRR787648, SRR787646, SRR787645, SRR787644, SRR787641, SRR787639, SRR787638, SRR787637, SRR787634, SRR787632, SRR787631, SRR787630, SRR787627, SRR787625, SRR787624, SRR787623, SRR787620, SRR787617, SRR787616, SRR787615, SRR787612, SRR787597, SRR787596, SRR787595, SRR787594, SRR787592, SRR787294, SRR787293, SRR787292, SRR787291, SRR786988, SRR786987, SRR786986, SRR786985, SRR786984, SRR786983, SRR786982, SRR786981, SRR786980, SRR786979, SRR786612, SRR786610, SRR786609, SRR786608, SRR786607, SRR786605, SRR786600, SRR786595, SRR786590, SRR786588, SRR786583, SRR786581, SRR786576, SRR786574, SRR786569, SRR786567, SRR786562, SRR786560, SRR786555, SRR786553, SRR786548, SRR786546, SRR786541, SRR786539, SRR786534, SRR786532, SRR786527, SRR786525, SRR786520, SRR786518, SRR786513, SRR786511, SRR786506, SRR786424, SRR786423, SRR786422, SRR786421, SRR776586, SRR776585, SRR776584, SRR776583, SRR774996, SRR774989, SRR771961, SRR771960, SRR771959, SRR771958, SRR771957, SRR771956, SRR771955, SRR771954, SRR771953, SRR771952, SRR771951, SRR771950, SRR771949, SRR771948, SRR771947, SRR771946, SRR771945, SRR771944, SRR771943, SRR771942, SRR771941, SRR771940, SRR771939, SRR771938, SRR771937, SRR771936, SRR771935, SRR771934, SRR771933, SRR771932, SRR771931, SRR771930, SRR771929, SRR771928, SRR771927, SRR771926, SRR771925, SRR771924, SRR771613, SRR771612, SRR771537, SRR771536, SRR771535, SRR771531, SRR771530, SRR771529, SRR771528, SRR771527, SRR771507, SRR771506, SRR771505, SRR771504, SRR771501, SRR771500, SRR771499, SRR771498, SRR771497, SRR771496, SRR771495, SRR771494, SRR771413, SRR770578, SRR770057, SRR770056,

SRR770055, SRR770054, SRR770053, SRR769750, SRR769749, SRR768892, SRR768864, SRR768857, SRR768850, SRR768843, SRR768836, SRR768828, SRR768819, SRR768792, SRR768645, SRR768640, SRR768638, SRR768633, SRR768626, SRR768619, SRR768604, SRR768597, SRR768489, SRR768486, SRR768445, SRR768444, SRR768443, SRR768442, SRR768251, SRR768250, SRR768249, SRR768248, SRR768133, SRR768130, SRR767741, SRR767739, SRR767738, SRR767733, SRR767726, SRR767718, SRR767703, SRR767696, SRR767689, SRR767682, SRR767672, SRR767671, SRR767670, SRR767668, SRR766793, SRR765947, SRR765943, SRR765628, SRR765621, SRR765614, SRR765607, SRR765600, SRR765593, SRR765586, SRR765579, SRR765572, SRR765565, SRR765558, SRR765549, SRR765542, SRR765535, SRR765528, SRR765521, SRR765514, SRR765507, SRR765500, SRR765493, SRR765486, SRR765479, SRR765472, SRR765465, SRR765458, SRR765454, SRR765447, SRR765440, SRR765433, SRR765426, SRR765419, SRR765412, SRR765405, SRR765398, SRR765391, SRR765384, SRR765377, SRR765370, SRR765363, SRR765356, SRR765352, SRR765345, SRR765338, SRR765331, SRR765324, SRR765317, SRR765310, SRR765303, SRR765296, SRR765289, SRR765282, SRR765275, SRR765268, SRR765261, SRR765250, SRR765243, SRR765236, SRR765229, SRR765222, SRR765215, SRR765208, SRR765201, SRR765194, SRR765187, SRR765180, SRR765173, SRR765166, SRR765159, SRR765150, SRR765143, SRR765136, SRR765129, SRR764887, SRR764886, SRR764885, SRR764875, SRR764874, SRR764873, SRR764872, SRR764871, SRR764870, SRR764869, SRR764868, SRR764867, SRR764866, SRR764865, SRR764864, SRR764863, SRR764862, SRR764861, SRR764860, SRR764859, SRR764858, SRR764857, SRR764663, SRR764648, SRR764640, SRR764633, SRR764626, SRR764625, SRR764624, SRR764623, SRR764622, SRR764621, SRR764620, SRR764619, SRR764618, SRR764617, SRR764616, SRR764615, SRR764614, SRR764613, SRR764612, SRR764611, SRR764610, SRR764609, SRR764608, SRR762396, SRR762389, SRR762381, SRR762374, SRR762366, SRR762356, SRR762349, SRR757320, SRR748730, SRR748729, SRR748728, SRR748727, SRR748726, SRR748725, SRR748724, SRR748723, SRR748722, SRR748721, SRR748720, SRR748719, SRR748718, SRR748717, SRR748716, SRR748715, SRR748714, SRR748713, SRR748712, SRR748711, SRR748710, SRR748709, SRR748708, SRR748707, SRR748706, SRR748705, SRR748704, SRR748703, SRR748702, SRR748701, SRR748700, SRR748699, SRR748698, SRR748697, SRR748696, SRR748695, SRR748694, SRR748693, SRR748692, SRR748691, SRR748690, SRR748689, SRR748688, SRR748687, SRR748686, SRR748685, SRR748684, SRR748683, SRR748682, SRR748681, SRR748680, SRR748679, SRR748678, SRR748676, SRR748675, SRR748672, SRR748671, SRR748670, SRR748669, SRR748668, SRR748667, SRR748666, SRR748665, SRR748664, SRR748663, SRR748662, SRR748661, SRR748660, SRR748659, SRR748658, SRR748657, SRR748656, SRR748655, SRR748654, SRR748653, SRR748652, SRR748651, SRR748650, SRR748649, SRR748648, SRR748647, SRR748646, SRR748645, SRR748644, SRR748643, SRR748642, SRR748641, SRR748640, SRR748639, SRR748638, SRR748637, SRR748636, SRR748635, SRR748634, SRR748633, SRR748632, SRR748631, SRR748630, SRR748629, SRR748628, SRR748627, SRR748626, SRR748625, SRR748624, SRR748623, SRR748622, SRR748621, SRR748620, SRR748619, SRR748618, SRR748617, SRR748616, SRR748615, SRR748614, SRR748613, SRR748612, SRR748611, SRR748610,

SRR748609, SRR748608, SRR748607, SRR748606, SRR748605, SRR748604, SRR748603, SRR748602, SRR748601, SRR748600, SRR748599, SRR748598, SRR748597, SRR748591, SRR748590, SRR748589, SRR748588, SRR748587, SRR748586, SRR748585, SRR748584, SRR748583, SRR748582, SRR748581, SRR748580, SRR748579, SRR748578, SRR748577, SRR747777, SRR747762, SRR711330, SRR711329, SRR711328, SRR711327, SRR711326, SRR711325, SRR711324, SRR711323, SRR711322, SRR711321, SRR711320, SRR711319, SRR711318, SRR711317, SRR711316, SRR711315, SRR711314, SRR711313, SRR711312, SRR710275, SRR707465, SRR707464, SRR707463, SRR707462, SRR700533, SRR697013, SRR696988, SRR696966, SRR696542, SRR685298, SRR674068, SRR674061, SRR674054, SRR674047, SRR674040, SRR674033, SRR674026, SRR671953, SRR671952, SRR671951, SRR671950, SRR671949, SRR671948, SRR671947, SRR671946, SRR670400, SRR670353, SRR670346, SRR669871, SRR669870, SRR669869, SRR669868, SRR669867, SRR669866, SRR669865, SRR669864, SRR669863, SRR669862, SRR669861, SRR669860, SRR669859, SRR669858, SRR669857, SRR669856, SRR669855, SRR669854, SRR669853, SRR669852, SRR669851, SRR669850, SRR669849, SRR669848, SRR669847, SRR669846, SRR669845, SRR669844, SRR669843, SRR669842, SRR669841, SRR669840, SRR669839, SRR669838, SRR669837, SRR669836, SRR669835, SRR669834, SRR669833, SRR669832, SRR669831, SRR669830, SRR669829, SRR669828, SRR669827, SRR669826, SRR669825, SRR669824, SRR669823, SRR669822, SRR669821, SRR669820, SRR669819, SRR669818, SRR669817, SRR669816, SRR669815, SRR669814, SRR669813, SRR669812, SRR669811, SRR669810, SRR669809, SRR669808, SRR669807, SRR669806, SRR669805, SRR669804, SRR669803, SRR669802, SRR669801, SRR669800, SRR669799, SRR669798, SRR669797, SRR669796, SRR669795, SRR669794, SRR669793, SRR669792, SRR669791, SRR669790, SRR669789, SRR656740, SRR656739, SRR656222, SRR656221, SRR656220, SRR656219, SRR656218, SRR656217, SRR656216, SRR656215, SRR654702, SRR654700, SRR654699, SRR654695, SRR654693, SRR654692, SRR654690, SRR654187, SRR654022, SRR654015, SRR654008, SRR654001, SRR653994, SRR653992, SRR653985, SRR653969, SRR653960, SRR653905, SRR653904, SRR653899, SRR653898, SRR653596, SRR653595, SRR653594, SRR653593, SRR653592, SRR653591, SRR653590, SRR653589, SRR653588, SRR653587, SRR653586, SRR653585, SRR653584, SRR653583, SRR653582, SRR653581, SRR653580, SRR653579, SRR653578, SRR653577, SRR653576, SRR653575, SRR653574, SRR653573, SRR653572, SRR653571, SRR653570, SRR653569, SRR653568, SRR653567, SRR653566, SRR653565, SRR653564, SRR653563, SRR653562, SRR653561, SRR653560, SRR653559, SRR653558, SRR653557, SRR653556, SRR653555, SRR653192, SRR653089, SRR653068, SRR653067, SRR653066, SRR653065, SRR653064, SRR653063, SRR653061, SRR653060, SRR653059, SRR653058, SRR652486, SRR652469, SRR652153, SRR652152, SRR652151, SRR652150, SRR652147, SRR651721, SRR651110, SRR651109, SRR651108, SRR651107, SRR651106, SRR651105, SRR651084, SRR651077, SRR651070, SRR651063, SRR651056, SRR651049, SRR650377, SRR650329, SRR650328, SRR650327, SRR650326, SRR650325, SRR650324, SRR650323, SRR650322, SRR649747, SRR649746, SRR649745, SRR649744, SRR649743, SRR649742, SRR649741, SRR649740, SRR649739, SRR649738, SRR649737, SRR649539, SRR649538, SRR649537, SRR648516, SRR648515, SRR648514, SRR648513, SRR648512,

SRR648511, SRR648510, SRR648509, SRR648508, SRR648507, SRR648506, SRR648505, SRR648504, SRR648503, SRR648502, SRR648501, SRR648500, SRR648499, SRR648498, SRR648497, SRR648496, SRR648495, SRR648494, SRR648493, SRR648303, SRR648276, SRR648275, SRR648274, SRR647489, SRR647488, SRR647487, SRR647486, SRR647070, SRR647053, SRR646510, SRR646509, SRR646508, SRR646507, SRR646506, SRR646505, SRR646504, SRR646503, SRR646502, SRR646501, SRR646500, SRR646499, SRR646498, SRR646497, SRR646496, SRR646495, SRR646494, SRR643880, SRR643628, SRR643627, SRR643626, SRR643625, SRR643624, SRR643623, SRR643622, SRR643621, SRR643608, SRR643413, SRR643412, SRR643411, SRR643410, SRR643409, SRR643408, SRR643407, SRR643406, SRR643405, SRR643404, SRR643403, SRR643402, SRR643401, SRR643400, SRR643263, SRR643262, SRR643261, SRR643260, SRR640308, SRR640307, SRR640306, SRR640305, SRR640304, SRR640303, SRR640270, SRR640269, SRR640268, SRR640267, SRR640266, SRR640265, SRR640264, SRR640263, SRR639177, SRR639176, SRR639175, SRR639174, SRR639173, SRR639172, SRR639171, SRR639170, SRR639169, SRR639168, SRR639167, SRR639166, SRR639165, SRR639164, SRR639163, SRR639162, SRR638996, SRR638995, SRR638994, SRR638993, SRR638992, SRR638991, SRR638990, SRR638973, SRR638972, SRR638970, SRR638963, SRR638960, SRR638916, SRR638913, SRR638911, SRR638900, SRR638899, SRR638713, SRR638712, SRR638711, SRR638710, SRR638709, SRR636248, SRR636247, SRR636246, SRR636245, SRR636244, SRR636243, SRR634974, SRR634973, SRR634972, SRR634971, SRR634970, SRR634969, SRR634963, SRR634962, SRR634961, SRR634960, SRR633741, SRR633740, SRR633739, SRR633738, SRR633737, SRR633736, SRR633735, SRR633734, SRR633733, SRR633732, SRR633731, SRR633730, SRR633729, SRR633728, SRR633727, SRR633726, SRR631048, SRR631047, SRR631035, SRR631034, SRR630928, SRR630927, SRR630926, SRR630925, SRR630924, SRR630923, SRR630922, SRR629688, SRR627961, SRR627960, SRR627959, SRR627958, SRR627957, SRR627956, SRR627955, SRR627954, SRR627953, SRR627952, SRR627951, SRR627772, SRR627771, SRR627770, SRR627769, SRR627768, SRR627767, SRR627766, SRR627765, SRR627764, SRR627763, SRR627762, SRR627688, SRR627687, SRR627686, SRR627685, SRR627684, SRR627683, SRR627682, SRR627681, SRR627680, SRR627679, SRR627678, SRR627677, SRR627676, SRR627675, SRR627674, SRR627673, SRR627672, SRR627671, SRR627670, SRR627669, SRR627668, SRR627667, SRR627666, SRR627665, SRR627664, SRR627663, SRR627662, SRR627661, SRR627660, SRR627659, SRR627658, SRR627657, SRR627656, SRR627655, SRR627654, SRR627653, SRR627652, SRR627651, SRR627650, SRR627649, SRR627648, SRR627647, SRR627646, SRR627645, SRR627644, SRR627643, SRR627642, SRR627641, SRR627640, SRR627639, SRR627638, SRR627637, SRR627636, SRR627635, SRR627634, SRR627633, SRR627632, SRR627631, SRR627630, SRR627629, SRR627535, SRR627534, SRR627533, SRR627532, SRR627531, SRR627530, SRR627529, SRR625315, SRR625314, SRR620389, SRR620388, SRR620387, SRR620386, SRR620385, SRR620384, SRR620383, SRR620382, SRR620381, SRR620380, SRR620379, SRR620378, SRR620377, SRR620376, SRR620167, SRR620166, SRR620030, SRR620029, SRR619800, SRR619799, SRR619798, SRR619797, SRR619794, SRR619793, SRR619792, SRR619791, SRR619790, SRR619789, SRR619788, SRR619787, SRR619081, SRR619080, SRR619079,

SRR619078, SRR617238, SRR617237, SRR617236, SRR617235, SRR617234, SRR617233, SRR617038, SRR617037, SRR617010, SRR616714, SRR616713, SRR616260, SRR611651, SRR611650, SRR611649, SRR611648, SRR611543, SRR611542, SRR611541, SRR611540, SRR611339, SRR611338, SRR611337, SRR611336, SRR611335, SRR611334, SRR611333, SRR611332, SRR611331, SRR611330, SRR611329, SRR611328, SRR611327, SRR611326, SRR611325, SRR611324, SRR611323, SRR611322, SRR611321, SRR611320, SRR611319, SRR611318, SRR611317, SRR611316, SRR611315, SRR611314, SRR611313, SRR611312, SRR611311, SRR611310, SRR611309, SRR611308, SRR611307, SRR611306, SRR611305, SRR611304, SRR611303, SRR611302, SRR611301, SRR611300, SRR611299, SRR611298, SRR611297, SRR611296, SRR611295, SRR611294, SRR611293, SRR611292, SRR611291, SRR611290, SRR611289, SRR611288, SRR611287, SRR611278, SRR611277, SRR611276, SRR611275, SRR611274, SRR611273, SRR611272, SRR611271, SRR611270, SRR611269, SRR611268, SRR611266, SRR611265, SRR611264, SRR611262, SRR611259, SRR611253, SRR611252, SRR611247, SRR611246, SRR611243, SRR611242, SRR611241, SRR611240, SRR611239, SRR611238, SRR611237, SRR611236, SRR611235, SRR611234, SRR611233, SRR611232, SRR611231, SRR611230, SRR611229, SRR611228, SRR611227, SRR611226, SRR611225, SRR611224, SRR611223, SRR611221, SRR611220, SRR611219, SRR611218, SRR611217, SRR611216, SRR611215, SRR611214, SRR611213, SRR611212, SRR611211, SRR611210, SRR611209, SRR611208, SRR611207, SRR611206, SRR611205, SRR611204, SRR611203, SRR611202, SRR609270, SRR609269, SRR609268, SRR609267, SRR606855, SRR606854, SRR606853, SRR606852, SRR606415, SRR606414, SRR606413, SRR606412, SRR606411, SRR606410, SRR606408, SRR606407, SRR606406, SRR606405, SRR605694, SRR605693, SRR605692, SRR605691, SRR605690, SRR605689, SRR605688, SRR605687, SRR605686, SRR605685, SRR605684, SRR605683, SRR605662, SRR605661, SRR605660, SRR605659, SRR605658, SRR605657, SRR604832, SRR604831, SRR604830, SRR604829, SRR595056, SRR595055, SRR595054, SRR595053, SRR595052, SRR595051, SRR595050, SRR595048, SRR595047, SRR595046, SRR584137, SRR584136, SRR584135, SRR584134, SRR584133, SRR584132, SRR584131, SRR584130, SRR584129, SRR584128, SRR584127, SRR584126, SRR584125, SRR584124, SRR584123, SRR584122, SRR584121, SRR584120, SRR584119, SRR584118, SRR584117, SRR584116, SRR584115, SRR580951, SRR580950, SRR580949, SRR580948, SRR579528, SRR578948, SRR578947, SRR578946, SRR578945, SRR578944, SRR578943, SRR578942, SRR578941, SRR578940, SRR577040, SRR576932, SRR576931, SRR576329, SRR576328, SRR576327, SRR576122, SRR576121, SRR576120, SRR576119, SRR575706, SRR575705, SRR575688, SRR574721, SRR574720, SRR574719, SRR574718, SRR574717, SRR574716, SRR574715, SRR574714, SRR574713, SRR574712, SRR574711, SRR574710, SRR574709, SRR574708, SRR574707, SRR574706, SRR574705, SRR574704, SRR574703, SRR574702, SRR574701, SRR574700, SRR574699, SRR574698, SRR574697, SRR574696, SRR574695, SRR574694, SRR574693, SRR574692, SRR574691, SRR574690, SRR574689, SRR574688, SRR574687, SRR574686, SRR574685, SRR574684, SRR574683, SRR574682, SRR574681, SRR574680, SRR574679, SRR574678, SRR574677, SRR574676, SRR574675, SRR574674, SRR574673, SRR574672, SRR574671, SRR574670, SRR574669, SRR574668, SRR574667, SRR574666, SRR574665, SRR574664, SRR574663,

SRR574662, SRR574661, SRR574660, SRR574659, SRR574658, SRR574657, SRR574656, SRR574655, SRR574654, SRR574653, SRR574652, SRR574651, SRR574650, SRR574649, SRR574648, SRR574647, SRR574646, SRR574645, SRR574644, SRR574643, SRR574642, SRR574641, SRR574640, SRR574639, SRR574638, SRR574637, SRR574636, SRR574635, SRR574634, SRR574609, SRR574608, SRR574606, SRR572427, SRR572426, SRR572425, SRR572424, SRR572423, SRR572422, SRR571996, SRR571995, SRR571994, SRR571993, SRR571992, SRR571991, SRR571990, SRR571989, SRR571988, SRR571987, SRR571986, SRR571985, SRR571984, SRR569186, SRR568000, SRR567999, SRR567998, SRR567997, SRR566604, SRR566603, SRR566602, SRR566601, SRR563428, SRR563427, SRR563420, SRR563419, SRR561003, SRR553456, SRR553455, SRR553454, SRR553453, SRR548278, SRR548277, SRR547533, SRR547532, SRR547531, SRR546170, SRR546165, SRR546154, SRR546153, SRR546152, SRR546151, SRR546150, SRR546149, SRR546148, SRR546147, SRR546143, SRR546142, SRR546141, SRR544881, SRR544880, SRR542482, SRR542481, SRR542480, SRR542479, SRR542478, SRR537150, SRR537149, SRR537148, SRR537147, SRR537146, SRR537145, SRR537144, SRR537143, SRR537142, SRR537141, SRR537140, SRR537139, SRR537138, SRR537137, SRR537136, SRR537135, SRR537134, SRR537133, SRR537015, SRR537014, SRR537013, SRR537012, SRR537011, SRR537010, SRR537009, SRR537008, SRR537007, SRR537006, SRR537005, SRR537004, SRR537003, SRR537002, SRR537001, SRR537000, SRR536976, SRR536975, SRR536841, SRR536840, SRR536839, SRR536838, SRR536837, SRR536836, SRR536835, SRR536834, SRR536791, SRR536789, SRR531822, SRR531821, SRR531820, SRR531819, SRR531455, SRR531454, SRR531310, SRR531309, SRR531308, SRR529406, SRR527811, SRR527810, SRR525170, SRR525168, SRR525166, SRR525165, SRR525164, SRR525163, SRR525162, SRR525161, SRR525160, SRR525159, SRR525158, SRR525157, SRR525156, SRR525155, SRR525154, SRR525153, SRR525152, SRR525151, SRR525150, SRR525149, SRR525148, SRR525147, SRR525146, SRR525145, SRR525144, SRR525143, SRR525142, SRR525141, SRR525140, SRR525139, SRR525138, SRR525137, SRR525136, SRR525135, SRR525134, SRR525133, SRR525132, SRR525131, SRR525130, SRR525129, SRR525128, SRR525127, SRR525126, SRR525125, SRR525124, SRR525123, SRR525122, SRR525121, SRR525120, SRR525119, SRR525118, SRR525117, SRR525116, SRR525115, SRR525114, SRR525113, SRR525112, SRR525111, SRR525110, SRR525109, SRR525108, SRR525107, SRR525106, SRR525105, SRR525104, SRR525103, SRR525102, SRR525101, SRR524735, SRR524734, SRR524733, SRR524732, SRR524731, SRR524730, SRR524729, SRR524728, SRR522516, SRR522483, SRR522482, SRR522481, SRR522480, SRR521600, SRR521599, SRR521598, SRR521597, SRR521596, SRR521595, SRR521594, SRR521593, SRR521592, SRR521591, SRR521590, SRR521589, SRR521269, SRR521268, SRR521267, SRR521266, SRR521140, SRR521139, SRR521138, SRR521137, SRR521136, SRR521135, SRR521134, SRR521133, SRR521132, SRR521131, SRR521130, SRR521129, SRR521128, SRR521127, SRR521126, SRR521125, SRR521124, SRR521123, SRR521122, SRR521121, SRR521120, SRR521119, SRR521118, SRR521117, SRR521116, SRR521115, SRR521114, SRR521113, SRR521112, SRR521111, SRR521006, SRR521005, SRR521004, SRR521003, SRR521002, SRR521001, SRR521000, SRR520999, SRR520998, SRR520383, SRR520377, SRR520375, SRR520373, SRR520366, SRR520365,

SRR520364, SRR520363, SRR520248, SRR520247, SRR520246, SRR520245, SRR520244, SRR520243, SRR520242, SRR520241, SRR520240, SRR520239, SRR520238, SRR520237, SRR518044, SRR518043, SRR518042, SRR518041, SRR518040, SRR518039, SRR517966, SRR517965, SRR517964, SRR517963, SRR517610, SRR517609, SRR517608, SRR517607, SRR516818, SRR516817, SRR516816, SRR516815, SRR516814, SRR516813, SRR516812, SRR516810, SRR516798, SRR516797, SRR516796, SRR516795, SRR516201, SRR515921, SRR515920, SRR515919, SRR515918, SRR515917, SRR515916, SRR515915, SRR515493, SRR515492, SRR515491, SRR515490, SRR515489, SRR515363, SRR515362, SRR515340, SRR515339, SRR515338, SRR515337, SRR515336, SRR515335, SRR515334, SRR515333, SRR515332, SRR515331, SRR515330, SRR515329, SRR515328, SRR515327, SRR515326, SRR515325, SRR515324, SRR515323, SRR515322, SRR515321, SRR515320, SRR515319, SRR515318, SRR515317, SRR515181, SRR515180, SRR515007, SRR515006, SRR515005, SRR515004, SRR515003, SRR515002, SRR515001, SRR515000, SRR514999, SRR514998, SRR514997, SRR514174, SRR513551, SRR513550, SRR513549, SRR513548, SRR513547, SRR513546, SRR512813, SRR512812, SRR512811, SRR512810, SRR505746, SRR505745, SRR505744, SRR505743, SRR505138, SRR505137, SRR505136, SRR505135, SRR504537, SRR504536, SRR504535, SRR504534, SRR504533, SRR504532, SRR504531, SRR504481, SRR504480, SRR504479, SRR504478, SRR504477, SRR504476, SRR504475, SRR504474, SRR504473, SRR504472, SRR504471, SRR504470, SRR504469, SRR504468, SRR504467, SRR504466, SRR504465, SRR504464, SRR504463, SRR504462, SRR504371, SRR504370, SRR504369, SRR504368, SRR504367, SRR504366, SRR504365, SRR504364, SRR504363, SRR504362, SRR504361, SRR504360, SRR504341, SRR504187, SRR504186, SRR504185, SRR504184, SRR504183, SRR504182, SRR504181, SRR504180, SRR504179, SRR503605, SRR503604, SRR503603, SRR503602, SRR503601, SRR503600, SRR503433, SRR503432, SRR503431, SRR503430, SRR503429, SRR503428, SRR503427, SRR503426, SRR503425, SRR503424, SRR502782, SRR502781, SRR502780, SRR502779, SRR502778, SRR502777, SRR501623, SRR501622, SRR501621, SRR501620, SRR501619, SRR501618, SRR501617, SRR501616, SRR501615, SRR501614, SRR501613, SRR501612, SRR501611, SRR501610, SRR501609, SRR501608, SRR501607, SRR501606, SRR501605, SRR501604, SRR501603, SRR501602, SRR501601, SRR501600, SRR501599, SRR501598, SRR501597, SRR501596, SRR501595, SRR501594, SRR500874, SRR500513, SRR500512, SRR500511, SRR500510, SRR500509, SRR500508, SRR500507, SRR500506, SRR500505, SRR500504, SRR500475, SRR499412, SRR499411, SRR499410, SRR499409, SRR497903, SRR497902, SRR497901, SRR497900, SRR497899, SRR497898, SRR497897, SRR497896, SRR497895, SRR497894, SRR497893, SRR497892, SRR497889, SRR497888, SRR497641, SRR497640, SRR497639, SRR493746, SRR493745, SRR493744, SRR493743, SRR493742, SRR493741, SRR493740, SRR493091, SRR493090, SRR493089, SRR493088, SRR493087, SRR493086, SRR493085, SRR493084, SRR493083, SRR493082, SRR493047, SRR493046, SRR493045, SRR493044, SRR493043, SRR493042, SRR493041, SRR493040, SRR493039, SRR493038, SRR493037, SRR493036, SRR493035, SRR493034, SRR493033, SRR491308, SRR491307, SRR490840, SRR490839, SRR490104, SRR490103, SRR488781, SRR488780, SRR488779, SRR488778, SRR488777, SRR488776, SRR488775, SRR488774, SRR488773, SRR488772, SRR488771,

SRR488770, SRR479038, SRR479037, SRR479036, SRR479035, SRR479034, SRR479033, SRR479032, SRR479031, SRR479030, SRR478970, SRR478969, SRR478968, SRR478967, SRR478966, SRR478965, SRR478964, SRR477082, SRR477081, SRR477080, SRR477079, SRR477078, SRR477077, SRR477076, SRR477075, SRR475692, SRR475691, SRR475690, SRR475423, SRR475422, SRR473425, SRR473424, SRR473423, SRR473422, SRR458764, SRR458763, SRR458762, SRR458761, SRR452279, SRR452278, SRR452277, SRR452276, SRR452275, SRR452274, SRR449370, SRR449369, SRR449368, SRR449367, SRR449366, SRR449365, SRR449364, SRR449083, SRR449082, SRR449081, SRR449077, SRR449076, SRR447749, SRR447748, SRR447136, SRR447135, SRR447134, SRR447133, SRR447132, SRR447131, SRR447130, SRR447129, SRR447128, SRR447127, SRR447126, SRR447125, SRR447124, SRR447123, SRR447122, SRR447120, SRR447119, SRR447118, SRR447117, SRR446487, SRR446486, SRR446485, SRR446484, SRR445738, SRR445737, SRR445736, SRR445735, SRR445218, SRR445217, SRR445216, SRR445215, SRR445214, SRR445213, SRR445212, SRR445211, SRR445210, SRR445209, SRR445208, SRR445207, SRR445206, SRR445205, SRR445204, SRR444602, SRR444601, SRR444600, SRR444599, SRR444598, SRR444597, SRR444596, SRR444595, SRR443175, SRR443174, SRR443173, SRR443172, SRR443171, SRR443170, SRR443169, SRR443168, SRR443167, SRR443166, SRR443165, SRR443164, SRR443163, SRR442164, SRR442163, SRR442162, SRR442161, SRR441559, SRR441558, SRR441557, SRR441556, SRR441555, SRR441554, SRR441553, SRR441552, SRR441551, SRR441550, SRR441549, SRR441548, SRR441547, SRR441546, SRR441545, SRR441544, SRR441543, SRR441542, SRR441541, SRR441540, SRR441539, SRR441538, SRR441537, SRR441536, SRR441535, SRR441534, SRR441533, SRR441532, SRR441531, SRR441530, SRR441529, SRR441528, SRR441527, SRR441526, SRR441525, SRR435298, SRR435297, SRR435296, SRR435295, SRR427191, SRR427190, SRR427189, SRR427188, SRR427187, SRR427186, SRR427185, SRR427184, SRR427183, SRR426802, SRR426801, SRR426800, SRR426799, SRR424668, SRR424667, SRR419187, SRR419186, SRR419185, SRR419184, SRR419183, SRR419182, SRR41994, SRR41993, SRR41992, SRR41991, SRR41990, SRR41989, SRR41988, SRR41987, SRR41986, SRR41985, SRR41984, SRR41983, SRR41982, SRR413929, SRR413928, SRR413927, SRR413926, SRR413925, SRR413924, SRR413923, SRR408836, SRR408835, SRR408834, SRR408833, SRR408832, SRR408831, SRR408830, SRR408829, SRR408828, SRR408749, SRR408748, SRR408747, SRR408746, SRR408745, SRR408744, SRR408743, SRR408742, SRR408741, SRR408740, SRR408739, SRR408738, SRR408737, SRR408736, SRR408735, SRR408734, SRR408733, SRR408732, SRR408731, SRR408730, SRR408729, SRR408240, SRR404985, SRR404984, SRR404983, SRR404982, SRR404981, SRR404980, SRR404277, SRR404276, SRR404275, SRR404274, SRR403910, SRR403909, SRR403908, SRR403907, SRR403906, SRR403905, SRR403904, SRR403903, SRR403901, SRR403900, SRR403899, SRR403898, SRR403897, SRR403896, SRR403895, SRR403894, SRR402998, SRR402997, SRR402996, SRR402995, SRR402994, SRR402781, SRR402371, SRR402370, SRR402038, SRR402037, SRR402036, SRR402035, SRR402034, SRR402033, SRR402032, SRR402031, SRR402030, SRR402029, SRR402028, SRR402027, SRR402026, SRR402025, SRR402024, SRR402023, SRR402022, SRR402021, SRR402020, SRR402019, SRR401430, SRR401429, SRR401428, SRR401427,

SRR401426, SRR401425, SRR401424, SRR401423, SRR401422, SRR401421, SRR401420, SRR401419, SRR401418, SRR401417, SRR401416, SRR401415, SRR401414, SRR401413, SRR401391, SRR401390, SRR401323, SRR401322, SRR401321, SRR401320, SRR400885, SRR400884, SRR400883, SRR400882, SRR400600, SRR400599, SRR400598, SRR400597, SRR400035, SRR398012, SRR398011, SRR398010, SRR398009, SRR398007, SRR398006, SRR397772, SRR397771, SRR396679, SRR396678, SRR396617, SRR396616, SRR394319, SRR394318, SRR394317, SRR394316, SRR394315, SRR394314, SRR394313, SRR394312, SRR394082, SRR394075, SRR394063, SRR394062, SRR394061, SRR394060, SRR394059, SRR394058, SRR393996, SRR393793, SRR393792, SRR393791, SRR393790, SRR393789, SRR393788, SRR393787, SRR393786, SRR393785, SRR393784, SRR393783, SRR393782, SRR393781, SRR393780, SRR393779, SRR393778, SRR393777, SRR393776, SRR393775, SRR393774, SRR393773, SRR393772, SRR393771, SRR393770, SRR393769, SRR392837, SRR392836, SRR392145, SRR392144, SRR392143, SRR392142, SRR392141, SRR392140, SRR392139, SRR392138, SRR392137, SRR392136, SRR392135, SRR392134, SRR392133, SRR392132, SRR392131, SRR392130, SRR392129, SRR392128, SRR392127, SRR392126, SRR392125, SRR392124, SRR392123, SRR392122, SRR392121, SRR392120, SRR392119, SRR392118, SRR391539, SRR391538, SRR391537, SRR391052, SRR391051, SRR390741, SRR390740, SRR390314, SRR390313, SRR390312, SRR390311, SRR390310, SRR390309, SRR390308, SRR390307, SRR390306, SRR390305, SRR390304, SRR390303, SRR390302, SRR390296, SRR389192, SRR389191, SRR389190, SRR389189, SRR389188, SRR388670, SRR388669, SRR388668, SRR388667, SRR388666, SRR388665, SRR388157, SRR388156, SRR388155, SRR388154, SRR388153, SRR388152, SRR388151, SRR388150, SRR387837, SRR387836, SRR387835, SRR387834, SRR385619, SRR385618, SRR385617, SRR385616, SRR385615, SRR385614, SRR385613, SRR385612, SRR385611, SRR385610, SRR385609, SRR385608, SRR384899, SRR384898, SRR384897, SRR384896, SRR372711, SRR372701, SRR372700, SRR372699, SRR372609, SRR372608, SRR364806, SRR364805, SRR364497, SRR364496, SRR364470, SRR364469, SRR364468, SRR364467, SRR364466, SRR364465, SRR363979, SRR363978, SRR363977, SRR363124, SRR363123, SRR363122, SRR363121, SRR363120, SRR363119, SRR363118, SRR363117, SRR363116, SRR361462, SRR361461, SRR361460, SRR361459, SRR361458, SRR361457, SRR361418, SRR361417, SRR361416, SRR361415, SRR361414, SRR361413, SRR361412, SRR360390, SRR360389, SRR359289, SRR359288, SRR359287, SRR359286, SRR359285, SRR359284, SRR359283, SRR359282, SRR359281, SRR359280, SRR359279, SRR359278, SRR359277, SRR359276, SRR359275, SRR359274, SRR359269, SRR359259, SRR359258, SRR359257, SRR359206, SRR359169, SRR359117, SRR359116, SRR359115, SRR359114, SRR359112, SRR359111, SRR359107, SRR358902, SRR358901, SRR358900, SRR358899, SRR358798, SRR358797, SRR358796, SRR358795, SRR358794, SRR358793, SRR358792, SRR358791, SRR357420, SRR357419, SRR357418, SRR357417, SRR357409, SRR357408, SRR357407, SRR357246, SRR357245, SRR357228, SRR357227, SRR357226, SRR357225, SRR357224, SRR357223, SRR357222, SRR357221, SRR357220, SRR357219, SRR357218, SRR357217, SRR357216, SRR357215, SRR357214, SRR357213, SRR357212, SRR357211, SRR357210, SRR357209, SRR357208, SRR357207, SRR357206, SRR357205, SRR357204, SRR357203, SRR357202, SRR357201,

SRR357200, SRR357199, SRR357198, SRR354055, SRR354052, SRR353944, SRR353935, SRR353934, SRR353929, SRR353928, SRR353606, SRR353605, SRR352326, SRR352325, SRR352324, SRR352210, SRR352208, SRR352205, SRR352203, SRR352202, SRR352200, SRR352198, SRR352196, SRR352195, SRR351933, SRR351932, SRR351906, SRR351196, SRR351195, SRR349700, SRR349699, SRR349698, SRR349697, SRR346553, SRR346552, SRR345564, SRR345563, SRR345562, SRR345561, SRR345556, SRR345555, SRR345554, SRR345553, SRR345552, SRR345551, SRR343154, SRR343129, SRR343120, SRR342358, SRR342357, SRR342356, SRR342355, SRR342072, SRR342071, SRR342070, SRR342069, SRR342068, SRR342067, SRR342066, SRR342065, SRR342064, SRR342063, SRR342062, SRR342061, SRR342060, SRR342059, SRR342025, SRR332449, SRR332448, SRR332447, SRR332446, SRR332445, SRR332444, SRR332443, SRR332442, SRR332441, SRR332440, SRR332439, SRR332438, SRR332437, SRR332436, SRR331863, SRR331824, SRR331746, SRR331745, SRR331744, SRR331743, SRR331231, SRR331229, SRR331228, SRR331227, SRR330074, SRR326296, SRR326295, SRR326294, SRR326293, SRR326292, SRR326291, SRR326290, SRR326289, SRR326288, SRR326287, SRR326286, SRR326285, SRR324840, SRR324839, SRR324838, SRR324704, SRR324703, SRR324702, SRR324701, SRR324700, SRR324699, SRR324698, SRR324697, SRR324696, SRR324695, SRR324694, SRR324693, SRR324692, SRR324691, SRR324690, SRR324689, SRR317194, SRR317193, SRR317192, SRR316290, SRR316289, SRR316288, SRR316287, SRR316286, SRR316285, SRR316284, SRR316283, SRR316282, SRR316281, SRR316280, SRR316279, SRR316278, SRR316277, SRR316276, SRR316275, SRR316274, SRR316273, SRR315731, SRR315138, SRR315137, SRR315136, SRR315135, SRR315134, SRR315133, SRR315132, SRR315131, SRR314818, SRR314817, SRR314816, SRR314815, SRR314814, SRR314813, SRR309186, SRR309185, SRR309184, SRR309183, SRR309182, SRR309181, SRR309180, SRR309179, SRR309178, SRR309177, SRR309176, SRR309175, SRR309174, SRR309173, SRR309172, SRR309171, SRR309170, SRR309169, SRR309168, SRR309167, SRR309166, SRR309165, SRR309164, SRR309163, SRR309162, SRR309161, SRR309160, SRR309159, SRR309158, SRR309157, SRR309156, SRR309155, SRR309154, SRR309153, SRR309152, SRR309151, SRR309150, SRR309149, SRR309148, SRR309147, SRR309146, SRR309145, SRR307076, SRR307075, SRR307074, SRR307073, SRR307072, SRR307071, SRR307070, SRR307069, SRR307068, SRR307067, SRR306325, SRR306324, SRR306323, SRR306322, SRR306321, SRR306320, SRR306319, SRR306318, SRR306317, SRR306316, SRR299250, SRR299249, SRR299248, SRR299247, SRR299246, SRR299245, SRR299244, SRR299243, SRR299242, SRR299241, SRR299240, SRR299239, SRR299238, SRR299237, SRR299236, SRR299235, SRR299234, SRR299233, SRR299232, SRR299231, SRR299230, SRR299229, SRR299228, SRR299227, SRR299098, SRR299097, SRR299096, SRR299095, SRR299094, SRR299093, SRR299092, SRR299091, SRR299090, SRR299089, SRR299088, SRR299087, SRR299086, SRR284649, SRR284648, SRR284647, SRR284646, SRR284645, SRR284644, SRR284643, SRR284642, SRR284641, SRR284640, SRR275595, SRR275594, SRR275593, SRR275592, SRR275591, SRR275590, SRR275589, SRR275588, SRR275537, SRR275536, SRR252666, SRR252665, SRR252664, SRR243574, SRR243573, SRR243572, SRR214337, SRR210763, SRR203492, SRR203491, SRR203490, SRR203489, SRR203369, SRR203368, SRR203367, SRR203366,

SRR203365, SRR203364, SRR203363, SRR203362, SRR203361, SRR203360, SRR203359, SRR203358, SRR203357, SRR203356, SRR203355, SRR203354, SRR203353, SRR203352, SRR203351, SRR203346, SRR203345, SRR203344, SRR203343, SRR203342, SRR203341, SRR203340, SRR203339, SRR203338, SRR203337, SRR203275, SRR203039, SRR203038, SRR203037, SRR203036, SRR203035, SRR203034, SRR203033, SRR203032, SRR203031, SRR203030, SRR189813, SRR189812, SRR189811, SRR189810, SRR189809, SRR189808, SRR189807, SRR189806, SRR189805, SRR189804, SRR189803, SRR189802, SRR189801, SRR189800, SRR185818, SRR184104, SRR184103, SRR184102, SRR184101, SRR184100, SRR184099, SRR173046, SRR172849, SRR172848, SRR172847, SRR172846, SRR172845, SRR172844, SRR167711, SRR167710, SRR167709, SRR167708, SRR167707, SRR167706, SRR167705, SRR167704, SRR167696, SRR137920, SRR137919, SRR133522, SRR133521, SRR133520, SRR133519, SRR133518, SRR133517, SRR124138, SRR124132, SRR124131, SRR124130, SRR124127, SRR124126, SRR124121, SRR122261, SRR122260, SRR122259, SRR122258, SRR122257, SRR122256, SRR122254, SRR122253, SRR122252, SRR122251, SRR122250, SRR122249, SRR122248, SRR122247, SRR122246, SRR122245, SRR122244, SRR122243, SRR122242, SRR122241, SRR122240, SRR122239, SRR122238, SRR122237, SRR122236, SRR122140, SRR122139, SRR122138, SRR122137, SRR122136, SRR122135, SRR122134, SRR122133, SRR122132, SRR122131, SRR122130, SRR122129, SRR122128, SRR122127, SRR122126, SRR122125, SRR122124, SRR122123, SRR122122, SRR122121, SRR122120, SRR122119, SRR122118, SRR122117, SRR122116, SRR122115, SRR122114, SRR122113, SRR122112, SRR122111, SRR122110, SRR122109, SRR122108, SRR121623, SRR121622, SRR101432, SRR101431, SRR101430, SRR101429, SRR101428, SRR101427, SRR100216, SRR100215, SRR100214, SRR100213, SRR100212, SRR100211, SRR100210, SRR100209, SRR098329, SRR098328, SRR096799, SRR096798, SRR096797, SRR096796, SRR096795, SRR096520, SRR096519, SRR096518, SRR096517, SRR096516, SRR096515, SRR096514, SRR096513, SRR096512, SRR096511, SRR096510, SRR096509, SRR096508, SRR096507, SRR096506, SRR096505, SRR096504, SRR096503, SRR096502, SRR096501, SRR096500, SRR096499, SRR096498, SRR096497, SRR096496, SRR096495, SRR096494, SRR096493, SRR096444, SRR096443, SRR094956, SRR094955, SRR094954, SRR094953, SRR094952, SRR094951, SRR094178, SRR094177, SRR094176, SRR094175, SRR094174, SRR094068, SRR094067, SRR094066, SRR094065, SRR094064, SRR094063, SRR094062, SRR094060, SRR094059, SRR094058, SRR091645, SRR091644, SRR091643, SRR091642, SRR091641, SRR091640, SRR091639, SRR091638, SRR091637, SRR091636, SRR091635, SRR090221, SRR090220, SRR090219, SRR090218, SRR089777, SRR089776, SRR089775, SRR089774, SRR089773, SRR089772, SRR089763, SRR089762, SRR089625, SRR089624, SRR089623, SRR089622, SRR089621, SRR089620, SRR089619, SRR089618, SRR089617, SRR089616, SRR089615, SRR089373, SRR089372, SRR089371, SRR089370, SRR088878, SRR088877, SRR088875, SRR088874, SRR085459, SRR085458, SRR085457, SRR085456, SRR085455, SRR085454, SRR085453, SRR080723, SRR080722, SRR080704, SRR080703, SRR077259, SRR077258, SRR074358, SRR074357, SRR074305, SRR074304, SRR074303, SRR074302, SRR074301, SRR074286, SRR074171, SRR074170, SRR074169, SRR074168, SRR074167, SRR074166, SRR074165, SRR074164, SRR074163, SRR074162, SRR074161,

SRR074160, SRR074159, SRR074158, SRR074157, SRR074156, SRR074155, SRR074154, SRR074153, SRR074152, SRR074151, SRR074150, SRR074149, SRR074148, SRR074147, SRR074146, SRR074145, SRR074144, SRR074143, SRR074142, SRR074141, SRR074140, SRR074139, SRR074138, SRR074137, SRR074136, SRR074135, SRR074134, SRR074133, SRR074132, SRR074131, SRR074130, SRR074129, SRR074128, SRR074127, SRR074126, SRR074125, SRR074123, SRR074122, SRR074121, SRR074120, SRR074119, SRR072964, SRR072963, SRR072962, SRR072961, SRR072960, SRR072959, SRR072958, SRR072957, SRR072919, SRR072918, SRR072917, SRR072809, SRR072808, SRR072807, SRR072806, SRR070692, SRR070691, SRR070690, SRR070689, SRR070573, SRR070572, SRR070571, SRR070570, SRR069603, SRR069574, SRR069573, SRR069572, SRR069571, SRR069570, SRR069569, SRR069568, SRR069567, SRR069566, SRR069565, SRR069564, SRR069563, SRR069562, SRR069561, SRR069560, SRR069559, SRR069558, SRR069557, SRR069556, SRR068990, SRR068989, SRR068988, SRR068987, SRR068986, SRR068985, SRR068984, SRR068983, SRR068982, SRR068981, SRR068980, SRR068979, SRR068978, SRR068977, SRR068976, SRR068975, SRR068974, SRR068973, SRR068972, SRR068971, SRR068970, SRR068969, SRR068968, SRR068967, SRR068966, SRR068965, SRR068964, SRR068963, SRR068962, SRR068961, SRR068960, SRR068959, SRR068958, SRR068957, SRR068956, SRR068926, SRR066648, SRR066647, SRR066646, SRR066645, SRR066644, SRR066643, SRR066641, SRR066640, SRR066638, SRR065173, SRR065172, SRR065171, SRR065170, SRR065169, SRR065168, SRR065167, SRR065166, SRR065165, SRR065164, SRR065163, SRR065162, SRR065161, SRR065160, SRR065159, SRR065158, SRR065157, SRR065156, SRR064983, SRR064982, SRR064981, SRR064980, SRR064979, SRR063686, SRR063685, SRR063684, SRR063683, SRR063682, SRR063681, SRR063680, SRR063679, SRR063678, SRR063677, SRR063676, SRR062266, SRR062265, SRR062124, SRR062123, SRR062122, SRR062121, SRR062120, SRR062119, SRR062118, SRR062117, SRR062116, SRR062115, SRR062114, SRR062113, SRR062112, SRR062111, SRR062110, SRR060846, SRR060806, SRR058906, SRR058827, SRR058535, SRR058534, SRR058533, SRR058532, SRR058531, SRR058530, SRR058529, SRR058528, SRR058527, SRR058526, SRR058438, SRR058437, SRR058436, SRR058435, SRR057539, SRR057538, SRR057537, SRR057536, SRR057535, SRR057485, SRR057484, SRR057483, SRR057406, SRR051927, SRR051926, SRR043419, SRR043418, SRR043417, SRR043416, SRR042536, SRR042535, SRR042532, SRR042529, SRR040402, SRR040401, SRR039972, SRR039971, SRR039970, SRR039969, SRR039968, SRR039929, SRR039928, SRR039927, SRR039926, SRR039925, SRR039924, SRR039923, SRR039922, SRR039921, SRR039920, SRR039906, SRR039905, SRR039904, SRR039903, SRR039902, SRR039885, SRR039884, SRR039826, SRR039825, SRR039720, SRR039719, SRR039718, SRR039717, SRR039716, SRR039714, SRR039713, SRR039712, SRR039711, SRR039679, SRR039678, SRR039677, SRR039676, SRR039675, SRR039674, SRR039673, SRR039672, SRR039671, SRR039670, SRR039669, SRR039514, SRR039512, SRR039510, SRR039509, SRR039508, SRR039507, SRR039506, SRR039505, SRR039504, SRR039503, SRR039502, SRR039501, SRR038988, SRR038987, SRR038986, SRR038985, SRR038867, SRR038866, SRR038865, SRR038864, SRR037746, SRR037745, SRR037744, SRR037743, SRR037742, SRR037741, SRR037740, SRR037739, SRR037738, SRR037737, SRR037736,

SRR037735, SRR037734, SRR037733, SRR037732, SRR037731, SRR037730, SRR037729, SRR037728, SRR037727, SRR037726, SRR037725, SRR037724, SRR037723, SRR037722, SRR037721, SRR037720, SRR037719, SRR037718, SRR037717, SRR037716, SRR037715, SRR037714, SRR037713, SRR037712, SRR037711, SRR037686, SRR037685, SRR037684, SRR037683, SRR037682, SRR037681, SRR037680, SRR037679, SRR037678, SRR037677, SRR037676, SRR037675, SRR037674, SRR037673, SRR037672, SRR037671, SRR037670, SRR037669, SRR037668, SRR037667, SRR037666, SRR037665, SRR037664, SRR037663, SRR037662, SRR037661, SRR037660, SRR037659, SRR037658, SRR037657, SRR037656, SRR037655, SRR037654, SRR037653, SRR037238, SRR037237, SRR037236, SRR037235, SRR037234, SRR037233, SRR037232, SRR036641, SRR036640, SRR036392, SRR036391, SRR035616, SRR035258, SRR035257, SRR035256, SRR035255, SRR035254, SRR035253, SRR035252, SRR035251, SRR035250, SRR035249, SRR035248, SRR035247, SRR035246, SRR035245, SRR035228, SRR035227, SRR035226, SRR035185, SRR035184, SRR035183, SRR035182, SRR034983, SRR034981, SRR034976, SRR034856, SRR034611, SRR034610, SRR034609, SRR034608, SRR034607, SRR034606, SRR034605, SRR034604, SRR034603, SRR034602, SRR034601, SRR034600, SRR034599, SRR034598, SRR034597, SRR034596, SRR034595, SRR034594, SRR034593, SRR034592, SRR034591, SRR034590, SRR034589, SRR034588, SRR034587, SRR034586, SRR034585, SRR034584, SRR034583, SRR034582, SRR034581, SRR034580, SRR034462, SRR034219, SRR034218, SRR034217, SRR034216, SRR034215, SRR034214, SRR034102, SRR034098, SRR034097, SRR034096, SRR032115, SRR032114, SRR032113, SRR032112, SRR032102, SRR032101, SRR032100, SRR032099, SRR032098, SRR032097, SRR032091, SRR032090, SRR032089, SRR032088, SRR032087, SRR032086, SRR032085, SRR032084, SRR032083, SRR031088, SRR031087, SRR029635, SRR029634, SRR029384, SRR029383, SRR029382, SRR029381, SRR029380, SRR029379, SRR029378, SRR029377, SRR029376, SRR029375, SRR029374, SRR029373, SRR029372, SRR029371, SRR029370, SRR029369, SRR029229, SRR029228, SRR029191, SRR029190, SRR029189, SRR029188, SRR029187, SRR029186, SRR029185, SRR029184, SRR029183, SRR029182, SRR029181, SRR029180, SRR029179, SRR029178, SRR029177, SRR029158, SRR029157, SRR027951, SRR027950, SRR020798, SRR020797, SRR019213, SRR019212, SRR019211, SRR019210, SRR019209, SRR019208, SRR019207, SRR019206, SRR019205, SRR019187, SRR019186, SRR019185, SRR019181, SRR019180, SRR019179, SRR019035, SRR018347, SRR018346, ERR990520, ERR990519, ERR990518, ERR990517, ERR990516, ERR990515, ERR990514, ERR990513, ERR990512, ERR990511, ERR990510, ERR990509, ERR990508, ERR990507, ERR990506, ERR990505, ERR990504, ERR990503, ERR990502, ERR990501, ERR990500, ERR990499, ERR990498, ERR990497, ERR990496, ERR990495, ERR990494, ERR990493, ERR990492, ERR990491, ERR990490, ERR990489, ERR990488, ERR990487, ERR990486, ERR990485, ERR990484, ERR990483, ERR990482, ERR990481, ERR990480, ERR990479, ERR990478, ERR990477, ERR990476, ERR990475, ERR990474, ERR990473, ERR990472, ERR990471, ERR990470, ERR990469, ERR990468, ERR990467, ERR990466, ERR990465, ERR990464, ERR990463, ERR990462, ERR990461, ERR990460, ERR990459, ERR990458, ERR990457, ERR990456, ERR990455, ERR990454, ERR990453, ERR990452, ERR990451, ERR990450, ERR990449, ERR990448, ERR990447, ERR990446,

ERR990445, ERR990444, ERR990443, ERR990442, ERR990441, ERR990440, ERR990439,
ERR990438, ERR990437, ERR990436, ERR990435, ERR990434, ERR985521, ERR985520,
ERR985519, ERR985518, ERR985517, ERR985516, ERR985515, ERR985514, ERR985513,
ERR985512, ERR985511, ERR985510, ERR985509, ERR985508, ERR985507, ERR985506,
ERR985505, ERR985504, ERR980770, ERR980769, ERR980768, ERR980767, ERR980766,
ERR980765, ERR980764, ERR980763, ERR980762, ERR980761, ERR980760, ERR980759,
ERR980758, ERR980757, ERR980756, ERR980755, ERR980754, ERR980753, ERR980752,
ERR980751, ERR980750, ERR980749, ERR980748, ERR980747, ERR977778, ERR977777,
ERR977776, ERR977775, ERR977774, ERR977773, ERR977772, ERR977771, ERR977770,
ERR977769, ERR977768, ERR977767, ERR977766, ERR977765, ERR977764, ERR977763,
ERR977762, ERR977761, ERR977760, ERR977759, ERR977758, ERR977757, ERR977756,
ERR977755, ERR977754, ERR977753, ERR977752, ERR977751, ERR977750, ERR977749,
ERR977748, ERR977747, ERR977746, ERR977745, ERR977744, ERR977743, ERR977742,
ERR977741, ERR977740, ERR977739, ERR977738, ERR977737, ERR977736, ERR977735,
ERR977734, ERR977733, ERR977732, ERR977731, ERR977730, ERR977729, ERR977728,
ERR977727, ERR977726, ERR977725, ERR977724, ERR977723, ERR977722, ERR977721,
ERR977720, ERR977719, ERR977718, ERR977717, ERR977716, ERR977715, ERR977714,
ERR977713, ERR977712, ERR977711, ERR977710, ERR977709, ERR977708, ERR977707,
ERR977706, ERR977705, ERR977704, ERR977703, ERR977702, ERR977701, ERR977700,
ERR977699, ERR977698, ERR977697, ERR977696, ERR977695, ERR977694, ERR977693,
ERR977692, ERR977691, ERR977690, ERR977689, ERR977688, ERR977687, ERR977686,
ERR977685, ERR977684, ERR977683, ERR977682, ERR977681, ERR977680, ERR977679,
ERR977678, ERR977677, ERR977676, ERR977675, ERR977674, ERR977673, ERR977672,
ERR977671, ERR977670, ERR977669, ERR977668, ERR977667, ERR977666, ERR977665,
ERR977664, ERR977663, ERR977662, ERR977661, ERR977660, ERR977659, ERR977658,
ERR977657, ERR977656, ERR977655, ERR977654, ERR977653, ERR977652, ERR977651,
ERR977650, ERR977649, ERR977648, ERR977647, ERR977646, ERR977645, ERR977644,
ERR977643, ERR977642, ERR977641, ERR977640, ERR977639, ERR977638, ERR977637,
ERR977636, ERR977635, ERR977634, ERR977633, ERR977632, ERR977631, ERR977630,
ERR977629, ERR977628, ERR977627, ERR977626, ERR977625, ERR977624, ERR977623,
ERR977622, ERR977621, ERR977620, ERR977619, ERR977618, ERR977617, ERR977616,
ERR977615, ERR977614, ERR977613, ERR977612, ERR977611, ERR977610, ERR977609,
ERR977608, ERR977607, ERR977606, ERR977605, ERR977604, ERR977603, ERR977602,
ERR977601, ERR977600, ERR977599, ERR977598, ERR977597, ERR977596, ERR977595,
ERR976998, ERR976793, ERR973589, ERR973588, ERR973587, ERR973586, ERR973585,
ERR973584, ERR973583, ERR973582, ERR973581, ERR973580, ERR973579, ERR973578,
ERR973577, ERR973576, ERR973575, ERR973574, ERR973573, ERR973572, ERR973030,
ERR973029, ERR973028, ERR973027, ERR973026, ERR973025, ERR973024, ERR973023,
ERR968677, ERR968676, ERR968675, ERR968674, ERR968673, ERR968672, ERR966168,
ERR966167, ERR966166, ERR966165, ERR966164, ERR966163, ERR966162, ERR966161,
ERR966160, ERR966159, ERR966158, ERR966157, ERR966153, ERR966151, ERR966150,
ERR966149, ERR966148, ERR965668, ERR965667, ERR965666, ERR965665, ERR965664,

ERR965663, ERR965662, ERR965661, ERR965660, ERR965659, ERR965658, ERR965657,
ERR965656, ERR965655, ERR965654, ERR965653, ERR965652, ERR965651, ERR965650,
ERR965649, ERR965648, ERR965647, ERR965646, ERR965645, ERR965644, ERR965643,
ERR965642, ERR965641, ERR965640, ERR965639, ERR965638, ERR965637, ERR965636,
ERR965635, ERR965634, ERR965633, ERR965632, ERR965631, ERR965630, ERR965629,
ERR965628, ERR965627, ERR965626, ERR965625, ERR965624, ERR965623, ERR965622,
ERR965621, ERR965620, ERR965619, ERR965618, ERR965617, ERR965616, ERR965615,
ERR965614, ERR965613, ERR965612, ERR965611, ERR965610, ERR965609, ERR965608,
ERR965607, ERR965606, ERR965605, ERR965604, ERR965603, ERR965602, ERR965601,
ERR965600, ERR965599, ERR965598, ERR965597, ERR965596, ERR965595, ERR965594,
ERR965593, ERR965592, ERR965591, ERR965590, ERR965589, ERR965588, ERR965587,
ERR965586, ERR965585, ERR965584, ERR965583, ERR965582, ERR965581, ERR965580,
ERR965579, ERR965578, ERR965577, ERR965576, ERR965575, ERR965574, ERR965573,
ERR965572, ERR965571, ERR965570, ERR965569, ERR965568, ERR965567, ERR965566,
ERR965565, ERR965564, ERR965563, ERR965562, ERR965561, ERR951859, ERR951858,
ERR951857, ERR951856, ERR951855, ERR951854, ERR951853, ERR951852, ERR951851,
ERR951850, ERR951849, ERR951848, ERR951847, ERR951846, ERR951845, ERR951844,
ERR951843, ERR951842, ERR951841, ERR951840, ERR951839, ERR951838, ERR951837,
ERR951836, ERR951835, ERR951834, ERR951833, ERR951832, ERR951831, ERR951830,
ERR951829, ERR951828, ERR951827, ERR951826, ERR951825, ERR951824, ERR951823,
ERR951822, ERR951821, ERR951820, ERR951819, ERR951818, ERR951817, ERR951816,
ERR951815, ERR951814, ERR951813, ERR950226, ERR950225, ERR929883, ERR929882,
ERR929881, ERR929880, ERR929877, ERR929876, ERR929873, ERR929872, ERR929871,
ERR929870, ERR926756, ERR923384, ERR923264, ERR922633, ERR922632, ERR922631,
ERR922630, ERR922629, ERR922628, ERR922627, ERR922048, ERR922047, ERR922046,
ERR922045, ERR922044, ERR922043, ERR922042, ERR922041, ERR922040, ERR922039,
ERR922038, ERR922037, ERR922036, ERR922035, ERR922034, ERR922033, ERR922032,
ERR911846, ERR911845, ERR911844, ERR911843, ERR911842, ERR911841, ERR908491,
ERR908490, ERR908414, ERR908413, ERR908412, ERR908411, ERR908409, ERR908408,
ERR908407, ERR908406, ERR908405, ERR908404, ERR908402, ERR908401, ERR908400,
ERR908399, ERR908398, ERR908397, ERR908396, ERR908394, ERR908393, ERR908391,
ERR908390, ERR906804, ERR906803, ERR906802, ERR903963, ERR903958, ERR903954,
ERR903950, ERR903948, ERR903945, ERR903942, ERR903941, ERR902091, ERR902090,
ERR902089, ERR902088, ERR902087, ERR902086, ERR886716, ERR884055, ERR884054,
ERR884053, ERR884052, ERR884051, ERR884050, ERR884049, ERR884048, ERR884047,
ERR879072, ERR879071, ERR879070, ERR879069, ERR879068, ERR879067, ERR879066,
ERR879065, ERR879064, ERR879063, ERR879062, ERR879061, ERR879060, ERR879059,
ERR879058, ERR879057, ERR873460, ERR873459, ERR865500, ERR865499, ERR865498,
ERR865497, ERR865496, ERR865495, ERR865494, ERR865493, ERR865492, ERR863803,
ERR863802, ERR863801, ERR863800, ERR863799, ERR863798, ERR860870, ERR860869,
ERR860868, ERR860867, ERR860866, ERR860865, ERR860864, ERR860863, ERR860862,
ERR860861, ERR860860, ERR860859, ERR860858, ERR860857, ERR860856, ERR860855,

ERR855948, ERR855947, ERR855946, ERR855945, ERR855849, ERR855848, ERR855847,
ERR855792, ERR855791, ERR855790, ERR855506, ERR855505, ERR855504, ERR855503,
ERR855502, ERR855501, ERR850844, ERR850843, ERR850842, ERR850841, ERR829320,
ERR829319, ERR829318, ERR829317, ERR829316, ERR829315, ERR829314, ERR829313,
ERR829312, ERR829311, ERR829310, ERR829309, ERR829308, ERR829307, ERR829306,
ERR829305, ERR829304, ERR829303, ERR829302, ERR829301, ERR829300, ERR829299,
ERR829298, ERR829297, ERR829296, ERR829295, ERR829293, ERR829292, ERR829291,
ERR829290, ERR829289, ERR829288, ERR829287, ERR829286, ERR829285, ERR829284,
ERR829283, ERR829282, ERR829281, ERR829280, ERR829279, ERR829278, ERR829277,
ERR829276, ERR829275, ERR829274, ERR829273, ERR793025, ERR793024, ERR791778,
ERR791777, ERR791776, ERR791775, ERR791774, ERR791773, ERR791772, ERR791771,
ERR791770, ERR791769, ERR791768, ERR791767, ERR789955, ERR789945, ERR789555,
ERR789554, ERR789553, ERR789552, ERR789550, ERR789549, ERR789548, ERR789547,
ERR789546, ERR789116, ERR789115, ERR789114, ERR789113, ERR789112, ERR789111,
ERR789110, ERR789109, ERR789108, ERR789107, ERR789106, ERR789105, ERR789104,
ERR789103, ERR789102, ERR789101, ERR789100, ERR789099, ERR789098, ERR789097,
ERR789096, ERR789095, ERR789094, ERR789093, ERR789092, ERR789091, ERR789090,
ERR789089, ERR789088, ERR789087, ERR789070, ERR789069, ERR789068, ERR781085,
ERR781084, ERR781083, ERR781082, ERR781081, ERR781080, ERR781079, ERR781078,
ERR781077, ERR781076, ERR781075, ERR781074, ERR781073, ERR781072, ERR781071,
ERR781070, ERR781069, ERR781068, ERR781067, ERR781066, ERR781065, ERR781064,
ERR781063, ERR781062, ERR781061, ERR781060, ERR781059, ERR781058, ERR781057,
ERR781056, ERR781055, ERR781054, ERR781053, ERR781052, ERR781051, ERR781050,
ERR781049, ERR781048, ERR781047, ERR781046, ERR781045, ERR781044, ERR781043,
ERR781042, ERR781041, ERR781040, ERR781039, ERR777833, ERR777832, ERR777831,
ERR777830, ERR777829, ERR777828, ERR777825, ERR777824, ERR777823, ERR777822,
ERR776812, ERR776803, ERR776780, ERR776775, ERR776774, ERR776773, ERR776772,
ERR776771, ERR776131, ERR776130, ERR776129, ERR776128, ERR776127, ERR776126,
ERR776125, ERR776124, ERR776123, ERR776122, ERR776121, ERR776120, ERR776119,
ERR776118, ERR776117, ERR776116, ERR768567, ERR760730, ERR760729, ERR760728,
ERR760727, ERR760726, ERR760725, ERR760724, ERR760723, ERR760722, ERR760721,
ERR760720, ERR760719, ERR760718, ERR760717, ERR760716, ERR754090, ERR754089,
ERR754088, ERR754087, ERR754086, ERR754085, ERR754084, ERR754083, ERR754082,
ERR754081, ERR754080, ERR754079, ERR754078, ERR754077, ERR754076, ERR754075,
ERR754074, ERR754073, ERR754072, ERR754071, ERR754070, ERR754069, ERR754068,
ERR754067, ERR754066, ERR754065, ERR754064, ERR754063, ERR754062, ERR754061,
ERR754060, ERR754059, ERR754058, ERR754057, ERR754056, ERR754055, ERR754054,
ERR754053, ERR753939, ERR753938, ERR753937, ERR753936, ERR753935, ERR753934,
ERR753933, ERR753932, ERR753931, ERR753538, ERR753537, ERR753536, ERR753535,
ERR753534, ERR753533, ERR753532, ERR748791, ERR748790, ERR748789, ERR748788,
ERR748787, ERR748786, ERR748782, ERR748781, ERR748780, ERR748779, ERR748778,
ERR748776, ERR748775, ERR747962, ERR712367, ERR712366, ERR712365, ERR712364,

ERR712363, ERR712362, ERR712361, ERR712360, ERR712359, ERR712358, ERR712357, ERR712356, ERR712355, ERR712354, ERR712353, ERR712352, ERR712351, ERR712350, ERR706866, ERR706865, ERR706864, ERR706863, ERR706862, ERR706861, ERR706860, ERR706859, ERR706858, ERR706857, ERR706856, ERR706855, ERR706854, ERR706853, ERR706852, ERR706851, ERR706850, ERR706849, ERR706848, ERR706847, ERR706846, ERR706845, ERR706844, ERR706843, ERR706842, ERR706841, ERR706840, ERR706839, ERR706838, ERR706837, ERR706836, ERR706835, ERR706834, ERR706833, ERR706832, ERR706831, ERR706830, ERR706829, ERR706828, ERR706827, ERR706826, ERR706825, ERR706824, ERR706823, ERR706822, ERR706821, ERR706820, ERR706819, ERR706818, ERR706817, ERR706816, ERR706815, ERR706814, ERR706813, ERR706812, ERR706811, ERR706810, ERR706809, ERR706808, ERR706807, ERR706806, ERR706805, ERR706804, ERR706803, ERR706802, ERR706801, ERR706800, ERR706799, ERR706798, ERR706797, ERR706796, ERR706795, ERR706794, ERR706793, ERR706792, ERR705759, ERR701618, ERR701340, ERR701339, ERR701179, ERR701178, ERR701177, ERR690824, ERR690379, ERR690378, ERR690377, ERR690376, ERR690375, ERR690374, ERR688357, ERR688340, ERR688339, ERR688338, ERR688337, ERR688336, ERR688335, ERR687920, ERR687919, ERR687918, ERR687917, ERR687916, ERR687915, ERR687914, ERR687913, ERR687912, ERR687911, ERR687910, ERR687909, ERR687908, ERR687907, ERR687906, ERR687905, ERR687904, ERR687902, ERR687899, ERR687869, ERR687868, ERR687867, ERR687866, ERR687865, ERR687864, ERR687863, ERR687862, ERR687861, ERR687857, ERR687856, ERR674200, ERR674199, ERR674198, ERR674197, ERR674196, ERR674195, ERR674194, ERR674193, ERR674192, ERR674191, ERR674190, ERR674189, ERR674188, ERR674187, ERR674186, ERR674185, ERR674184, ERR670169, ERR670168, ERR670167, ERR670166, ERR670165, ERR670164, ERR670163, ERR670162, ERR670161, ERR668878, ERR668877, ERR668876, ERR668875, ERR668874, ERR668873, ERR668872, ERR668871, ERR668870, ERR668869, ERR668868, ERR668867, ERR668866, ERR668865, ERR668864, ERR668863, ERR668862, ERR668861, ERR668860, ERR668859, ERR668858, ERR668857, ERR668856, ERR668855, ERR668854, ERR668853, ERR668852, ERR668851, ERR668850, ERR668849, ERR668848, ERR668847, ERR668846, ERR668845, ERR668844, ERR668843, ERR668842, ERR668841, ERR668840, ERR668839, ERR668838, ERR668837, ERR668836, ERR668835, ERR668834, ERR668833, ERR668832, ERR668831, ERR668830, ERR668829, ERR668828, ERR668827, ERR668826, ERR668825, ERR668824, ERR668823, ERR668822, ERR668821, ERR668820, ERR668819, ERR668818, ERR668817, ERR668816, ERR668815, ERR668814, ERR668813, ERR668812, ERR668811, ERR668810, ERR668809, ERR668808, ERR668807, ERR668806, ERR668805, ERR668804, ERR668803, ERR668802, ERR668801, ERR668800, ERR668799, ERR668798, ERR668797, ERR668796, ERR668795, ERR668794, ERR668793, ERR668792, ERR668791, ERR668790, ERR668789, ERR668788, ERR668787, ERR668786, ERR668785, ERR668784, ERR668783, ERR668782, ERR668781, ERR668780, ERR668779, ERR668778, ERR668777, ERR668776, ERR668775, ERR668774, ERR668773, ERR668772, ERR668771, ERR668770, ERR668769, ERR668768, ERR668767, ERR668766, ERR668765, ERR668764, ERR668763, ERR668762, ERR668761, ERR668760, ERR668759, ERR668758, ERR668757, ERR668756, ERR668755, ERR668754, ERR668753, ERR668752, ERR668751,

ERR668750, ERR668749, ERR668748, ERR662030, ERR662029, ERR662028, ERR662027, ERR662026, ERR662025, ERR662024, ERR654975, ERR654974, ERR654973, ERR654972, ERR654971, ERR654970, ERR654969, ERR654968, ERR654486, ERR654485, ERR654484, ERR654483, ERR654482, ERR654481, ERR654480, ERR654479, ERR654478, ERR654477, ERR654476, ERR654475, ERR654474, ERR654473, ERR654472, ERR654471, ERR654470, ERR654469, ERR654468, ERR654467, ERR654466, ERR654465, ERR654464, ERR654463, ERR651403, ERR651402, ERR651401, ERR651400, ERR651399, ERR651398, ERR651397, ERR651396, ERR651395, ERR651394, ERR651393, ERR651392, ERR651391, ERR651390, ERR651389, ERR634926, ERR634925, ERR634924, ERR628387, ERR628386, ERR628385, ERR628384, ERR601608, ERR601607, ERR588049, ERR588048, ERR588047, ERR588046, ERR588045, ERR588044, ERR588043, ERR588042, ERR588041, ERR588040, ERR588039, ERR588038, ERR578471, ERR578470, ERR578469, ERR578468, ERR578467, ERR578466, ERR578465, ERR578464, ERR578463, ERR578462, ERR578461, ERR578460, ERR578459, ERR578458, ERR578457, ERR578456, ERR578455, ERR578454, ERR578453, ERR578452, ERR572030, ERR572029, ERR572028, ERR572027, ERR572026, ERR572025, ERR572024, ERR572023, ERR572022, ERR572021, ERR572020, ERR572019, ERR572018, ERR572017, ERR572016, ERR572015, ERR572014, ERR572013, ERR572012, ERR572011, ERR572010, ERR572009, ERR572008, ERR572007, ERR569785, ERR569784, ERR569783, ERR569782, ERR569781, ERR569780, ERR569779, ERR569778, ERR569777, ERR569776, ERR569775, ERR569774, ERR569773, ERR569772, ERR569771, ERR569770, ERR569769, ERR569768, ERR569767, ERR569766, ERR569765, ERR569764, ERR569763, ERR569762, ERR569761, ERR569760, ERR569759, ERR569758, ERR569757, ERR569756, ERR569755, ERR569754, ERR565717, ERR565716, ERR562748, ERR562746, ERR562745, ERR562742, ERR562741, ERR562740, ERR562739, ERR562737, ERR562735, ERR562734, ERR562733, ERR562732, ERR562731, ERR558160, ERR558159, ERR558158, ERR558157, ERR558156, ERR558155, ERR558154, ERR558153, ERR556933, ERR556932, ERR556931, ERR556930, ERR556929, ERR556928, ERR556927, ERR556926, ERR556925, ERR556924, ERR556923, ERR556922, ERR556921, ERR556920, ERR556919, ERR556918, ERR556917, ERR556916, ERR556915, ERR556914, ERR556913, ERR556912, ERR556911, ERR556910, ERR556909, ERR556908, ERR556907, ERR556906, ERR556905, ERR556904, ERR556903, ERR556902, ERR556901, ERR544042, ERR544041, ERR544040, ERR544039, ERR544038, ERR544037, ERR544036, ERR544035, ERR544034, ERR544033, ERR544022, ERR544021, ERR544020, ERR544019, ERR544018, ERR544017, ERR544016, ERR544015, ERR544014, ERR544013, ERR544012, ERR544011, ERR544010, ERR544009, ERR544008, ERR544007, ERR544006, ERR544005, ERR544004, ERR544003, ERR544002, ERR544001, ERR544000, ERR543999, ERR543998, ERR543997, ERR543996, ERR543995, ERR543994, ERR543989, ERR543988, ERR543987, ERR543986, ERR543985, ERR543984, ERR543983, ERR543982, ERR543981, ERR543980, ERR543979, ERR543978, ERR543977, ERR543976, ERR543975, ERR543974, ERR543973, ERR543972, ERR543971, ERR543970, ERR543969, ERR543968, ERR543967, ERR543966, ERR543965, ERR543964, ERR543963, ERR543962, ERR543961, ERR543960, ERR543959, ERR543958, ERR541390, ERR541389, ERR541388, ERR541387, ERR526259, ERR526258, ERR526257, ERR526256, ERR526255, ERR526254, ERR526253, ERR526252, ERR526251,

ERR526250, ERR526249, ERR526248, ERR526247, ERR526246, ERR526245, ERR526244, ERR526243, ERR526242, ERR526241, ERR526240, ERR526239, ERR526238, ERR526237, ERR526236, ERR526235, ERR526234, ERR526233, ERR526232, ERR526231, ERR526230, ERR526229, ERR526228, ERR526227, ERR526226, ERR526225, ERR526224, ERR526223, ERR526222, ERR526221, ERR526220, ERR526219, ERR526218, ERR526217, ERR526216, ERR526215, ERR526214, ERR526213, ERR526212, ERR506763, ERR506762, ERR506761, ERR506760, ERR506759, ERR506758, ERR506757, ERR506756, ERR506755, ERR506754, ERR506753, ERR506752, ERR505243, ERR505242, ERR505241, ERR504714, ERR504713, ERR504712, ERR504711, ERR504710, ERR504709, ERR504708, ERR504707, ERR498070, ERR498069, ERR498068, ERR498067, ERR498066, ERR498065, ERR498064, ERR498063, ERR498062, ERR498061, ERR498060, ERR498059, ERR498058, ERR498057, ERR498056, ERR498055, ERR498054, ERR498053, ERR498052, ERR498051, ERR498050, ERR498049, ERR498048, ERR498047, ERR498046, ERR498045, ERR498044, ERR498043, ERR498042, ERR498041, ERR498040, ERR493820, ERR493433, ERR493432, ERR493431, ERR493430, ERR493429, ERR493428, ERR493372, ERR490207, ERR490206, ERR490205, ERR490204, ERR490203, ERR490202, ERR490201, ERR477405, ERR477404, ERR476706, ERR476705, ERR476704, ERR476703, ERR476702, ERR476696, ERR476695, ERR476694, ERR476693, ERR476692, ERR476691, ERR476690, ERR476689, ERR476688, ERR476687, ERR476686, ERR476685, ERR476684, ERR476683, ERR476682, ERR476681, ERR476680, ERR476679, ERR476678, ERR476677, ERR476676, ERR476675, ERR476674, ERR476673, ERR476672, ERR476671, ERR476670, ERR476669, ERR476668, ERR476667, ERR476666, ERR476665, ERR476664, ERR476663, ERR476662, ERR476661, ERR476660, ERR476659, ERR476658, ERR476657, ERR466189, ERR466188, ERR466187, ERR454048, ERR440229, ERR440228, ERR440227, ERR440226, ERR440225, ERR440224, ERR440223, ERR440222, ERR431525, ERR431524, ERR431523, ERR431522, ERR431521, ERR431520, ERR431519, ERR431518, ERR431517, ERR431516, ERR431515, ERR431514, ERR431513, ERR431512, ERR430942, ERR430941, ERR430940, ERR430939, ERR430938, ERR430937, ERR426418, ERR426417, ERR426416, ERR426415, ERR426414, ERR426413, ERR426412, ERR426411, ERR426410, ERR426408, ERR426407, ERR426405, ERR426404, ERR426403, ERR426402, ERR426401, ERR426400, ERR426399, ERR426398, ERR426397, ERR426396, ERR426395, ERR426394, ERR426393, ERR426392, ERR426391, ERR425051, ERR425050, ERR424893, ERR424892, ERR424891, ERR424778, ERR424777, ERR424776, ERR424775, ERR424774, ERR424773, ERR424772, ERR424771, ERR424770, ERR424769, ERR424768, ERR424767, ERR424766, ERR424765, ERR424764, ERR424763, ERR424762, ERR424761, ERR424760, ERR424759, ERR424758, ERR424757, ERR424756, ERR424754, ERR424753, ERR424751, ERR424750, ERR424749, ERR424748, ERR424747, ERR424746, ERR424744, ERR424743, ERR424742, ERR424741, ERR424740, ERR424739, ERR424738, ERR424737, ERR424736, ERR424735, ERR424734, ERR424733, ERR424732, ERR424730, ERR424729, ERR424728, ERR424727, ERR424726, ERR424725, ERR424724, ERR424723, ERR424722, ERR424721, ERR420534, ERR420533, ERR420532, ERR420531, ERR420530, ERR420529, ERR420528, ERR420527, ERR420526, ERR420525, ERR420524, ERR420523, ERR420522, ERR420521, ERR420520, ERR420519, ERR420518, ERR420517, ERR420516, ERR420515, ERR420514, ERR420513,

ERR420512, ERR420511, ERR420272, ERR420271, ERR420270, ERR420269, ERR420268, ERR420267, ERR420266, ERR420265, ERR420264, ERR420263, ERR420262, ERR420261, ERR420260, ERR420259, ERR420258, ERR420257, ERR420256, ERR420255, ERR420254, ERR420253, ERR420252, ERR420251, ERR420250, ERR420249, ERR420248, ERR420247, ERR420246, ERR420245, ERR420244, ERR420243, ERR420242, ERR420241, ERR420240, ERR420239, ERR420238, ERR420237, ERR420236, ERR420235, ERR420234, ERR420233, ERR420232, ERR420231, ERR420230, ERR420229, ERR420228, ERR420227, ERR420226, ERR420224, ERR420223, ERR420222, ERR420221, ERR420220, ERR420219, ERR420218, ERR420217, ERR420216, ERR420215, ERR420214, ERR420213, ERR420212, ERR420211, ERR420210, ERR420209, ERR420208, ERR420207, ERR420206, ERR420205, ERR420204, ERR420203, ERR420202, ERR420201, ERR420200, ERR420199, ERR420198, ERR420197, ERR420196, ERR420195, ERR420194, ERR420193, ERR420192, ERR420191, ERR420190, ERR420189, ERR420188, ERR420187, ERR420186, ERR420185, ERR420184, ERR420183, ERR420182, ERR420181, ERR420180, ERR420179, ERR420178, ERR420177, ERR420176, ERR420175, ERR420174, ERR420173, ERR420172, ERR420171, ERR420170, ERR420169, ERR420168, ERR420167, ERR420166, ERR420165, ERR420164, ERR420163, ERR420162, ERR420161, ERR420160, ERR420159, ERR420158, ERR420157, ERR420156, ERR420155, ERR420154, ERR420153, ERR420152, ERR420151, ERR420150, ERR420149, ERR420148, ERR420147, ERR420146, ERR420145, ERR420144, ERR420143, ERR420142, ERR420141, ERR420140, ERR420139, ERR420138, ERR420137, ERR420136, ERR420135, ERR420134, ERR420133, ERR420132, ERR420131, ERR420130, ERR420129, ERR420128, ERR420127, ERR420126, ERR419274, ERR419273, ERR419272, ERR418038, ERR418037, ERR418036, ERR411598, ERR392402, ERR392401, ERR392400, ERR392399, ERR392084, ERR392083, ERR392082, ERR392081, ERR392080, ERR392079, ERR392078, ERR392077, ERR392076, ERR392075, ERR392074, ERR392073, ERR392072, ERR392071, ERR392070, ERR392069, ERR392068, ERR392067, ERR392066, ERR392065, ERR392064, ERR392063, ERR392062, ERR392061, ERR392060, ERR392059, ERR392058, ERR392057, ERR392056, ERR392055, ERR386163, ERR386162, ERR385866, ERR385865, ERR385864, ERR385863, ERR385862, ERR385861, ERR380521, ERR380520, ERR380519, ERR380518, ERR380517, ERR380516, ERR380515, ERR380514, ERR380513, ERR380512, ERR380511, ERR380510, ERR380509, ERR380508, ERR380507, ERR380506, ERR380505, ERR380504, ERR380503, ERR380502, ERR380501, ERR380500, ERR380499, ERR380498, ERR377681, ERR377680, ERR377679, ERR377678, ERR377677, ERR377676, ERR377675, ERR377674, ERR377673, ERR377672, ERR377671, ERR377670, ERR377669, ERR377668, ERR367949, ERR367948, ERR367947, ERR367946, ERR367945, ERR367944, ERR367943, ERR367942, ERR367941, ERR367940, ERR367939, ERR367937, ERR367936, ERR364417, ERR364416, ERR364415, ERR364414, ERR364413, ERR364412, ERR364411, ERR364410, ERR364409, ERR364408, ERR364407, ERR364406, ERR364405, ERR364404, ERR364403, ERR364402, ERR364401, ERR364400, ERR364399, ERR364398, ERR364397, ERR364396, ERR364395, ERR364394, ERR364393, ERR364392, ERR364391, ERR364390, ERR364389, ERR364388, ERR364387, ERR364386, ERR364385, ERR364384, ERR364383, ERR364382, ERR364381, ERR364380, ERR364379, ERR364378, ERR364377, ERR364376, ERR364375, ERR364374, ERR364373, ERR364372,

ERR364371, ERR364370, ERR364369, ERR364368, ERR364367, ERR364366, ERR364365, ERR364364, ERR364363, ERR364362, ERR364361, ERR364360, ERR364359, ERR364358, ERR364357, ERR364356, ERR364355, ERR364354, ERR364353, ERR364352, ERR364351, ERR364350, ERR364349, ERR364348, ERR364347, ERR364346, ERR364345, ERR364344, ERR364343, ERR364342, ERR364341, ERR364340, ERR364339, ERR364338, ERR364337, ERR364336, ERR364335, ERR364334, ERR364333, ERR364332, ERR364331, ERR364330, ERR364329, ERR364324, ERR364323, ERR364322, ERR364321, ERR364320, ERR361367, ERR361366, ERR361365, ERR361364, ERR361363, ERR361362, ERR359855, ERR359854, ERR359853, ERR359852, ERR359851, ERR359850, ERR351508, ERR351507, ERR351336, ERR351335, ERR351334, ERR351333, ERR351332, ERR351331, ERR340456, ERR340455, ERR340454, ERR340453, ERR340452, ERR340451, ERR340450, ERR338561, ERR338560, ERR338501, ERR338500, ERR338499, ERR338498, ERR338497, ERR338496, ERR338495, ERR338494, ERR338493, ERR324436, ERR324363, ERR324362, ERR324361, ERR324360, ERR324359, ERR324358, ERR313239, ERR313238, ERR313237, ERR313236, ERR313235, ERR313234, ERR313233, ERR313232, ERR313231, ERR313230, ERR313229, ERR313228, ERR313227, ERR313226, ERR313225, ERR313224, ERR313223, ERR313222, ERR313221, ERR313220, ERR313219, ERR313218, ERR313217, ERR313216, ERR305632, ERR305631, ERR305630, ERR305333, ERR305332, ERR305331, ERR305330, ERR305329, ERR305328, ERR305327, ERR305326, ERR305325, ERR305324, ERR305323, ERR305322, ERR305321, ERR305320, ERR305319, ERR305318, ERR305317, ERR305316, ERR305315, ERR305314, ERR305313, ERR305312, ERR305311, ERR305310, ERR305309, ERR305308, ERR305307, ERR305306, ERR305305, ERR305304, ERR305303, ERR305302, ERR305301, ERR305300, ERR305299, ERR305298, ERR305297, ERR305296, ERR305295, ERR305294, ERR305293, ERR305292, ERR305291, ERR305290, ERR305289, ERR305288, ERR305287, ERR305286, ERR305285, ERR305284, ERR305283, ERR305282, ERR305281, ERR305280, ERR305279, ERR305278, ERR305277, ERR305276, ERR305275, ERR305274, ERR299266, ERR299265, ERR299264, ERR299263, ERR299262, ERR299261, ERR299260, ERR299259, ERR299257, ERR297373, ERR297372, ERR297371, ERR294030, ERR294029, ERR294028, ERR294027, ERR294026, ERR294025, ERR294024, ERR294023, ERR294022, ERR294021, ERR294020, ERR294019, ERR294018, ERR294017, ERR294016, ERR294015, ERR294014, ERR294013, ERR294012, ERR294011, ERR294010, ERR294009, ERR294008, ERR294007, ERR294006, ERR294005, ERR294004, ERR294003, ERR294002, ERR294001, ERR274581, ERR274580, ERR274579, ERR274578, ERR274577, ERR274576, ERR274575, ERR274574, ERR274573, ERR274405, ERR274404, ERR274403, ERR274402, ERR274400, ERR274399, ERR274398, ERR274397, ERR274396, ERR274395, ERR274393, ERR274392, ERR274391, ERR274390, ERR274389, ERR274388, ERR274387, ERR274311, ERR274310, ERR274309, ERR274308, ERR272424, ERR272423, ERR272422, ERR272421, ERR272420, ERR272419, ERR268476, ERR268475, ERR268474, ERR268473, ERR268472, ERR268471, ERR266238, ERR266237, ERR266236, ERR266235, ERR266234, ERR266233, ERR266232, ERR266231, ERR266230, ERR266229, ERR266228, ERR266227, ERR266226, ERR266225, ERR266224, ERR266223, ERR266222, ERR266221, ERR266130, ERR266129, ERR266128, ERR266127, ERR260473, ERR260472, ERR260471, ERR260470, ERR260469, ERR260468, ERR260467, ERR260466,

ERR260465, ERR260464, ERR260463, ERR260462, ERR260461, ERR260460, ERR260459, ERR260458, ERR260457, ERR260456, ERR260455, ERR260454, ERR260453, ERR260452, ERR260451, ERR260450, ERR260449, ERR260448, ERR260447, ERR260446, ERR260445, ERR260444, ERR260443, ERR260442, ERR260441, ERR260440, ERR260439, ERR260438, ERR260437, ERR260436, ERR260435, ERR260434, ERR260433, ERR260432, ERR260431, ERR260430, ERR260428, ERR260427, ERR260426, ERR260425, ERR260424, ERR260423, ERR260422, ERR260420, ERR260419, ERR260418, ERR260417, ERR260416, ERR260415, ERR260414, ERR260413, ERR260412, ERR260411, ERR260410, ERR260409, ERR260408, ERR260324, ERR260323, ERR260322, ERR260320, ERR260319, ERR260318, ERR260317, ERR260316, ERR260315, ERR260313, ERR260311, ERR260310, ERR260309, ERR260308, ERR260307, ERR246406, ERR246405, ERR246404, ERR246403, ERR246402, ERR246401, ERR246400, ERR246399, ERR246398, ERR246397, ERR246396, ERR246395, ERR244144, ERR244143, ERR229858, ERR229857, ERR229856, ERR229855, ERR229854, ERR229853, ERR229852, ERR229851, ERR229850, ERR229849, ERR229848, ERR229847, ERR229846, ERR229845, ERR229844, ERR229843, ERR229842, ERR229841, ERR229840, ERR229839, ERR229838, ERR229837, ERR229836, ERR229835, ERR229834, ERR229833, ERR229832, ERR229831, ERR229830, ERR229829, ERR229828, ERR229827, ERR229826, ERR220347, ERR220346, ERR219219, ERR218325, ERR216277, ERR216276, ERR216275, ERR216274, ERR216244, ERR216243, ERR202897, ERR202896, ERR202895, ERR202894, ERR202893, ERR202891, ERR202890, ERR202889, ERR202888, ERR202887, ERR202886, ERR202884, ERR202883, ERR202882, ERR202881, ERR202880, ERR202879, ERR202877, ERR202876, ERR202875, ERR202874, ERR202873, ERR202872, ERR202870, ERR202869, ERR202868, ERR202867, ERR202866, ERR202865, ERR202863, ERR202862, ERR202861, ERR202860, ERR202859, ERR202858, ERR202856, ERR202855, ERR202854, ERR202853, ERR202852, ERR202851, ERR202850, ERR185939, ERR185938, ERR185937, ERR185936, ERR185935, ERR185934, ERR185933, ERR185932, ERR185931, ERR185930, ERR185929, ERR185927, ERR179756, ERR179755, ERR179754, ERR173149, ERR173148, ERR173147, ERR173146, ERR167187, ERR167186, ERR167185, ERR167183, ERR167182, ERR167180, ERR167178, ERR167177, ERR167176, ERR167175, ERR167174, ERR167172, ERR167171, ERR167170, ERR167169, ERR167168, ERR167167, ERR163136, ERR163042, ERR163041, ERR163040, ERR163039, ERR161610, ERR159679, ERR157999, ERR157998, ERR157997, ERR157996, ERR157995, ERR157994, ERR157993, ERR157992, ERR157991, ERR157990, ERR157989, ERR157988, ERR150457, ERR150456, ERR150455, ERR150454, ERR150453, ERR150452, ERR150451, ERR150450, ERR150449, ERR117406, ERR117405, ERR117404, ERR117403, ERR117402, ERR117401, ERR117400, ERR117399, ERR117398, ERR117397, ERR117396, ERR117395, ERR117394, ERR117393, ERR117392, ERR117391, ERR117390, ERR117389, ERR117388, ERR117387, ERR117386, ERR117385, ERR117384, ERR117383, ERR117382, ERR117381, ERR117380, ERR117379, ERR117378, ERR117377, ERR117376, ERR117375, ERR117374, ERR117373, ERR117372, ERR117371, ERR117370, ERR117369, ERR117368, ERR117367, ERR117366, ERR117365, ERR117364, ERR117363, ERR117362, ERR117361, ERR117360, ERR117359, ERR117358, ERR117357, ERR117356, ERR117355, ERR117354, ERR117353, ERR117352, ERR117351, ERR117350, ERR117349, ERR117348, ERR117347,

ERR117346, ERR117345, ERR117344, ERR117343, ERR117342, ERR117341, ERR117340, ERR117339, ERR117338, ERR117337, ERR117336, ERR117335, ERR117334, ERR117333, ERR117332, ERR117331, ERR117330, ERR108252, ERR108251, ERR108250, ERR108249, ERR108248, ERR108247, ERR108246, ERR108245, ERR108244, ERR108243, ERR108242, ERR108241, ERR105078, ERR105077, ERR105076, ERR105075, ERR105074, ERR105073, ERR105072, ERR105071, ERR105070, ERR105069, ERR105068, ERR105067, ERR104860, ERR103018, ERR103017, ERR103016, ERR102987, ERR102986, ERR102985, ERR102984, ERR102982, ERR101898, ERR101897, ERR086305, ERR073025, ERR073024, ERR073023, ERR072806, ERR072805, ERR072804, ERR072803, ERR071287, ERR071285, ERR063468, ERR063467, ERR063466, ERR063465, ERR063461, ERR062151, ERR062150, ERR062149, ERR062148, ERR062147, ERR062146, ERR062145, ERR056481, ERR056480, ERR056479, ERR056478, ERR056477, ERR055401, ERR055400, ERR055398, ERR049714, ERR049713, ERR049712, ERR049711, ERR049710, ERR049709, ERR049708, ERR049707, ERR049706, ERR049705, ERR049704, ERR049703, ERR049702, ERR049701, ERR049700, ERR048960, ERR047562, ERR047561, ERR047560, ERR045183, ERR045182, ERR045181, ERR045180, ERR045179, ERR044271, ERR044270, ERR044269, ERR044268, ERR044267, ERR037695, ERR037694, ERR037693, ERR037692, ERR037691, ERR037690, ERR037689, ERR037687, ERR037685, ERR037683, ERR037681, ERR037679, ERR037339, ERR037338, ERR037337, ERR037336, ERR037335, ERR037334, ERR037333, ERR037332, ERR037331, ERR037330, ERR037329, ERR037328, ERR037327, ERR037326, ERR037325, ERR037324, ERR037323, ERR037322, ERR037321, ERR037320, ERR037319, ERR037318, ERR037317, ERR037316, ERR037315, ERR037314, ERR037313, ERR037312, ERR037311, ERR037310, ERR037309, ERR037308, ERR037307, ERR037306, ERR037305, ERR037304, ERR037303, ERR037302, ERR037301, ERR037300, ERR037299, ERR037298, ERR037297, ERR037296, ERR037295, ERR037294, ERR034939, ERR034938, ERR033806, ERR033805, ERR033804, ERR033803, ERR033801, ERR033800, ERR033799, ERR033798, ERR033797, ERR033796, ERR029924, ERR029923, ERR029922, ERR029921, ERR029920, ERR029919, ERR029918, ERR029917, ERR029916, ERR029915, ERR029914, ERR029913, ERR029912, ERR029911, ERR029910, ERR029909, ERR029553, ERR029552, ERR029551, ERR029550, ERR029549, ERR029548, ERR029547, ERR029546, ERR029545, DRR057397, DRR057396, DRR057395, DRR057394, DRR057393, DRR057392, DRR057391, DRR057390, DRR057389, DRR057388, DRR057387, DRR057386, DRR057385, DRR057384, DRR057383, DRR057382, DRR057381, DRR057380, DRR057379, DRR057378, DRR057377, DRR057376, DRR057375, DRR057333, DRR057332, DRR057331, DRR057330, DRR057329, DRR057328, DRR057327, DRR057326, DRR057325, DRR057324, DRR057323, DRR057322, DRR057321, DRR057320, DRR057319, DRR057318, DRR057317, DRR057316, DRR057315, DRR057314, DRR057313, DRR057312, DRR057311, DRR057310, DRR057309, DRR057246, DRR057094, DRR057093, DRR057092, DRR057091, DRR057090, DRR057089, DRR057088, DRR057087, DRR057086, DRR057085, DRR057084, DRR057083, DRR057082, DRR057081, DRR057080, DRR057079, DRR057078, DRR057077, DRR057076, DRR057075, DRR057074, DRR057073, DRR057072, DRR057071, DRR057070, DRR057069, DRR057068, DRR057067, DRR057066, DRR057065, DRR057064, DRR057063, DRR057062, DRR057061, DRR057060, DRR057059, DRR055003, DRR055002, DRR051081,

DRR051080, DRR051079, DRR051078, DRR051077, DRR051076, DRR051075, DRR051074, DRR051073, DRR051072, DRR051071, DRR051070, DRR051069, DRR051068, DRR050262, DRR050261, DRR050260, DRR050259, DRR050216, DRR050215, DRR050214, DRR050213, DRR050212, DRR050211, DRR050210, DRR050209, DRR050208, DRR050207, DRR050206, DRR050205, DRR050204, DRR050203, DRR050202, DRR050201, DRR050200, DRR050199, DRR050198, DRR050197, DRR050196, DRR050195, DRR050194, DRR050193, DRR050192, DRR050191, DRR050190, DRR050189, DRR050188, DRR050187, DRR050186, DRR050185, DRR050184, DRR050183, DRR049628, DRR049627, DRR049626, DRR049625, DRR049624, DRR049623, DRR048608, DRR048607, DRR048606, DRR048605, DRR048604, DRR048603, DRR048602, DRR048601, DRR048600, DRR048599, DRR048598, DRR048597, DRR048496, DRR048495, DRR048438, DRR048437, DRR047293, DRR047292, DRR047247, DRR047246, DRR046993, DRR045279, DRR045278, DRR045277, DRR045276, DRR045099, DRR045098, DRR045097, DRR045096, DRR045095, DRR045094, DRR045093, DRR045092, DRR040009, DRR040008, DRR036954, DRR036953, DRR036952, DRR036951, DRR036950, DRR036949, DRR036948, DRR036947, DRR036946, DRR036753, DRR036752, DRR034330, DRR034329, DRR034328, DRR034327, DRR034326, DRR034325, DRR034324, DRR034323, DRR034322, DRR034321, DRR034320, DRR034319, DRR034318, DRR034317, DRR034316, DRR034315, DRR034314, DRR034313, DRR034312, DRR034311, DRR034310, DRR034309, DRR034308, DRR034307, DRR034306, DRR034305, DRR034304, DRR034303, DRR034302, DRR034301, DRR034300, DRR034299, DRR034298, DRR034297, DRR034296, DRR034295, DRR034294, DRR034293, DRR034292, DRR034291, DRR034290, DRR034289, DRR034288, DRR034287, DRR034286, DRR034285, DRR034284, DRR034283, DRR034282, DRR034281, DRR034280, DRR034279, DRR034278, DRR034277, DRR034276, DRR034275, DRR034274, DRR034273, DRR034272, DRR034271, DRR034270, DRR034269, DRR034268, DRR034267, DRR034266, DRR034265, DRR034264, DRR034263, DRR034262, DRR034261, DRR034260, DRR034259, DRR034258, DRR034257, DRR034256, DRR034255, DRR034254, DRR034253, DRR034252, DRR034251, DRR034250, DRR034249, DRR034248, DRR034247, DRR034246, DRR034245, DRR033162, DRR033161, DRR033160, DRR033159, DRR032406, DRR031996, DRR031995, DRR031994, DRR031993, DRR031992, DRR031991, DRR031990, DRR031989, DRR031988, DRR031987, DRR031986, DRR031985, DRR031984, DRR031877, DRR031876, DRR031875, DRR031874, DRR031873, DRR031872, DRR031871, DRR031870, DRR031435, DRR031434, DRR031432, DRR031431, DRR031430, DRR031429, DRR031428, DRR031427, DRR031426, DRR031289, DRR031288, DRR031287, DRR031286, DRR031285, DRR031284, DRR031283, DRR031282, DRR031281, DRR031211, DRR031149, DRR031148, DRR031147, DRR031146, DRR031145, DRR031144, DRR031143, DRR031142, DRR031141, DRR031140, DRR031139, DRR031138, DRR031137, DRR031136, DRR031135, DRR031134, DRR031133, DRR031132, DRR031131, DRR031130, DRR030784, DRR030766, DRR030765, DRR030764, DRR030763, DRR030762, DRR030761, DRR030760, DRR030759, DRR030758, DRR030757, DRR029576, DRR029575, DRR029574, DRR029573, DRR029572, DRR029571, DRR029570, DRR029569, DRR029568, DRR029567, DRR029312, DRR029311, DRR029310, DRR029309, DRR029011, DRR029009, DRR029008, DRR029007, DRR028938, DRR028937, DRR028936, DRR028935, DRR027374, DRR027373, DRR027372, DRR027371, DRR026830, DRR026829, DRR026828,

DRR026827, DRR026826, DRR026825, DRR026824, DRR026823, DRR026822, DRR026821,
DRR026820, DRR026819, DRR026818, DRR026817, DRR026816, DRR026815, DRR026814,
DRR026813, DRR026812, DRR026811, DRR026810, DRR026809, DRR024485, DRR024484,
DRR024483, DRR024482, DRR023939, DRR023938, DRR023937, DRR023936, DRR023935,
DRR023934, DRR023933, DRR023932, DRR023931, DRR023930, DRR023929, DRR023928,
DRR023927, DRR023926, DRR023925, DRR023924, DRR023923, DRR023922, DRR023921,
DRR023920, DRR023919, DRR023918, DRR023917, DRR023916, DRR023777, DRR023776,
DRR023775, DRR023774, DRR023773, DRR023772, DRR023767, DRR023766, DRR023765,
DRR023243, DRR023242, DRR023241, DRR023240, DRR023239, DRR023238, DRR023237,
DRR023236, DRR023235, DRR023234, DRR023233, DRR023232, DRR023231, DRR023230,
DRR023229, DRR023228, DRR023227, DRR023226, DRR023033, DRR023032, DRR023031,
DRR023025, DRR022241, DRR021717, DRR021716, DRR021715, DRR021714, DRR021713,
DRR021712, DRR021711, DRR021710, DRR021709, DRR021708, DRR021707, DRR021706,
DRR021705, DRR021704, DRR021703, DRR021702, DRR021701, DRR021689, DRR021688,
DRR021687, DRR021400, DRR021399, DRR021398, DRR021397, DRR021396, DRR021395,
DRR021394, DRR021393, DRR021358, DRR021357, DRR021356, DRR021355, DRR021354,
DRR021353, DRR019497, DRR019496, DRR019495, DRR019494, DRR019493, DRR019492,
DRR019491, DRR019490, DRR019489, DRR019488, DRR019487, DRR019486, DRR019485,
DRR019484, DRR019483, DRR019482, DRR018525, DRR018524, DRR018523, DRR018522,
DRR018428, DRR018427, DRR018426, DRR018425, DRR018424, DRR018423, DRR018422,
DRR018378, DRR018377, DRR018376, DRR018375, DRR018374, DRR018373, DRR016806,
DRR016805, DRR016804, DRR016728, DRR016727, DRR016693, DRR016692, DRR016691,
DRR016519, DRR016460, DRR016459, DRR016458, DRR016457, DRR016456, DRR016141,
DRR016140, DRR016139, DRR016138, DRR016137, DRR016136, DRR016135, DRR016134,
DRR016133, DRR016132, DRR016131, DRR016130, DRR016129, DRR016128, DRR016127,
DRR016126, DRR016125, DRR016116, DRR016115, DRR016114, DRR016113, DRR016112,
DRR016093, DRR016092, DRR015697, DRR015696, DRR015695, DRR015694, DRR015693,
DRR015692, DRR015678, DRR015677, DRR015676, DRR015675, DRR015674, DRR015673,
DRR015005, DRR015004, DRR015003, DRR015002, DRR015001, DRR015000, DRR014999,
DRR014998, DRR014994, DRR014993, DRR014992, DRR014991, DRR014990, DRR014989,
DRR014988, DRR014987, DRR014986, DRR014985, DRR014984, DRR014983, DRR014982,
DRR014981, DRR014980, DRR014979, DRR014978, DRR014932, DRR014781, DRR014780,
DRR014779, DRR014777, DRR014776, DRR014775, DRR014774, DRR014773, DRR014772,
DRR014771, DRR014770, DRR014769, DRR014768, DRR014767, DRR014766, DRR014765,
DRR014764, DRR014763, DRR014762, DRR014761, DRR014760, DRR014759, DRR014758,
DRR014757, DRR014756, DRR014755, DRR014754, DRR014753, DRR014752, DRR014751,
DRR014750, DRR014749, DRR014748, DRR014747, DRR014746, DRR014745, DRR014744,
DRR014743, DRR014395, DRR014394, DRR014393, DRR014233, DRR014231, DRR014230,
DRR014229, DRR014211, DRR014210, DRR014209, DRR014208, DRR014207, DRR014094,
DRR013977, DRR013976, DRR013975, DRR013974, DRR013973, DRR013927, DRR013834,
DRR013833, DRR013723, DRR013722, DRR013404, DRR013403, DRR013402, DRR013401,
DRR013400, DRR013399, DRR013398, DRR013397, DRR013396, DRR013395, DRR013394,

DRR013393, DRR013392, DRR013391, DRR013390, DRR013389, DRR013388, DRR013387, DRR013386, DRR013385, DRR013384, DRR013383, DRR013382, DRR013381, DRR013019, DRR013018, DRR013017, DRR013016, DRR013015, DRR012599, DRR012598, DRR010357, DRR010356, DRR010355, DRR010354, DRR010353, DRR008478, DRR008477, DRR008476, DRR008474, DRR008473, DRR008472, DRR008471, DRR008470, DRR008469, DRR006756, DRR006755, DRR006754, DRR006753, DRR006752, DRR006751, DRR006750, DRR006749, DRR006748, DRR006747, DRR006746, DRR006745, DRR006744, DRR006743, DRR006742, DRR006741, DRR006740, DRR006739, DRR006738, DRR006737, DRR006736, DRR006735, DRR006734, DRR006733, DRR006732, DRR006731, DRR006730, DRR006729, DRR006728, DRR006727, DRR006726, DRR006725, DRR006724, DRR006723, DRR006722, DRR006721, DRR006720, DRR006719, DRR006718, DRR006717, DRR006716, DRR006715, DRR006714, DRR006713, DRR006712, DRR006711, DRR006710, DRR006709, DRR006708, DRR006707, DRR006706, DRR006705, DRR006704, DRR006703, DRR006702, DRR006701, DRR006700, DRR006699, DRR006698, DRR006697, DRR006696, DRR006695, DRR006694, DRR006693, DRR006692, DRR006691, DRR006690, DRR006689, DRR006688, DRR006687, DRR006686, DRR006685, DRR006684, DRR006683, DRR006682, DRR006681, DRR006680, DRR006679, DRR006678, DRR006677, DRR006676, DRR006675, DRR006674, DRR006673, DRR006672, DRR006671, DRR006670, DRR006669, DRR006668, DRR006667, DRR006666, DRR006665, DRR006664, DRR006663, DRR006662, DRR006661, DRR006660, DRR006659, DRR006658, DRR006657, DRR006656, DRR006655, DRR006654, DRR006653, DRR006652, DRR006651, DRR006650, DRR006649, DRR006648, DRR006647, DRR006646, DRR006645, DRR006644, DRR006643, DRR006642, DRR006641, DRR006640, DRR006639, DRR006638, DRR006637, DRR006636, DRR006635, DRR006634, DRR006633, DRR006632, DRR006631, DRR006630, DRR006629, DRR006628, DRR006627, DRR006626, DRR006625, DRR006624, DRR006623, DRR006622, DRR006621, DRR006620, DRR006619, DRR006618, DRR006617, DRR006616, DRR006615, DRR006614, DRR006613, DRR006612, DRR006611, DRR006610, DRR006609, DRR006608, DRR006607, DRR006606, DRR006605, DRR006604, DRR006603, DRR006602, DRR006601, DRR006600, DRR006599, DRR006598, DRR006597, DRR006596, DRR006595, DRR006594, DRR006593, DRR006592, DRR006591, DRR006590, DRR006589, DRR006588, DRR006587, DRR006586, DRR006585, DRR006584, DRR006583, DRR006582, DRR006581, DRR006580, DRR006579, DRR006578, DRR006577, DRR006576, DRR006575, DRR006574, DRR006573, DRR006572, DRR006571, DRR006570, DRR006569, DRR006568, DRR006567, DRR006566, DRR006565, DRR006564, DRR006563, DRR006562, DRR006561, DRR006560, DRR006559, DRR006558, DRR006557, DRR006556, DRR006555, DRR006554, DRR006553, DRR006552, DRR006551, DRR006550, DRR006549, DRR006548, DRR006547, DRR006546, DRR006545, DRR006544, DRR006543, DRR006542, DRR006541, DRR006540, DRR006539, DRR006538, DRR006537, DRR006536, DRR006535, DRR006534, DRR006533, DRR006532, DRR006531, DRR006530, DRR006529, DRR006528, DRR006527, DRR006526, DRR006525, DRR006524, DRR006523, DRR006522, DRR006521, DRR006520, DRR006519, DRR006373, DRR006372, DRR006371, DRR006370, DRR006369, DRR006306, DRR006305, DRR006304, DRR006303, DRR006302, DRR006300, DRR006299, DRR006298, DRR004448, DRR004447, DRR004446, DRR004445, DRR003984, DRR003983, DRR003982, DRR003981, DRR003980,

DRR003979, DRR003960, DRR003959, DRR003958, DRR003957, DRR003956, DRR003955,
DRR003752, DRR003751, DRR003750, DRR003749, DRR003748, DRR003747, DRR003746,
DRR003745, DRR003744, DRR003743, DRR003742, DRR003741, DRR003740, DRR003739,
DRR003738, DRR003737, DRR003736, DRR003735, DRR003734, DRR003733, DRR003732,
DRR003731, DRR003730, DRR003729, DRR003728, DRR003727, DRR003726, DRR003725,
DRR003724, DRR003723, DRR003722, DRR003721, DRR003720, DRR003719, DRR003718,
DRR003717, DRR003716, DRR003715, DRR003714, DRR003713, DRR003712, DRR003711,
DRR003710, DRR003709, DRR003708, DRR003707, DRR003706, DRR003705, DRR003704,
DRR003703, DRR003702, DRR003701, DRR003696, DRR003384, DRR003383, DRR003159,
DRR003158, DRR003157, DRR003156, DRR003155, DRR003154, DRR003153, DRR003152,
DRR003151, DRR003150, DRR003149, DRR003148, DRR002738, DRR002737, DRR002736,
DRR002735, DRR002734, DRR002733, DRR002732, DRR002731, DRR002730, DRR002729,
DRR002728, DRR002727, DRR002726, DRR002725, DRR002724, DRR002723, DRR002722,
DRR002721, DRR002720, DRR002719, DRR002718, DRR002717, DRR002716, DRR002715,
DRR002714, DRR002713, DRR002712, DRR002711, DRR002710, DRR002709, DRR002708,
DRR002707, DRR002706, DRR002705, DRR002704, DRR002703, DRR002702, DRR002701,
DRR002700, DRR002699, DRR002698, DRR002697, DRR002696, DRR002695, DRR002694,
DRR002693, DRR002692, DRR002691, DRR002690, DRR002689, DRR002688, DRR002687,
DRR002686, DRR002685, DRR002684, DRR002683, DRR002682, DRR002592, DRR002591,
DRR002590, DRR002589, DRR002588, DRR002587, DRR002586, DRR002585, DRR002584,
DRR002583, DRR002582, DRR002581, DRR002580, DRR002579, DRR002578, DRR002577,
DRR002576, DRR002575, DRR002574, DRR002573, DRR002572, DRR002571, DRR002570,
DRR002569, DRR002568, DRR002567, DRR002566, DRR002565, DRR002564, DRR002563,
DRR002562, DRR002561, DRR002560, DRR002559, DRR002558, DRR002557, DRR002552,
DRR002551, DRR002284, DRR002283, DRR002282, DRR002135, DRR001991, DRR001990,
DRR001965, DRR001964, DRR001963, DRR001934, DRR001933, DRR001931, DRR001930,
DRR001929, DRR001928, DRR001926, DRR001925, DRR001924, DRR001923, DRR001922,
DRR001921, DRR001920, DRR001919, DRR001918, DRR001917, DRR001916, DRR001915,
DRR001908, DRR001907, DRR001906, DRR001905, DRR001904, DRR001903, DRR001902,
DRR001901, DRR001900, DRR001899, DRR001898, DRR001864, DRR001831, DRR001830,
DRR001829, DRR001828, DRR001827, DRR001826, DRR001825, DRR001824, DRR001554,
DRR001553, DRR001552, DRR001551, DRR001450, DRR001449, DRR001448, DRR001379,
DRR001378, DRR001377, DRR001375, DRR001374, DRR001373, DRR001372, DRR001371,
DRR001362, DRR001361, DRR001237, DRR001235, DRR001234, DRR001160, DRR001159,
DRR001141, DRR001140, DRR001139, DRR001138, DRR001137, DRR001136, DRR001135,
DRR001134, DRR001133, DRR001132, DRR001131, DRR001130, DRR001129, DRR001128,
DRR001127, DRR001126, DRR001125, DRR001124, DRR001123, DRR001122, DRR001102,
DRR001101, DRR001057, DRR001056, DRR001055, DRR001054, DRR001053, DRR001052,
DRR001051, DRR001050, DRR001049, DRR001048, DRR001047, DRR001046, DRR001045,
DRR001044, DRR001043, DRR001042, DRR001041, DRR001040, DRR001039, DRR001038,
DRR001037, DRR001036, DRR001035, DRR001034, DRR001033, DRR001032, DRR001031,
DRR001030, DRR001029, DRR001028, DRR001027, DRR001026, DRR001025, DRR001024,

DRR001019, DRR001018, DRR001016, DRR001015, DRR001014, DRR001013, DRR001012, DRR000893, DRR000769, DRR000768, DRR000767, DRR000766, DRR000765, DRR000764, DRR000763, DRR000762, DRR000761, DRR000760, DRR000759, DRR000758, DRR000757, DRR000756, DRR000755, DRR000754, DRR000753, DRR000752, DRR000751, DRR000750, DRR000749, DRR000748, DRR000747, DRR000746, DRR000745, DRR000630, DRR000629, DRR000628, DRR000627, DRR000626, DRR000621, DRR000620, DRR000619, DRR000618, DRR000585, DRR000584, DRR000362, DRR000361, DRR000360, DRR000359, DRR000357, DRR000356, DRR000355, DRR000354, DRR000353, DRR000352, DRR000351, DRR000350, DRR000349, SRR3407177, SRR3407154, SRR3180834, SRR3180833, SRR3141655, SRR3141213, SRR3138273, SRR3137622, SRR3137615, SRR3136910, SRR3136739, SRR3136738, SRR3136737, SRR3136736, SRR3136735, SRR3136734, SRR3136733, SRR3136732, SRR3136731, SRR3134951, SRR3134386, SRR3134379, SRR3134355, SRR3134332, SRR3134288, SRR3134254, SRR3134240, SRR3134224, SRR3130554, SRR3124516, SRR3123508, SRR3114961, SRR3112149, SRR3112111, SRR3111905, SRR3032149, SRR3031985, SRR3019986, SRR3019985, SRR3019984, SRR3019983, SRR3019982, SRR3019981, SRR3019980, SRR3019979, SRR3019978, SRR3019977, SRR3019976, SRR3019975, SRR3019974, SRR3019973, SRR3019972, SRR3019971, SRR3019970, SRR3019969, SRR3019968, SRR3019967, SRR3019966, SRR3019965, SRR3019964, SRR3019963, SRR3019962, SRR3019961, SRR3019960, SRR3019959, SRR3019958, SRR3019957, SRR3019956, SRR3019955, SRR3019954, SRR3019953, SRR3019952, SRR3019951, SRR3019950, SRR3019949, SRR3019948, SRR3019947, SRR3019946, SRR3019945, SRR3019944, SRR3019943, SRR3019942, SRR3019941, SRR3019940, SRR3019939, SRR3019938, SRR3019937, SRR3019936, SRR3019935, SRR3019934, SRR3019933, SRR3019932, SRR3019931, SRR3019930, SRR3019929, SRR3019928, SRR3019927, SRR3019926, SRR3019925, SRR3019924, SRR3019923, SRR3019922, SRR3019921, SRR3019920, SRR3019919, SRR3019918, SRR3019917, SRR3019916, SRR3019915, SRR3019914, SRR3019913, SRR3019912, SRR3019911, SRR3019910, SRR3019909, SRR3019908, SRR3019907, SRR3019906, SRR3019905, SRR3019904, SRR3019903, SRR3019902, SRR3019901, SRR3019900, SRR3019899, SRR3019898, SRR3019897, SRR3019896, SRR3019895, SRR3019894, SRR3019893, SRR3019892, SRR3019891, SRR3019890, SRR3019889, SRR3019888, SRR3019887, SRR3019886, SRR3019885, SRR3019884, SRR3019883, SRR3019882, SRR3019881, SRR3019880, SRR3019879, SRR3019878, SRR3019877, SRR3019876, SRR3019875, SRR3019874, SRR3019873, SRR3019872, SRR3019871, SRR3019870, SRR3019869, SRR3019868, SRR3019867, SRR3019866, SRR3019865, SRR3019864, SRR3019863, SRR3019862, SRR3019861, SRR3019860, SRR3019859, SRR3019858, SRR3019857, SRR3019856, SRR3019855, SRR3019854, SRR3019853, SRR3019852, SRR3019851, SRR3019850, SRR3019849, SRR3019848, SRR3019847, SRR3019846, SRR3019845, SRR3019844, SRR3019843, SRR3019842, SRR3019841, SRR3019840, SRR3019839, SRR3019838, SRR3019837, SRR3019836, SRR3019835, SRR3019834, SRR3019833, SRR3019832, SRR3019831, SRR3019830, SRR3019829, SRR3019828, SRR3019827, SRR3019826, SRR3019825, SRR3019824, SRR3019823, SRR3019822, SRR3019821,

SRR3019302, SRR3019301, SRR3019300, SRR3019299, SRR3019298, SRR3019297, SRR3019296, SRR3019295, SRR3019294, SRR3019293, SRR3019292, SRR3019291, SRR3019290, SRR3019289, SRR3019288, SRR3019287, SRR3019286, SRR3019285, SRR3019284, SRR3019283, SRR3019282, SRR3019281, SRR3019280, SRR3019279, SRR3019278, SRR3019277, SRR3019276, SRR3019275, SRR3019274, SRR3019273, SRR3019272, SRR3019271, SRR3019270, SRR3019269, SRR3019268, SRR3019267, SRR3019266, SRR3019265, SRR3019264, SRR3019263, SRR3019262, SRR3019261, SRR3019260, SRR3019259, SRR3019258, SRR3019257, SRR3019256, SRR3019255, SRR3019254, SRR3019253, SRR3019252, SRR3019251, SRR3019249, SRR3019248, SRR3019247, SRR3019246, SRR3019245, SRR3019243, SRR3019242, SRR3019241, SRR3019240, SRR3019239, SRR3019238, SRR3019237, SRR3019236, SRR3019235, SRR3019234, SRR3019233, SRR3019232, SRR3019231, SRR3019230, SRR3019228, SRR3019227, SRR3019226, SRR3019225, SRR3019224, SRR3019223, SRR3019222, SRR3019221, SRR3019220, SRR3019219, SRR3019218, SRR3019217, SRR3019216, SRR3019215, SRR3019214, SRR3019213, SRR3019212, SRR3019211, SRR3019210, SRR3019209, SRR2932432, SRR2898686, SRR2898681, SRR2895684, SRR2889254, SRR2889251, SRR2731353, SRR2659276, SRR2659264, SRR2658969, SRR2658853, SRR2658819, SRR2658764, SRR2658733, SRR2658680, SRR2658679, SRR2658677, SRR2658642, SRR2658041, SRR2533325, SRR2477713, SRR2176161, SRR2132439, SRR2132407, SRR2131816, SRR2131807, SRR2131061, SRR2126313, SRR2126301, SRR2103425, SRR2102895, SRR2102806, SRR2094583, SRR2081049, SRR2080054, SRR2078799, SRR2072407, SRR2063815, SRR2063809, SRR2062147, SRR2062083, SRR2049808, SRR2049807, SRR2049806, SRR2049805, SRR2049804, SRR2049803, SRR2049802, SRR2049801, SRR2049800, SRR2049799, SRR2049798, SRR2049797, SRR2049796, SRR2049795, SRR2049794, SRR2049793, SRR2049792, SRR2049791, SRR2048168, SRR2043884, SRR2043224, SRR2043223, SRR2043222, SRR2043221, SRR2043218, SRR2043187, SRR2042544, SRR2032456, SRR2032455, SRR2029834, SRR2029746, SRR2017830, SRR2015360, SRR2014476, SRR2014297, SRR2014227, SRR2012713, SRR2012530, SRR2012197, SRR2010403, SRR2005882, SRR2003638, SRR2003286, SRR1998029, SRR1997809, SRR1985110, SRR1978702, SRR1977386, SRR1976499, SRR1970641, SRR1965000, SRR1964814, SRR1964813, SRR1964812, SRR1964811, SRR1964810, SRR1964809, SRR1964808, SRR1964807, SRR1964806, SRR1964805, SRR1964804, SRR1964803, SRR1956722, SRR1956719, SRR1955059, SRR1954941, SRR1954940, SRR1954937, SRR1954930, SRR1954920, SRR1954919, SRR1950576, SRR1927152, SRR1919629, SRR1919628, SRR1919627, SRR1919626, SRR1919623, SRR1919622, SRR1914587, SRR1871486, SRR1871485, SRR1871484, SRR1871483, SRR1871482, SRR1871481, SRR1868067, SRR1868066, SRR1868065, SRR1868064, SRR1868063, SRR1868062, SRR1868061, SRR1868060, SRR1868059, SRR1868058, SRR1868057, SRR1868056, SRR1868055, SRR1868054, SRR1868053, SRR1868052, SRR1868051, SRR1868050, SRR1868049, SRR1868048, SRR1868047, SRR1868046, SRR1868045, SRR1868044, SRR1868043, SRR1868042, SRR1867750, SRR1855173, SRR1837939, SRR1837647, SRR1837636, SRR1837630, SRR1837625,

SRR1819622, SRR1819198, SRR1805338, SRR1799539, SRR1791627, SRR1791626, SRR1791625, SRR1791624, SRR1791623, SRR1791622, SRR1791621, SRR1791620, SRR1791619, SRR1791616, SRR1791609, SRR1791608, SRR1785334, SRR1785333, SRR1785332, SRR1785331, SRR1785330, SRR1785329, SRR1785328, SRR1785327, SRR1785326, SRR1785237, SRR1784895, SRR1784854, SRR1768445, SRR1767237, SRR1760197, SRR1752043, SRR1744393, SRR1743088, SRR1743015, SRR1743011, SRR1738680, SRR1738124, SRR1738104, SRR1737216, SRR1731223, SRR1726569, SRR1722457, SRR1722231, SRR1707994, SRR1698128, SRR1695172, SRR1685986, SRR1685984, SRR1685983, SRR1662174, SRR1662173, SRR1661088, SRR1660793, SRR1660792, SRR1660791, SRR1660789, SRR1660788, SRR1660786, SRR1660784, SRR1660783, SRR1660782, SRR1660781, SRR1660561, SRR1660533, SRR1660505, SRR1660504, SRR1660503, SRR1660502, SRR1660501, SRR1660500, SRR1660497, SRR1660496, SRR1660495, SRR1660472, SRR1660455, SRR1660453, SRR1660426, SRR1660425, SRR1660403, SRR1654209, SRR1653924, SRR1653617, SRR1653616, SRR1653614, SRR1653612, SRR1653609, SRR1652315, SRR1647718, SRR1647715, SRR1644052, SRR1633123, SRR1617211, SRR1615273, SRR1613929, SRR1613927, SRR1613371, SRR1610468, SRR1609976, SRR1609126, SRR1606324, SRR1588568, SRR1588504, SRR1587932, SRR1586434, SRR1586430, SRR1564474, SRR1564473, SRR1564472, SRR1564471, SRR1564470, SRR1564469, SRR1559346, SRR1559345, SRR1523072, SRR1514812, SRR1514624, SRR1497919, SRR1497777, SRR1497245, SRR1497126, SRR1496762, SRR1496639, SRR1496421, SRR1496188, SRR1421515, SRR1421514, SRR1411087, SRR1395300, SRR1371394, SRR1339506, SRR1339487, SRR1339482, SRR1339465, SRR1339464, SRR1329046, SRR1302044, SRR1295580, SRR1295575, SRR1295574, SRR1295573, SRR1284226, SRR1213585, SRR1199007, SRR1192258, SRR1188240, SRR1181642, SRR1174237, SRR1174236, SRR1166427, SRR1166397, SRR1166396, SRR1166395, SRR1166394, SRR1166393, SRR1166379, SRR1166378, SRR1151429, SRR1151425, SRR1151424, SRR1151423, SRR1151420, SRR1151419, SRR1151414, SRR1151413, SRR1151412, SRR1151411, SRR1151410, SRR1151409, SRR1139353, SRR1139352, SRR1139281, SRR1139192, SRR1138595, SRR1138594, SRR1138592, SRR1138591, SRR1138590, SRR1138587, SRR1138586, SRR1138585, SRR1138584, SRR1124756, SRR1124755, SRR1104889, SRR1104888, SRR1104887, SRR1104886, SRR1104149, SRR1049977, SRR1049388, SRR1022360, SRR1016866, SRR1016229, SRR1002798, SRR950161, SRR949821, SRR949257, SRR947796, SRR944676, SRR942828, SRR942574, SRR926398, SRR926396, SRR926395, SRR926394, SRR926393, SRR926392, SRR926391, SRR926348, SRR926347, SRR926342, SRR926281, SRR924323, SRR923884, SRR912962, SRR912955, SRR911783, SRR887342, SRR886270, SRR881376, SRR868519, SRR868504, SRR868498, SRR868497, SRR868491, SRR868490, SRR868484, SRR868477, SRR866887, SRR866239, SRR863394, SRR863384, SRR863092, SRR863064, SRR863061, SRR863042, SRR863026, SRR863020, SRR863019, SRR854521, SRR854520, SRR851131, SRR851097, SRR851096, SRR850813, SRR850241, SRR826691, SRR826557, SRR826412, SRR825195, SRR822475, SRR822471, SRR799899, SRR799310, SRR797944, SRR797223, SRR797216, SRR789734, SRR789727, SRR789322, SRR788158,

SRR787652, SRR787614, SRR786504, SRR768814, SRR651010, SRR651009, SRR651008, SRR651007, SRR651006, SRR651005, SRR651004, SRR651003, SRR651002, SRR651001, SRR651000, SRR650999, SRR650998, SRR650997, SRR650996, SRR650995, SRR650994, SRR650993, SRR650992, SRR650991, SRR650990, SRR650989, SRR650988, SRR650987, SRR650986, SRR650985, SRR650984, SRR650983, SRR650982, SRR650981, SRR650980, SRR650979, SRR650978, SRR650977, SRR650976, SRR650975, SRR650974, SRR650973, SRR650972, SRR650971, SRR650970, SRR650969, SRR650968, SRR650967, SRR650966, SRR650965, SRR650964, SRR650963, SRR650962, SRR650961, SRR650960, SRR650959, SRR650958, SRR650957, SRR650956, SRR650955, SRR650954, SRR650953, SRR650952, SRR650951, SRR650950, SRR650949, SRR650948, SRR650947, SRR650946, SRR650945, SRR650944, SRR650943, SRR650942, SRR650941, SRR650940, SRR650939, SRR650938, SRR650937, SRR650936, SRR650935, SRR650934, SRR650933, SRR650932, SRR650931, SRR650930, SRR650929, SRR650928, SRR650927, SRR650926, SRR650925, SRR650924, SRR650923, SRR650922, SRR650921, SRR650920, SRR650919, SRR650918, SRR650917, SRR650916, SRR650915, SRR650914, SRR650913, SRR650912, SRR650911, SRR650910, SRR650909, SRR650908, SRR650907, SRR650906, SRR650905, SRR650904, SRR617007, SRR449078, ERR1368770, ERR1368769, ERR1368768, ERR1368767, ERR1368766, ERR1368765, ERR1368764, ERR993505, ERR993504, ERR911111, ERR911110, ERR875948, ERR875947, ERR575758, ERR575757, ERR575756, ERR575755, ERR575754, ERR575753, ERR575752, ERR575751, ERR575750, ERR575749, ERR575748, ERR575747, ERR575746, ERR575745, ERR575744, ERR575743, ERR575742, ERR575741, ERR575740, ERR575739, ERR575738, ERR575737, ERR575736, ERR575735, ERR440221, ERR426409, ERR426406, ERR420225, ERR299258, ERR299256, ERR274401, ERR274394, ERR260407, ERR260321, ERR260314, ERR260312, ERR202892, ERR202885, ERR202878, ERR202871, ERR202864, ERR202857, ERR163137, ERR163135, ERR125361, ERR125360, ERR125359, ERR125358, ERR123493, ERR123492, ERR055399, ERR055397, ERR045184, ERR033802, DRR031433, DRR014778, DRR014232, DRR014228, DRR013020, DRR001932, DRR001927, ERR637971, ERR637972, ERR637973, ERR637974, ERR637975, ERR637976, ERR637977, ERR637978, ERR637979, ERR637980, ERR637981, ERR637982, ERR637983, ERR637984, ERR637985, ERR637986, ERR637987, ERR637988, ERR637989, ERR637990, ERR637992, ERR637994, ERR637996, ERR637998, ERR638000, ERR638001, ERR638002, ERR638003, ERR638004, ERR638007, ERR638008, ERR638009, ERR638013, ERR638014, ERR638015, ERR638016, ERR638017, ERR638018, ERR638020, ERR638027, ERR638028, ERR638029, ERR638030, ERR638031, ERR638032, ERR638033, ERR758253, ERR758254, ERR758255, ERR758256, ERR758257, ERR758258, ERR758259, ERR758260, ERR758261, ERR758262, ERR758263, ERR758264, ERR758265, ERR758266, ERR758267, ERR758268, ERR758269, ERR758270, ERR758271, ERR758272, ERR758273, ERR758274, ERR758275, ERR758276, ERR758277, ERR758278, ERR758279, ERR758280, ERR758281, ERR758282, ERR758283, ERR758284, ERR758285, ERR758286, ERR758287, ERR758288, ERR758289, ERR758290, ERR758291, ERR758292, ERR758293, ERR758294, ERR758295, ERR758296, ERR758297, ERR758298, ERR758299, ERR758300, SRR1956521, SRR1956725, SRR1956728, SRR1956734, SRR1956735, SRR1956737, SRR1956742, SRR1956743, SRR1956745, SRR1956746,

SRR1956747, SRR1956748, ERR246326, ERR637354, ERR637355, ERR637356, ERR637991, ERR637993, ERR637995, ERR637997, ERR637999, ERR638005, ERR638006, ERR638010, ERR638011, ERR638012, ERR638019, ERR638021, ERR638022, ERR638023, ERR638024, ERR638025, ERR638026, ERR706688, ERR789217, ERR789218, ERR789219, ERR789231, ERR789232, ERR789233, ERR789368, ERR789369, ERR789370, ERR789371, ERR789372, ERR789373, ERR789374, ERR789375, ERR789376, ERR789377, ERR789378, ERR789379, ERR789380, ERR789381, ERR789382, SRR1576768, SRR1652269, SRR1652271, SRR1652298, SRR1793202, SRR1797191, SRR1797338, SRR1797339, SRR1822471, SRR1822472, SRR1822473, SRR1822474, SRR1822475, SRR1822476, SRR1825711, SRR1848949, SRR1848950, SRR1848951, SRR1848952, SRR1848953, SRR1848954, SRR1848955, SRR1848956, SRR1848957, SRR1848958, SRR1848959, SRR1848960, SRR1870773, SRR1870774, SRR1870775, SRR1870776, SRR1870777, SRR1870778, SRR1870779, SRR1870780, SRR1870781, SRR1910441, SRR1910442, SRR1910443, SRR1910444, SRR1910445, SRR1917288, SRR1917289, SRR1917290, SRR1917291, SRR1917292, SRR1917293, SRR1917294, SRR1917295, SRR1917296, SRR1927012, SRR1927016, SRR1927157, SRR1927174, SRR1927175, SRR1927227, SRR1927254, SRR1928167, DRR023229, DRR023230, DRR023231, ERR458984, ERR458985, ERR458986, ERR458987, ERR458990, ERR458991, ERR458992, ERR458995, ERR458997, ERR458999, ERR459001, ERR459002, ERR459006, ERR459010, ERR459012, ERR459013, ERR459015, ERR459016, ERR459017, ERR459018, ERR459019, ERR459020, ERR459021, ERR459023, ERR459025, ERR459026, ERR459027, ERR459028, ERR459029, ERR459030, ERR459031, ERR459033, ERR459035, ERR459036, ERR459041, ERR459042, ERR459043, ERR459044, ERR459047, ERR459051, ERR459052, ERR459053, ERR459056, ERR459057, ERR459058, ERR459061, ERR459062, ERR459063, ERR459065, ERR459068, ERR459069, SRR1811834, SRR1812754, SRR1812759, SRR1812760, SRR1812767, SRR1812768, SRR1812770, SRR1812772, SRR1812973, SRR1812986, SRR1812995, SRR1812997, SRR1813906, SRR1813907, SRR1813949, SRR1813950, SRR1816783, SRR1816784, SRR1816785, SRR1816786, SRR1816787, SRR1816788, SRR1816789, SRR1816790, SRR1816791, SRR1816792, SRR1816872, SRR1816873, SRR1822445, SRR1822446, SRR1822447, SRR1822448, SRR1822449, SRR1822450, SRR1822451, SRR1822452, SRR1822453, SRR1822454, SRR1822455, SRR1822456, SRR1822457, SRR1822458, SRR1822459, SRR1822460, SRR1822461, SRR1822462, SRR1822463, SRR1822464, SRR1822465, SRR1822466, SRR1822467, SRR1822468, SRR1822469, SRR1822470, ERR458878, ERR458880, ERR458881, ERR458883, ERR458884, ERR458885, ERR458886, ERR458887, ERR458888, ERR458889, ERR458893, ERR458895, ERR458897, ERR458898, ERR458899, ERR458924, ERR458925, ERR458927, ERR458937, ERR458938, ERR458942, ERR458943, ERR458947, ERR458949, ERR458950, ERR458954, ERR458955, ERR458956, ERR458961, ERR458962, ERR458963, ERR458964, ERR458965, ERR458966, ERR458968, ERR458969, ERR458970, ERR458971, ERR458972, ERR458973, ERR458975, ERR458976, ERR458977, ERR458978, ERR458979, ERR458980, ERR458981, ERR458982, ERR459140, ERR459141, ERR459142, ERR459143, ERR459144, ERR459145, ERR459146, ERR459147, ERR459149, ERR459150, ERR459151, ERR459152, ERR459153, ERR459155, ERR459156, ERR459158,

ERR459159, ERR459160, ERR459162, ERR459164, ERR459165, ERR459166, ERR459168, ERR459171, ERR459172, ERR459175, ERR459176, ERR459178, ERR459179, ERR459180, ERR459181, ERR459183, ERR459184, ERR459185, ERR459187, ERR459188, ERR459189, ERR459190, ERR459191, ERR459192, ERR459193, ERR459194, ERR459195, ERR459196, ERR459197, ERR459198, ERR459199, ERR459200, ERR459201, ERR459202, ERR459203, ERR459204, ERR458879, ERR458882, ERR458890, ERR458891, ERR458892, ERR458894, ERR458896, ERR458900, ERR458905, ERR458907, ERR458911, ERR458930, ERR458944, ERR458945, ERR458946, ERR458948, ERR458951, ERR458952, ERR458953, ERR458957, ERR458958, ERR458959, ERR458960, ERR458967, ERR458974, ERR458983, ERR458988, ERR458989, ERR459067, ERR459070, ERR459071, ERR459072, ERR459073, ERR459074, ERR459075, ERR459076, ERR459077, ERR459078, ERR459079, ERR459080, ERR459081, ERR459082, ERR459083, ERR459084, ERR459085, ERR459086, ERR459087, ERR459088, ERR459089, ERR459090, ERR459091, ERR459092, ERR459093, ERR459094, ERR459095, ERR459096, ERR459097, ERR459098, ERR459100, ERR459102, ERR459104, ERR459106, ERR459107, ERR459112, ERR459118, ERR459119, ERR459120, ERR459121, ERR459122, ERR459123, ERR459124, ERR459125, ERR459126, ERR459127, ERR459128, ERR459129, ERR459130, ERR459131, ERR459132, ERR459133, ERR459134, ERR459135, ERR459136, ERR459137, ERR459138, ERR459139, ERR459148, ERR459154, ERR459157, ERR459161, ERR459163, ERR459167, ERR459169, ERR459170, ERR459173, ERR459174, ERR459177, ERR459182, ERR459186, ERR459205, ERR458535, ERR458536, ERR458537, ERR458538, ERR458539, ERR458540, ERR458541, ERR458542, ERR458543, ERR458544, ERR458545, ERR458547, ERR458549, ERR458550, ERR458551, ERR458553, ERR458554, ERR458556, ERR458557, ERR458559, ERR458560, ERR458561, ERR458901, ERR458902, ERR458903, ERR458904, ERR458906, ERR458908, ERR458909, ERR458910, ERR458912, ERR458913, ERR458914, ERR458915, ERR458916, ERR458917, ERR458918, ERR458919, ERR458920, ERR458921, ERR458922, ERR458923, ERR458926, ERR458928, ERR458929, ERR458931, ERR458932, ERR458933, ERR458934, ERR458935, ERR458936, ERR458939, ERR458940, ERR458941, ERR458993, ERR458994, ERR458996, ERR458998, ERR459000, ERR459003, ERR459004, ERR459005, ERR459007, ERR459008, ERR459009, ERR459011, ERR459014, ERR459022, ERR459024, ERR459032, ERR459034, ERR459037, ERR459038, ERR459039, ERR459040, ERR459045, ERR459046, ERR459048, ERR459049, ERR459050, ERR459054, ERR459055, ERR459059, ERR459060, ERR459064, ERR459066, ERR459099, ERR459101, ERR459103, ERR459105, ERR459108, ERR459109, ERR459110, ERR459111, ERR459113, ERR459114, ERR459115, ERR459116, ERR459117, ERR459206, ERR458500, ERR458501, ERR458502, ERR458503, ERR458504, ERR458505, ERR458506, ERR458507, ERR458508, ERR458509, ERR458510, ERR458511, ERR458512, ERR458513, ERR458514, ERR458515, ERR458516, ERR458517, ERR458518, ERR458519, ERR458520, ERR458521, ERR458522, ERR458523, ERR458525, ERR458526, ERR458527, ERR458528, ERR458529, ERR458531, ERR458532, ERR458533, ERR458534, ERR458752, ERR458753, ERR458754, ERR458755, ERR458756, ERR458757, ERR458759, ERR458761, ERR458763, ERR458764, ERR458765, ERR458766, ERR458767, ERR458768, ERR458769, ERR458770, ERR458771, ERR458772, ERR458773, ERR458774, ERR458775, ERR458776, ERR458779, ERR458780, ERR458782,

ERR458785, ERR458786, ERR458787, ERR458789, ERR458790, ERR458792, ERR458793, ERR458794, ERR458795, ERR458797, ERR458798, ERR458799, ERR458800, ERR458801, ERR458802, ERR458804, ERR458805, ERR458806, ERR458808, ERR458809, ERR458810, ERR458811, ERR458813, ERR458814, ERR458815, ERR458816, ERR458818, ERR458819, ERR458820, ERR458821, ERR458822, ERR458823, ERR458824, ERR458825, ERR458826, ERR458827, ERR458829, ERR458830, ERR458831, ERR458832, ERR458833, ERR458835, ERR458627, ERR458628, ERR458629, ERR458631, ERR458632, ERR458634, ERR458635, ERR458636, ERR458638, ERR458639, ERR458640, ERR458643, ERR458644, ERR458645, ERR458646, ERR458647, ERR458648, ERR458649, ERR458650, ERR458651, ERR458652, ERR458655, ERR458656, ERR458657, ERR458658, ERR458660, ERR458662, ERR458663, ERR458664, ERR458665, ERR458666, ERR458668, ERR458669, ERR458670, ERR458671, ERR458672, ERR458673, ERR458674, ERR458675, ERR458676, ERR458677, ERR458678, ERR458679, ERR458680, ERR458682, ERR458683, ERR458685, ERR458687, ERR458688, ERR458689, ERR458690, ERR458691, ERR458692, ERR458693, ERR458694, ERR458695, ERR458696, ERR458697, ERR458698, ERR458700, ERR458701, ERR458702, ERR458704, ERR458705, ERR458706, ERR458707, ERR458709, ERR458710, ERR458712, ERR458713, ERR458714, ERR458715, ERR458716, ERR458718, ERR458721, ERR458722, ERR458724, ERR458725, ERR458727, ERR458728, ERR458729, ERR458731, ERR458732, ERR458733, ERR458734, ERR458735, ERR458736, ERR458737, ERR458738, ERR458739, ERR458740, ERR458741, ERR458742, ERR458743, ERR458744, ERR458746, ERR458747, ERR458748, ERR458749, ERR458751, ERR458552, ERR458555, ERR458558, ERR458562, ERR458563, ERR458564, ERR458565, ERR458566, ERR458567, ERR458568, ERR458569, ERR458570, ERR458571, ERR458572, ERR458573, ERR458574, ERR458575, ERR458576, ERR458577, ERR458578, ERR458579, ERR458580, ERR458581, ERR458582, ERR458583, ERR458584, ERR458585, ERR458586, ERR458587, ERR458588, ERR458589, ERR458590, ERR458591, ERR458592, ERR458593, ERR458594, ERR458595, ERR458596, ERR458597, ERR458598, ERR458599, ERR458600, ERR458601, ERR458602, ERR458603, ERR458604, ERR458605, ERR458606, ERR458607, ERR458608, ERR458609, ERR458610, ERR458611, ERR458612, ERR458613, ERR458614, ERR458615, ERR458616, ERR458617, ERR458618, ERR458619, ERR458620, ERR458621, ERR458622, ERR458623, ERR458624, ERR458625, ERR458626, ERR458630, ERR458633, ERR458637, ERR458641, ERR458642, ERR458653, ERR458654, ERR458659, ERR458661, ERR458667, ERR458681, ERR458684, ERR458686, ERR458699, ERR458703, ERR458708, ERR458760, ERR458762, ERR458777, ERR458778, ERR458781, ERR458783, ERR458784, ERR458788, ERR458791, ERR458796, ERR458803, ERR458807, ERR458812, ERR458817, ERR458828, ERR458834, ERR458493, ERR458494, ERR458495, ERR458496, ERR458497, ERR458498, ERR458499, ERR458524, ERR458530, ERR458546, ERR458548, ERR458711, ERR458717, ERR458719, ERR458720, ERR458723, ERR458726, ERR458730, ERR458745, ERR458750, ERR458758, ERR756146, SRR1799393, SRR1799394, SRR1799395, SRR1799396, SRR1799397, SRR1799398, SRR1799399, SRR1799400, SRR1799401, SRR1799402, SRR1799403, SRR1799404, SRR1799405, SRR1799406, SRR1799407, SRR1799408, SRR1799409, SRR1799410, SRR1799411, SRR1799412, SRR1799413, SRR1799414, SRR1799563, SRR1799565, SRR1799574, SRR1799575,

SRR1799576, SRR1799577, SRR1799578, SRR1799579, SRR1799580, SRR1799582,
SRR1799583, SRR1801191, SRR1801281, SRR1801282, SRR1801283, SRR1801286,
SRR1801287, SRR1801288, SRR1801289, SRR1801290, SRR1801291, SRR1801292,
SRR1801379, SRR1801401, SRR1801410, SRR1801411, SRR1801772, SRR1801774,
SRR1801775, SRR1801776, SRR1801778, SRR1801790, SRR1801792, SRR1801794,
SRR1801795, SRR1801796, SRR1801797, SRR1801798, SRR1801799, SRR1801801,
SRR1801803, SRR1801804, SRR1801805, SRR1801806, SRR1801807, SRR1801808,
SRR1801809, SRR1801810, SRR1810214, SRR1810215, SRR1810216, SRR1810217,
SRR1810218, SRR1810219, SRR1810220, SRR1810221, SRR1799293, SRR1799294,
SRR1799295, SRR1799296, SRR1799297, SRR1799298, SRR1799299, SRR1799300,
SRR1799301, SRR1799302, SRR1799303, SRR1799304, SRR1799305, SRR1799306,
SRR1799307, SRR1799308, SRR1799309, SRR1799310, SRR1799311, SRR1799312,
SRR1799313, SRR1799314, SRR1799315, SRR1799316, SRR1799317, SRR1799318,
SRR1799319, SRR1799320, SRR1799321, SRR1799322, SRR1799323, SRR1799324,
SRR1799325, SRR1799326, SRR1799327, SRR1799328, SRR1799329, SRR1799330,
SRR1799331, SRR1799332, SRR1799333, SRR1799334, SRR1799335, SRR1799336,
SRR1799337, SRR1799338, SRR1799339, SRR1799340, SRR1799341, SRR1799342,
SRR1799343, SRR1799344, SRR1799345, SRR1799346, SRR1799347, SRR1799348,
SRR1799349, SRR1799350, SRR1799351, SRR1799352, SRR1799353, SRR1799354,
SRR1799355, SRR1799356, SRR1799357, SRR1799358, SRR1799359, SRR1799360,
SRR1799361, SRR1799362, SRR1799363, SRR1799364, SRR1799365, SRR1799366,
SRR1799367, SRR1799368, SRR1799369, SRR1799370, SRR1799371, SRR1799372,
SRR1799373, SRR1799374, SRR1799375, SRR1799376, SRR1799377, SRR1799378,
SRR1799379, SRR1799380, SRR1799381, SRR1799382, SRR1799383, SRR1799384,
SRR1799385, SRR1799386, SRR1799387, SRR1799388, SRR1799389, SRR1799390,
SRR1799391, SRR1799392, SRR1797161, SRR1797162, SRR1797186, SRR1797190,
SRR1797204, SRR1797364, SRR1797365, SRR1797366, SRR1797367, SRR1797368,
SRR1797370, SRR1797371, SRR1797372, SRR1797373, SRR1797374, SRR1797375,
SRR1797376, SRR1797377, SRR1797378, SRR1797379, SRR1797380, SRR1797381,
SRR1797382, SRR1797383, SRR1797384, SRR1797385, SRR1797386, SRR1797387,
SRR1797388, SRR1797389, SRR1797390, SRR1797397, SRR1797457, SRR1797458,
SRR1797459, SRR1797465, SRR1797466, SRR1797467, SRR1797468, SRR1797469,
SRR1797470, SRR1797479, SRR1797480, SRR1797489, SRR1797490, SRR1797491,
SRR1797492, SRR1797493, SRR1797502, SRR1797503, SRR1797504, SRR1797505,
SRR1797506, SRR1797507, SRR1797508, SRR1797521, SRR1797522, SRR1797523,
SRR1797524, SRR1797525, SRR1797526, SRR1797527, SRR1797528, SRR1797529,
SRR1797530, SRR1797531, SRR1797532, SRR1797535, SRR1797540, SRR1797611,
SRR1798062, SRR1798107, SRR1798110, SRR1798127, SRR1798128, SRR1798129,
SRR1798130, SRR1798131, SRR1798132, SRR1798136, SRR1798137, SRR1798138,
SRR1798139, SRR1798140, SRR1798141, SRR1799172, SRR1799278, SRR1799279,
SRR1799280, SRR1799281, SRR1799282, SRR1799283, SRR1799284, SRR1799285,
SRR1799286, SRR1799287, SRR1799288, SRR1799289, SRR1799290, SRR1799291,

SRR1799292, ERR537561, ERR537562, ERR537563, ERR537564, ERR537565, ERR537566, ERR537567, ERR537568, ERR537569, ERR537570, ERR537571, ERR537572, ERR537573, ERR537574, ERR537575, ERR537576, ERR537577, ERR537578, ERR537579, ERR537580, ERR537581, ERR537582, ERR537583, ERR537584, ERR537585, ERR537586, ERR537587, ERR537588, ERR537589, ERR537590, ERR537591, ERR537592, ERR537593, ERR537594, ERR537595, ERR537596, ERR537597, ERR537598, ERR537599, ERR537600, ERR537601, ERR537602, ERR537603, ERR537604, ERR537605, ERR537606, ERR537607, ERR537608, ERR537609, ERR537610, ERR537611, ERR537612, ERR537613, ERR537614, ERR537615, ERR537616, ERR537617, ERR537618, ERR537619, ERR537620, ERR537621, ERR537622, ERR537623, ERR537624, ERR537625, ERR537626, ERR537627, ERR537628, ERR699559, ERR699560, ERR699561, ERR699562, ERR699563, ERR699565, ERR699566, ERR712307, ERR712308, ERR712309, ERR732538, ERR732539, SRR1771293, SRR1771294, SRR1793203, SRR1796759, SRR1796760, SRR1796761, SRR1796762, SRR1796763, SRR1796764, SRR1796765, SRR1796766, SRR1796767, SRR1796768, SRR1796769, SRR1796770, SRR1796771, SRR1796774, SRR1796783, SRR1796801, SRR1796807, DRR002367, ERR553473, ERR553474, SRR1553672, SRR1695531, SRR1695532, SRR1695533, SRR1695538, SRR1695539, SRR1695540, SRR1695541, SRR1695542, SRR1695543, SRR1695544, SRR1695545, SRR1695546, SRR1695547, SRR1695548, SRR1695549, SRR1695860, SRR1695861, SRR1695862, SRR1695863, SRR1695864, SRR1695865, SRR1695866, SRR1695867, SRR1695868, SRR1695869, SRR1695870, SRR1695871, SRR1695872, SRR1695873, SRR1695874, SRR1695875, SRR1695876, SRR1695877, SRR1695878, SRR1695879, SRR1695880, SRR1695881, SRR1695882, SRR1695884, SRR1695885, SRR1695886, SRR1695887, SRR1695906, SRR1695907, SRR1695908, SRR1695909, SRR1695910, SRR1695911, SRR1705825, SRR1705826, SRR1706009, SRR1706010, SRR1721735, SRR1721736, SRR1721737, SRR1721738, SRR1722638, SRR1722639, SRR1722640, SRR1722641, SRR1723323, SRR1739910, SRR1742983, SRR1745773, SRR1745777, SRR1745787, SRR1752119, SRR1752120, SRR1752121, SRR1752122, SRR1755142, SRR1755143, SRR1755144, SRR1755145, SRR1755146, SRR1755147, SRR1755148, SRR1755149, SRR1755150, SRR1755151, SRR1755152, SRR1755153, SRR1755154, SRR1755155, SRR1755156, SRR1755157, SRR1755158, SRR1755778, SRR1765657, SRR1770405, SRR1770406, SRR1770407, SRR1770408, SRR1770409, SRR1770410, SRR1770411, SRR1771276, SRR1771277, SRR1771278, SRR1771279, SRR1771280, SRR1771281, SRR1771282, SRR1771283, SRR1771284, SRR1771285, SRR1771286, SRR1771287, SRR1771288, SRR1771289, SRR1771290, SRR1771291, SRR1771292, SRR1773423, ERR629120, ERR629121, ERR629122, ERR629123, ERR629124, ERR629125, ERR629126, ERR629127, ERR629128, ERR629129, ERR629130, ERR629131, ERR632515, SRR1135418, SRR1596060, SRR1596062, SRR1596316, SRR1654888, SRR1654889, SRR1654890, SRR1654891, SRR1654892, SRR1654893, SRR1654894, SRR1654895, SRR1654896, SRR1656884, SRR1656885, SRR1656886, SRR1656887, SRR1656888, SRR1656889, SRR1656890, SRR1656891, SRR1656892, SRR1656893, SRR1656894, SRR1656895, SRR1657926, SRR1658454, SRR1658455, SRR1658456, SRR1658457, SRR1658458, SRR1658459,

SRR1658460, SRR1658461, SRR1664214, SRR1664215, SRR1664216, SRR1664217, SRR1664218, SRR1664219, SRR1664220, SRR1664221, SRR1664730, SRR1688540, SRR1688541, SRR1688542, SRR1688543, SRR1688544, SRR1688545, SRR1688546, SRR1688547, SRR1688548, SRR1688549, SRR1693513, SRR1693514, SRR1693515, SRR1693516, SRR1693517, SRR1693518, SRR1693519, SRR1693520, SRR1693521, SRR1693522, SRR1693601, SRR1693602, SRR1693603, SRR1693604, SRR1693605, SRR1693606, SRR1693773, SRR1693836, SRR1693837, SRR1693838, SRR1693839, SRR1695518, SRR1695519, SRR1695520, SRR1695521, SRR1695522, SRR1695523, SRR1695524, SRR1695525, SRR1695526, SRR1695527, SRR1695528, SRR1695529, SRR1695530, DRR003569, DRR003570, DRR003571, DRR003572, DRR003573, ERR375918, ERR375919, ERR375920, ERR375921, ERR391753, ERR391754, ERR391755, ERR391756, ERR391757, ERR391758, ERR391759, ERR391760, ERR391761, ERR391762, ERR391763, ERR391764, ERR391765, ERR391766, ERR391767, ERR391768, ERR391769, ERR391770, ERR391771, ERR391772, SRR1506631, SRR1506632, SRR1506633, SRR1506634, SRR1646703, SRR1646704, SRR1646705, SRR1646706, SRR1646707, SRR1646708, SRR1646709, SRR1646710, SRR1646711, SRR1653293, SRR1653294, SRR1653295, SRR1653296, SRR1653297, SRR1653298, SRR1653299, SRR1653300, SRR1653301, SRR1653302, SRR1653303, SRR1654492, SRR1654493, SRR1654494, SRR1654847, SRR1654848, SRR1654849, SRR1654850, SRR1654851, SRR1654852, SRR1654853, SRR1654854, SRR1654855, SRR1654856, SRR1654857, SRR1654858, SRR1654859, SRR1654860, SRR1654861, SRR1654862, SRR1654863, SRR1654864, SRR1654865, SRR1654866, SRR1654867, SRR1654868, SRR1654869, SRR1654870, SRR1654871, SRR1654872, SRR1654873, SRR1654874, SRR1654875, SRR1654876, SRR1654877, SRR1654878, SRR1654879, SRR1654880, SRR1654881, SRR1654882, SRR1654883, SRR1654884, SRR1654885, SRR1654886, SRR1654887, SRR1655091, SRR1655092, SRR1655093, SRR1655094, SRR1655095, SRR1655096, SRR1655103, SRR1655122, SRR1655123, SRR1655124, SRR1655125, SRR1655126, SRR1655127, SRR1655128, SRR1655129, SRR1655130, SRR1655131, SRR1655132, SRR1655133, SRR1655164, SRR1655165, SRR1655166, SRR1655167, DRR023778, DRR023779, DRR023780, DRR023781, SRR1257637, SRR1257640, SRR1257793, SRR1259267, SRR1259330, SRR1259331, SRR1514794, SRR1514795, SRR1515155, SRR1515156, SRR1515166, SRR1515184, SRR1542394, SRR1575394, SRR1575596, SRR1576665, SRR1576669, SRR1576672, SRR1576709, SRR1576713, SRR1576787, SRR1576788, SRR1581212, SRR1581213, SRR1581214, SRR1581216, SRR1592635, SRR1592636, SRR1592637, SRR1592638, SRR1593998, SRR1593999, SRR1594000, SRR1594001, SRR1594002, SRR1594003, SRR1594004, SRR1594005, SRR1594006, SRR1594007, SRR1594008, SRR1594009, SRR1594010, SRR1594011, SRR1594012, SRR1594013, SRR1594014, SRR1594015, SRR1594016, SRR1594017, SRR1594018, SRR1596318, SRR1605749, SRR1605750, SRR1605751, SRR1605752, SRR1605753, SRR1605754, SRR1605755, SRR1605756, SRR1605757, SRR1605758, SRR1605759, SRR1605760, SRR1609832, SRR1609833, SRR1609834, SRR1609835, SRR1609836, SRR1609837, SRR1609838, SRR1609839, SRR1609840, SRR1609841, SRR1609842, SRR1609843, SRR1609844,

SRR1609845, SRR1609846, SRR1609847, SRR1609848, SRR1609849, SRR1609850,
SRR1609851, SRR1609852, SRR1609853, SRR1609854, SRR1609855, SRR1614079,
SRR1614089, SRR1614090, SRR1614091, SRR1614092, SRR1614093, SRR1616940,
SRR1616941, SRR1616942, SRR1616943, SRR1617246, SRR1617247, SRR1617263,
SRR1617270, SRR1617475, SRR1617476, SRR1617477, SRR1617479, SRR1617480,
SRR1617481, SRR1617484, SRR1617485, SRR1617486, SRR1617488, SRR1631656,
SRR1631657, SRR1631658, SRR1631659, SRR1635514, SRR1635671, SRR1635758,
SRR1635853, SRR1636058, SRR1639172, SRR1639173, SRR1639174, SRR1639175,
SRR1639176, SRR1639665, SRR1646700, SRR1646701, SRR1646702, SRR1588236,
SRR1588237, SRR1588238, SRR1588239, SRR1588240, SRR1588241, SRR1588242,
SRR1588243, SRR1588244, SRR1588245, SRR1588246, SRR1588247, SRR1588248,
SRR1588249, SRR1588250, SRR1588251, SRR1588252, SRR1588253, SRR1588254,
SRR1588255, SRR1588256, SRR1588257, SRR1588258, SRR1588259, SRR1588260,
SRR1588261, SRR1588262, SRR1588263, SRR1588264, SRR1588265, SRR1588266,
SRR1588267, SRR1588268, SRR1588269, SRR1588270, SRR1588271, SRR1588272,
SRR1588273, SRR1588274, SRR1588275, SRR1588276, SRR1588277, SRR1588278,
SRR1588279, SRR1588280, SRR1588281, SRR1588282, SRR1588283, SRR1588284,
SRR1588285, SRR1588286, SRR1588287, SRR1588288, SRR1588289, SRR1588290,
SRR1588291, SRR1588292, SRR1588293, SRR1588294, SRR1588295, SRR1588296,
SRR1588297, SRR1588298, SRR1588299, SRR1588300, SRR1588301, SRR1588302,
SRR1588303, SRR1588304, SRR1588305, SRR1588306, SRR1588307, SRR1588308,
SRR1589642, SRR1589644, SRR1589646, SRR1592416, SRR1592417, SRR1592418,
SRR1592419, SRR1592420, SRR1592421, SRR1592422, SRR1592423, SRR1592424,
SRR1592425, SRR1592426, SRR1592427, SRR1592622, SRR1592623, SRR1592625,
SRR1592626, SRR1592627, SRR1592628, SRR1592629, SRR1592630, SRR1592631,
SRR1592632, SRR1592633, SRR1592634, SRR1587437, SRR1587438, SRR1587439,
SRR1587440, SRR1587637, SRR1587670, SRR1587671, SRR1587679, SRR1587682,
SRR1587696, SRR1587700, SRR1587706, SRR1587739, SRR1587749, SRR1587797,
SRR1587798, SRR1587799, SRR1587800, SRR1587801, SRR1587802, SRR1587803,
SRR1587804, SRR1587805, SRR1587806, SRR1587807, SRR1587808, SRR1587809,
SRR1587810, SRR1587811, SRR1587942, SRR1587956, SRR1587965, SRR1587972,
SRR1587975, SRR1587976, SRR1587977, SRR1587978, SRR1587979, SRR1587980,
SRR1587981, SRR1587982, SRR1587983, SRR1587984, SRR1587985, SRR1587986,
SRR1587987, SRR1587988, SRR1587989, SRR1587990, SRR1587991, SRR1587992,
SRR1588024, SRR1588031, SRR1588032, SRR1588033, SRR1588034, SRR1588035,
SRR1588036, SRR1588037, SRR1588038, SRR1588039, SRR1588040, SRR1588041,
SRR1588042, SRR1588043, SRR1588044, SRR1588045, SRR1588046, SRR1588047,
SRR1588048, SRR1588049, SRR1588050, SRR1588051, SRR1588053, SRR1588056,
SRR1588057, SRR1588061, SRR1588066, SRR1588067, SRR1588071, SRR1588142,
SRR1588143, SRR1588218, SRR1588219, SRR1588220, SRR1588221, SRR1588222,
SRR1588223, SRR1588224, SRR1588225, SRR1588226, SRR1588227, SRR1588228,
SRR1588229, SRR1588230, SRR1588231, SRR1588232, SRR1588233, SRR1588234,

SRR1588235, SRR1583848, SRR1583849, SRR1583850, SRR1583851, SRR1583852, SRR1583853, SRR1583854, SRR1583855, SRR1583856, SRR1583857, SRR1583858, SRR1583859, SRR1583860, SRR1583861, SRR1583862, SRR1583863, SRR1583864, SRR1583865, SRR1583866, SRR1583867, SRR1583868, SRR1583869, SRR1583870, SRR1583871, SRR1583872, SRR1583873, SRR1583874, SRR1583875, SRR1583876, SRR1583877, SRR1583878, SRR1583879, SRR1583880, SRR1583881, SRR1583882, SRR1583883, SRR1583884, SRR1585320, SRR1585321, SRR1585322, SRR1585323, SRR1585324, SRR1585325, SRR1585326, SRR1585327, SRR1585329, SRR1585330, SRR1585331, SRR1585332, SRR1585333, SRR1585334, SRR1585335, SRR1585336, SRR1587312, SRR1587320, SRR1587324, SRR1587325, SRR1587326, SRR1587327, SRR1587328, SRR1587329, SRR1587330, SRR1587331, SRR1587332, SRR1587333, SRR1587334, SRR1587335, SRR1587336, SRR1587337, SRR1587338, SRR1587346, SRR1587354, SRR1587358, SRR1587362, SRR1587365, SRR1587370, SRR1587379, SRR1587405, SRR1587412, SRR1587414, SRR1587415, SRR1587416, SRR1587417, SRR1587418, SRR1587419, SRR1587420, SRR1587421, SRR1587422, SRR1587423, SRR1587424, SRR1587425, SRR1587426, SRR1587427, SRR1587428, SRR1587429, SRR1587430, SRR1587431, SRR1587432, SRR1587433, SRR1587434, SRR1587435, SRR1587436, SRR1811406, SRR1811816, SRR1811833, SRR1811835, SRR1811999, SRR1812000, SRR1812008, SRR1812021, SRR1583747, SRR1583748, SRR1583749, SRR1583750, SRR1583751, SRR1583752, SRR1583753, SRR1583754, SRR1583755, SRR1583756, SRR1583757, SRR1583758, SRR1583759, SRR1583760, SRR1583761, SRR1583762, SRR1583763, SRR1583764, SRR1583765, SRR1583766, SRR1583767, SRR1583768, SRR1583769, SRR1583770, SRR1583771, SRR1583772, SRR1583773, SRR1583774, SRR1583775, SRR1583776, SRR1583777, SRR1583778, SRR1583779, SRR1583780, SRR1583781, SRR1583782, SRR1583783, SRR1583784, SRR1583785, SRR1583786, SRR1583787, SRR1583788, SRR1583789, SRR1583790, SRR1583791, SRR1583792, SRR1583793, SRR1583794, SRR1583795, SRR1583796, SRR1583797, SRR1583798, SRR1583799, SRR1583800, SRR1583801, SRR1583802, SRR1583803, SRR1583804, SRR1583805, SRR1583806, SRR1583807, SRR1583808, SRR1583809, SRR1583810, SRR1583811, SRR1583812, SRR1583813, SRR1583814, SRR1583815, SRR1583816, SRR1583817, SRR1583818, SRR1583819, SRR1583820, SRR1583821, SRR1583822, SRR1583823, SRR1583824, SRR1583825, SRR1583826, SRR1583827, SRR1583828, SRR1583829, SRR1583830, SRR1583831, SRR1583832, SRR1583833, SRR1583834, SRR1583835, SRR1583836, SRR1583837, SRR1583838, SRR1583839, SRR1583840, SRR1583841, SRR1583842, SRR1583843, SRR1583844, SRR1583845, SRR1583846, SRR1583847, ERR412975, ERR412976, ERR412982, ERR412986, ERR412987, ERR412990, ERR412993, ERR412996, SRR1029150, SRR1557010, SRR1557027, SRR1557032, SRR1557040, SRR1557135, SRR1557136, SRR1557137, SRR1557138, SRR1557139, SRR1557140, SRR1570874, SRR1574322, SRR1574324, SRR1575605, SRR1575607, SRR1575608, SRR1576647, SRR1576651, SRR1576668, SRR1576784, SRR1576785, SRR1576786, SRR1576813, SRR1576814, SRR1578116, SRR1580971, SRR1580972, SRR1580973, SRR1580974, SRR1580975, SRR1580976, SRR1580977,

SRR1580978, SRR1580979, SRR1580980, SRR1580981, SRR1580982, SRR1580983, SRR1580984, SRR1582640, SRR1582641, SRR1582642, SRR1582643, SRR1582644, SRR1582645, SRR1582646, SRR1582647, SRR1582648, SRR1582649, SRR1582650, SRR1582651, SRR1582652, SRR1582653, SRR1582654, SRR1582655, SRR1583659, SRR1583660, SRR1583666, SRR1583679, SRR1583680, SRR1583715, SRR1583716, SRR1583717, SRR1583718, SRR1583719, SRR1583720, SRR1583721, SRR1583722, SRR1583723, SRR1583724, SRR1583725, SRR1583726, SRR1583727, SRR1583728, SRR1583729, SRR1583730, SRR1583731, SRR1583732, SRR1583733, SRR1583734, SRR1583735, SRR1583736, SRR1583737, SRR1583738, SRR1583739, SRR1583740, SRR1583741, SRR1583742, SRR1583743, SRR1583744, SRR1583745, SRR1583746, SRR1124793, SRR1562883, SRR1562884, SRR1562885, SRR1562886, SRR1562887, SRR1562888, SRR1562889, SRR1562890, SRR1562891, SRR1562892, SRR1562893, SRR1562894, SRR1562895, SRR1562896, SRR1562897, SRR1562898, SRR1562899, SRR1562900, SRR1562901, SRR1562902, SRR1562903, SRR1562904, SRR1562905, SRR1562906, SRR1562907, SRR1562908, SRR1562909, SRR1562910, SRR1562911, SRR1562912, SRR1562913, SRR1562914, SRR1562915, SRR1562916, SRR1562917, SRR1562918, SRR1562919, SRR1562920, SRR1562921, SRR1562922, SRR1562923, SRR1562924, SRR1562925, SRR1562926, SRR1562927, SRR1562928, SRR1564729, SRR1570808, SRR1570809, SRR1570810, SRR1570811, SRR1570812, SRR1570813, SRR1570814, SRR1570815, SRR1570816, SRR1570817, SRR1570818, SRR1570819, SRR1570820, SRR1570821, SRR1570822, SRR1570823, SRR1570824, SRR1570825, SRR1570826, SRR1570827, SRR1570828, SRR1570829, SRR1570830, SRR1570831, SRR1570832, SRR1570833, SRR1570834, SRR1570835, SRR1570836, SRR1570837, SRR1570838, SRR1570839, SRR1570840, SRR1570841, SRR1570842, SRR1570843, SRR1570844, SRR1570845, SRR1570846, SRR1570847, SRR1570848, SRR1570849, SRR1570850, SRR1570851, SRR1570852, SRR1570853, SRR1570854, SRR1570855, SRR1570856, SRR1570857, SRR1570858, SRR1570859, SRR1570860, SRR1570861, SRR1570862, SRR1570863, SRR1570864, SRR1570865, SRR1570866, SRR1570867, SRR1570868, SRR1570869, SRR1570870, SRR1570871, SRR1570872, SRR1570873, SRR427192, SRR427193, SRR1151605, SRR1152094, SRR1152188, SRR1152190, SRR1152191, SRR1154622, SRR1154623, SRR1154624, SRR1154625, SRR1154626, SRR1154627, SRR1154628, SRR1154629, SRR1555102, SRR1555123, SRR1555294, SRR1555295, SRR1555415, SRR1555416, SRR1555417, SRR1555418, SRR1555419, SRR1555420, SRR1555421, SRR1555422, SRR1555423, SRR1555424, SRR1555425, SRR1555426, SRR1555427, SRR1555428, SRR1555429, SRR1555430, SRR1555431, SRR1555432, SRR1555738, SRR1555739, SRR1555740, SRR1556067, SRR1557190, SRR1557191, SRR1557212, SRR1557213, SRR1557214, SRR1559193, SRR1559194, SRR1559195, SRR1559196, SRR1559197, SRR1559198, SRR1559199, SRR1559200, SRR1559201, SRR1559202, SRR1559203, SRR1559204, SRR1559205, SRR1559206, SRR1559207, SRR1559208, SRR1559209, SRR1559210, SRR1559211, SRR1559212, SRR1559213, SRR1559214, SRR1559215, SRR1559216, SRR1561422, SRR1562049, SRR1562050, SRR1562077, SRR1562078, SRR1562079, SRR1562080, SRR1562081,

SRR1562084, SRR1562085, SRR1562182, SRR1562185, SRR1562247, SRR1562262, SRR1562263, SRR1562549, SRR1562550, SRR1562551, SRR1562552, SRR1562553, SRR1562554, SRR1562873, SRR1562874, SRR1562875, SRR1562876, SRR1562877, SRR1562878, SRR1562879, SRR1562880, SRR1562881, SRR1562882, SRR1578069, SRR364264, SRR364265, SRR364266, SRR394070, SRR394071, SRR394072, SRR1549442, SRR1549443, SRR1549444, SRR1549445, SRR1549446, SRR1549447, SRR1549448, SRR1549449, SRR1549450, SRR1549451, SRR1549452, SRR1549453, SRR1549454, SRR1549455, SRR1549456, SRR1549457, SRR1549458, SRR1549459, SRR1549460, SRR1549461, SRR1549462, SRR1549463, SRR1549464, SRR1549465, SRR1549466, SRR1549467, SRR1549468, SRR1549469, SRR1549470, SRR1549471, SRR1549472, SRR1549473, SRR1549474, SRR1549475, SRR1549476, SRR1549477, SRR1549478, SRR1549479, SRR1549480, SRR1549481, SRR1549482, SRR1549483, SRR1549484, SRR1549485, SRR1549486, SRR1549487, SRR1549488, SRR1549489, SRR1549490, SRR1549491, SRR1549492, SRR1549493, SRR1549494, SRR1549495, SRR1549496, SRR1549497, SRR1549498, SRR1549499, SRR1549500, SRR1549501, SRR1549502, SRR1549503, SRR1549504, SRR1549505, SRR1549506, SRR1549507, SRR1549508, SRR1549509, SRR1549510, SRR1549511, SRR1549512, SRR1549513, SRR1549514, SRR1549515, SRR1549516, SRR1549517, SRR1549518, SRR1549519, SRR1552357, SRR1552358, SRR1552359, SRR1552360, SRR1552361, SRR1552362, SRR1552363, SRR1552364, SRR1552365, SRR1552366, SRR1552367, SRR1552368, SRR1552369, SRR1552370, SRR1552371, SRR1552372, SRR1578070, SRR427196, SRR427197, SRR427198, SRR427199, SRR427200, SRR453572, SRR453573, SRR453574, SRR453575, SRR453576, SRR453577, SRR1549295, SRR1549296, SRR1549297, SRR1549298, SRR1549299, SRR1549300, SRR1549301, SRR1549302, SRR1549303, SRR1549304, SRR1549305, SRR1549306, SRR1549307, SRR1549308, SRR1549309, SRR1549310, SRR1549311, SRR1549312, SRR1549313, SRR1549314, SRR1549315, SRR1549316, SRR1549317, SRR1549318, SRR1549319, SRR1549320, SRR1549321, SRR1549322, SRR1549323, SRR1549324, SRR1549325, SRR1549326, SRR1549327, SRR1549328, SRR1549329, SRR1549330, SRR1549331, SRR1549332, SRR1549333, SRR1549334, SRR1549335, SRR1549336, SRR1549337, SRR1549338, SRR1549339, SRR1549340, SRR1549341, SRR1549342, SRR1549343, SRR1549344, SRR1549345, SRR1549346, SRR1549347, SRR1549348, SRR1549349, SRR1549350, SRR1549351, SRR1549352, SRR1549353, SRR1549354, SRR1549355, SRR1549356, SRR1549357, SRR1549358, SRR1549359, SRR1549360, SRR1549361, SRR1549362, SRR1549363, SRR1549364, SRR1549365, SRR1549366, SRR1549367, SRR1549368, SRR1549369, SRR1549370, SRR1549371, SRR1549372, SRR1549373, SRR1549374, SRR1549375, SRR1549376, SRR1549377, SRR1549378, SRR1549379, SRR1549380, SRR1549381, SRR1549382, SRR1549383, SRR1549384, SRR1549385, SRR1549386, SRR1549387, SRR1549388, SRR1549389, SRR1549390, SRR1549391, SRR1549392, SRR1549393, SRR1549394, SRR1549395, SRR1549396, SRR1549397, SRR1549398, SRR1549399, SRR1549400, SRR1549401, SRR1549402, SRR1549403, SRR1549404, SRR1549405, SRR1549406, SRR1549407, SRR1549408, SRR1549409, SRR1549410, SRR1549411, SRR1549412,

SRR1549413, SRR1549414, SRR1549415, SRR1549416, SRR1549417, SRR1549418, SRR1549419, SRR1549420, SRR1549421, SRR1549422, SRR1549423, SRR1549424, SRR1549425, SRR1549426, SRR1549427, SRR1549428, SRR1549429, SRR1549430, SRR1549431, SRR1549432, SRR1549433, SRR1549434, SRR1549435, SRR1549436, SRR1549437, SRR1549438, SRR1549439, SRR1549440, SRR1549441, SRR1549190, SRR1549191, SRR1549192, SRR1549193, SRR1549194, SRR1549195, SRR1549196, SRR1549197, SRR1549198, SRR1549199, SRR1549200, SRR1549201, SRR1549202, SRR1549203, SRR1549204, SRR1549205, SRR1549206, SRR1549207, SRR1549208, SRR1549209, SRR1549210, SRR1549211, SRR1549212, SRR1549213, SRR1549214, SRR1549215, SRR1549216, SRR1549217, SRR1549218, SRR1549219, SRR1549220, SRR1549221, SRR1549222, SRR1549223, SRR1549224, SRR1549225, SRR1549226, SRR1549227, SRR1549228, SRR1549229, SRR1549230, SRR1549231, SRR1549232, SRR1549233, SRR1549234, SRR1549235, SRR1549236, SRR1549237, SRR1549238, SRR1549239, SRR1549240, SRR1549241, SRR1549242, SRR1549243, SRR1549244, SRR1549245, SRR1549246, SRR1549247, SRR1549248, SRR1549249, SRR1549250, SRR1549251, SRR1549252, SRR1549253, SRR1549254, SRR1549255, SRR1549256, SRR1549257, SRR1549258, SRR1549259, SRR1549260, SRR1549261, SRR1549262, SRR1549263, SRR1549264, SRR1549265, SRR1549266, SRR1549267, SRR1549268, SRR1549269, SRR1549270, SRR1549271, SRR1549272, SRR1549273, SRR1549274, SRR1549275, SRR1549276, SRR1549277, SRR1549278, SRR1549279, SRR1549280, SRR1549281, SRR1549282, SRR1549283, SRR1549284, SRR1549285, SRR1549286, SRR1549287, SRR1549288, SRR1549289, SRR1549290, SRR1549291, SRR1549292, SRR1549293, SRR1549294, ERR184023, ERR184024, ERR184025, ERR184026, ERR184027, ERR267979, ERR267980, ERR267981, ERR318747, ERR318748, ERR318749, ERR357206, ERR357207, ERR357208, ERR357209, ERR359747, ERR359748, ERR359749, ERR359750, ERR359751, ERR359752, ERR359753, ERR359754, ERR364317, ERR392085, ERR392086, ERR392087, ERR392088, ERR392089, ERR392090, ERR392515, ERR392516, ERR392517, ERR392518, ERR392519, ERR392520, ERR392521, ERR392522, ERR392523, ERR392524, ERR392525, ERR392526, ERR392527, ERR392528, ERR414802, ERR414803, ERR414804, ERR414805, ERR414806, ERR414807, ERR472933, ERR472934, ERR472935, ERR472936, ERR472937, ERR472938, ERR472939, ERR472940, ERR472941, ERR472942, ERR472943, ERR472944, ERR472945, ERR472946, ERR472947, ERR472948, ERR475356, SRR1548323, SRR1548324, SRR1548325, SRR1548326, SRR1548327, SRR1548328, SRR1548329, SRR1548330, SRR1548331, SRR1548332, SRR1549166, SRR1549167, SRR1549168, SRR1549169, SRR1549170, SRR1549171, SRR1549172, SRR1549173, SRR1549174, SRR1549175, SRR1549176, SRR1549177, SRR1549178, SRR1549179, SRR1549180, SRR1549181, SRR1549182, SRR1549183, SRR1549184, SRR1549185, SRR1549186, SRR1549187, SRR1549188, SRR1549189, ERR039794, ERR039795, ERR062153, ERR062155, ERR062156, ERR062160, ERR062163, ERR062164, ERR062165, ERR062166, ERR062167, ERR062168, ERR062170, ERR062172, ERR062177, ERR062178, ERR062181, ERR073007, ERR073008, ERR073009, ERR073010, ERR073011, ERR073012, ERR073013, ERR073014, ERR096870, ERR096871, ERR096872, ERR096873, ERR096874, ERR096875,

ERR127154, ERR127156, ERR127157, ERR127158, ERR127160, ERR127161, ERR127162, ERR127164, ERR127165, ERR135872, ERR135873, ERR135874, ERR135875, ERR135876, ERR135877, ERR135878, ERR135879, ERR135880, ERR135881, ERR135906, ERR135907, ERR135908, ERR135909, ERR135910, ERR135911, ERR135912, ERR135913, ERR135914, ERR135915, ERR135916, ERR135917, ERR136935, ERR136936, ERR136937, ERR136938, ERR136939, ERR136940, ERR161594, ERR161595, ERR161596, ERR161597, ERR161598, ERR161599, ERR184028, ERR184029, ERR184030, ERR184031, ERR184032, ERR184033, ERR184034, ERR299572, ERR299574, ERR299576, ERR299578, ERR299580, ERR299582, ERR299584, ERR299586, ERR299588, ERR299590, ERR299592, ERR299594, ERR318746, ERR318750, ERR318752, ERR318753, ERR318754, ERR327972, ERR327973, ERR037676, ERR037677, ERR037678, ERR062152, ERR062154, ERR062157, ERR062158, ERR062159, ERR062161, ERR062162, ERR062169, ERR062171, ERR062173, ERR062174, ERR062175, ERR062176, ERR062179, ERR062180, ERR062182, ERR066901, SRR1169892, SRR1170553, SRR1170555, SRR1170556, SRR1535787, SRR1535788, SRR1535789, SRR1535790, SRR1535791, SRR1535792, SRR1535793, SRR1535794, SRR1535795, SRR1535796, SRR1535797, SRR1535798, SRR1535799, SRR1535800, SRR1535801, SRR1535802, SRR1535803, SRR1535804, SRR1535805, SRR1535806, SRR1535807, SRR1535808, SRR1535809, SRR1535810, SRR1535811, SRR1535812, SRR1535813, SRR1535814, SRR1535815, SRR1535816, SRR1535817, SRR1535818, SRR1535819, SRR1535820, SRR1535821, SRR1535854, SRR1535855, SRR1536283, SRR1536284, SRR1536285, SRR1536286, SRR1536287, SRR1536288, SRR1538684, SRR1538685, SRR1538686, SRR1538687, SRR1538851, SRR1538852, SRR1538853, SRR1538854, SRR1538855, SRR1538856, SRR1538857, SRR1538858, SRR1538859, SRR1538860, SRR1538861, SRR1538862, SRR1538863, SRR1538864, SRR1538865, SRR1538872, SRR1538873, SRR1539282, SRR1539283, SRR1539773, SRR1539774, SRR1539775, SRR1539776, SRR1539777, SRR1539778, SRR1539779, SRR1539780, SRR1539785, SRR1539786, SRR1539787, SRR1539788, SRR1539789, SRR1539790, SRR1539791, SRR1539792, DRR001010, DRR001011, DRR001783, DRR001784, DRR001966, DRR001967, DRR001968, DRR001969, DRR003995, DRR003996, DRR014574, DRR014576, DRR017626, DRR017627, DRR017628, DRR017629, DRR017630, DRR017631, ERR477406, ERR477407, ERR477408, ERR477409, ERR477410, ERR477411, ERR477412, ERR477413, ERR477414, ERR477415, ERR477416, ERR477417, ERR477418, ERR477419, ERR477420, ERR477421, ERR477422, ERR477423, ERR477424, ERR477425, ERR477426, ERR477427, ERR477428, ERR477429, ERR477430, ERR477431, ERR477432, ERR477433, ERR477434, ERR477435, ERR477436, ERR477437, ERR477438, ERR477439, ERR477440, ERR477441, ERR501402, ERR657892, SRR1146600, SRR1523034, SRR1523035, SRR1523036, SRR1523037, SRR1523038, SRR1523039, SRR1523040, SRR1523041, SRR1523042, SRR1523043, SRR1525785, SRR1525786, SRR1525787, SRR1528570, SRR1528571, SRR1528572, SRR1528573, SRR1528574, SRR1528575, SRR1534767, SRR1534768, SRR1534769, SRR1535667, SRR1535750, SRR1535751, SRR1535752, SRR1535753, SRR1535754, SRR1535755, SRR1535756, SRR1535757, SRR1535758, SRR1535759, SRR1535760, SRR1535761, SRR1535762, SRR1535763, SRR1535764, SRR1535765, SRR1535766, SRR1535767,

SRR1535768, SRR1535769, SRR1535770, SRR1535771, SRR1535772, SRR1535773, SRR1535774, SRR1535775, SRR1535776, SRR1535777, SRR1535778, SRR1535779, SRR1535780, SRR1535781, SRR1535782, SRR1535783, SRR1535784, SRR1535785, SRR1535786, SRR1557259, ERR550462, ERR550463, ERR550464, ERR550465, ERR550466, ERR550467, ERR550468, SRR1185280, SRR1185281, SRR1185282, SRR1185283, SRR1185285, SRR1508205, SRR1508209, SRR1508210, SRR1508211, SRR1508480, SRR1508481, SRR1508482, SRR1508483, SRR1508484, SRR1508485, SRR1508486, SRR1508487, SRR1508760, SRR1508761, SRR1508762, SRR1508763, SRR1508764, SRR1508765, SRR1509475, SRR1514319, SRR1514322, SRR1514345, SRR1514346, SRR1514899, SRR1520092, SRR1520311, SRR1520312, SRR1520313, SRR1520314, SRR1520315, SRR1520316, SRR1520317, SRR1520318, SRR1520319, SRR1520320, SRR1520321, SRR1520322, SRR1520323, SRR1520324, SRR1520325, SRR1520326, SRR1520327, SRR1520328, SRR1520329, SRR1520330, SRR1520331, SRR1520332, SRR1520333, SRR1520334, SRR1520695, SRR1520696, SRR1520697, SRR1520698, SRR1520699, SRR1520700, SRR1520701, SRR1520702, SRR1520703, SRR1520704, SRR1520705, SRR1520706, SRR1521461, SRR1521462, SRR1521463, SRR1521464, SRR1521465, SRR1521484, SRR1521485, SRR1521486, SRR1521487, SRR1521983, SRR1522079, SRR1522087, SRR1522088, SRR1523021, SRR1523022, SRR1523023, SRR1523024, SRR1523025, SRR1523026, SRR1523027, SRR1523028, SRR1523029, SRR1523030, SRR1523031, SRR1523032, SRR1523033, SRR1538716, ERR550451, ERR550452, ERR550453, ERR550454, ERR550455, ERR550456, ERR550457, ERR550458, ERR550459, ERR550460, ERR550461, SRR1041289, SRR1041290, SRR1041291, SRR1041292, SRR1041293, SRR1041294, SRR1041295, SRR1041296, SRR1041297, SRR1041298, SRR1041299, SRR1041300, SRR1041301, SRR1041302, SRR1041303, SRR1041304, SRR1041305, SRR1041306, SRR1041307, SRR1041308, SRR1041309, SRR1041310, SRR1041311, SRR1041312, SRR1041313, SRR1041314, SRR1041315, SRR1041316, SRR1041317, SRR1041318, SRR1041319, SRR1041320, SRR1041321, SRR1041322, SRR1041323, SRR1041324, SRR1041325, SRR1041326, SRR1041327, SRR1041328, SRR1041329, SRR1042853, SRR1042854, SRR1042855, SRR1042856, SRR1042857, SRR1042858, SRR1042859, SRR1042860, SRR1042861, SRR1042862, SRR1042863, SRR1042864, SRR1042865, SRR1042866, SRR1042867, SRR1042868, SRR1042869, SRR1042870, SRR1042871, SRR1042872, SRR1042873, SRR1042874, SRR1042875, SRR1042876, SRR1042877, SRR1042878, SRR1042879, SRR1042880, SRR1042881, SRR1333841, SRR1363436, SRR1363437, SRR1363438, SRR1363439, SRR1463382, SRR1463383, SRR1463384, SRR1463385, SRR1463386, SRR1463387, SRR1463388, SRR1463389, SRR1463390, SRR1463391, SRR1463392, SRR1463393, SRR1463394, SRR1463395, SRR1481525, SRR1481526, SRR1481527, SRR1481528, SRR389612, SRR389613, SRR389614, SRR389615, SRR389616, SRR389617, SRR502864, SRR502865, SRR502866, SRR502867, SRR502868, SRR502869, SRR594900, SRR594901, SRR594902, SRR594903, SRR957218, ERR327895, ERR327896, ERR327897, ERR327898, ERR327899, ERR327900, ERR327901, ERR327902, ERR327903, ERR512490, ERR512495, SRR1296968, SRR1296969, SRR1296970, SRR1296971, SRR1302790, SRR1302791,

SRR1302792, SRR1302793, SRR1327186, SRR1327187, SRR1327188, SRR1327189, SRR1327190, SRR1327191, SRR1327192, SRR1327193, SRR1327194, SRR1327195, SRR1327196, SRR1327197, SRR1327198, SRR1327199, SRR1327200, SRR1327201, SRR1327202, SRR1327203, SRR1327204, SRR1327205, SRR1327206, SRR1327207, SRR1327208, SRR1327209, SRR1327210, SRR1327211, SRR1327212, SRR1327213, SRR1327214, SRR1327215, SRR1327216, SRR1327217, SRR1327218, SRR1327219, SRR1327220, SRR1327221, SRR1327222, SRR1327223, SRR1327224, SRR1327225, SRR1327226, SRR1327227, SRR1327228, SRR1327229, SRR1327230, SRR1327231, SRR1327232, SRR1327233, SRR1327234, SRR1327235, SRR1327236, SRR1327237, SRR1327238, SRR1327239, SRR1327240, SRR1327241, SRR1327242, SRR1327243, SRR1327244, SRR1327245, SRR1327246, SRR1327247, SRR1327248, SRR1327249, SRR1327250, SRR1327251, SRR1327252, SRR1333834, SRR1333835, SRR1333836, SRR1339901, SRR1363412, SRR1363413, SRR1363414, SRR1363415, SRR1363416, SRR1363417, SRR1363418, SRR1363419, SRR1363420, SRR1363421, SRR1363422, SRR1363423, SRR1363434, SRR1363435, ERR512491, ERR512492, ERR512493, ERR512494, ERR512496, ERR512497, SRR1269527, SRR1269528, SRR1269529, SRR1269530, SRR1269531, SRR1269532, SRR1269533, SRR1269534, SRR1269537, SRR1269539, SRR1269541, SRR1269542, SRR1269543, SRR1269544, SRR1269545, SRR1269546, SRR1269547, SRR1269652, SRR1269653, SRR1269654, SRR1269655, SRR1269656, SRR1269657, SRR1269658, SRR1269659, SRR1269662, SRR1269663, SRR1269665, SRR1269666, SRR1269667, SRR1269668, SRR1269669, SRR1269670, SRR1269671, SRR1269673, SRR1274031, SRR1274032, SRR1274033, SRR1274034, SRR1274035, SRR1274036, SRR1274037, SRR1274038, SRR1274039, SRR1274040, SRR1274041, SRR1274042, SRR1274043, SRR1274044, SRR1274045, SRR1274046, SRR1274047, SRR1274048, SRR1274049, SRR1274050, SRR1274051, SRR1274052, SRR1274053, SRR1274054, SRR1274055, SRR1274056, SRR1274057, SRR1274058, SRR1274059, SRR1274060, SRR1274061, SRR1274062, SRR1274063, SRR1274064, SRR1274065, SRR1278966, SRR1278967, SRR1278968, SRR1278969, SRR1278970, SRR1278971, SRR1278972, SRR1278973, SRR1278974, SRR1278975, SRR1278976, SRR1278977, SRR1278978, SRR1278979, SRR1278980, SRR1278981, SRR1278982, SRR1278983, SRR1278984, SRR1278985, SRR1278986, SRR1278987, SRR1278988, SRR1278989, SRR1278990, SRR1278991, SRR1283209, SRR1283210, SRR1283215, SRR1283216, SRR1284047, SRR1284048, SRR1284049, SRR1288391, SRR1288392, SRR1288393, SRR1288394, SRR1288395, SRR1288396, SRR1288397, SRR1288398, SRR1288399, SRR1288400, SRR1288401, SRR1288402, SRR1288403, SRR1288404, SRR1288405, SRR1288406, SRR1288407, SRR1288408, SRR1251998, SRR1255547, SRR1256391, SRR1256392, SRR1256393, SRR1257385, SRR1257937, SRR1257938, SRR1258093, SRR1258113, SRR1258114, SRR1258115, SRR1258116, SRR1258470, SRR1258471, SRR1258533, SRR1258534, SRR1258535, SRR1258536, SRR1258537, SRR1258538, SRR1258539, SRR1258540, SRR1258541, SRR1258542, SRR1258543, SRR1258544, SRR1259524, SRR1259525, SRR1259526, SRR1259527, SRR1262984, SRR1262985, SRR1262986, SRR1262987, SRR1262988, SRR1262989, SRR1262990,

SRR1262991, SRR1264806, SRR1264807, SRR1265026, SRR1265027, SRR1265028, SRR1265029, SRR1265030, SRR1265031, SRR1265032, SRR1265033, SRR1265034, SRR1266824, SRR1266825, SRR1266826, SRR1266827, SRR1266828, SRR1266829, SRR1266830, SRR1266831, SRR1266832, SRR1266833, SRR1266834, SRR1266835, SRR1269526, SRR1269535, SRR1269536, SRR1269540, SRR1269548, SRR1269549, SRR1269550, SRR1269551, SRR1269552, SRR1269661, SRR1269664, SRR1269672, SRR1270148, SRR1270408, SRR1270412, SRR1270417, SRR1270420, SRR1270711, SRR1270712, SRR1270713, SRR1270935, SRR1270936, SRR1270937, SRR1270938, SRR1270939, SRR1270940, SRR1270941, SRR1270942, SRR1270943, SRR1270944, SRR1270945, SRR1270946, SRR1270947, SRR1270948, SRR1270949, SRR1270950, SRR1270951, SRR1270952, SRR1270953, SRR1270954, SRR1270955, SRR1270956, SRR1270957, SRR1270958, SRR1270959, SRR1270960, SRR1270961, SRR1270962, SRR1270963, SRR1270964, SRR1270965, SRR1270966, SRR1270967, SRR1270968, SRR1270969, SRR1270970, SRR1270971, SRR1270972, SRR1270973, SRR1270974, SRR1270975, SRR1270976, SRR1270977, SRR1270978, SRR1270979, SRR1270980, SRR1270981, SRR1270982, SRR1271079, SRR1271080, SRR1271081, SRR1271082, SRR1271083, SRR1271084, SRR1271085, SRR1271086, SRR1271087, SRR1271088, SRR1271089, SRR1271090, SRR1271091, SRR1271092, SRR1271093, SRR1271094, SRR1271095, SRR1271096, SRR1271097, SRR1271098, SRR1271099, SRR1271100, SRR1271101, SRR1271102, SRR1274026, SRR1274027, SRR1274028, SRR1274029, SRR1274030, SRR1237060, SRR1237061, SRR1237062, SRR1237068, SRR1237069, SRR1237070, SRR1237071, SRR1237072, SRR1237073, SRR1237074, SRR1237075, SRR1237077, SRR1237078, SRR1237079, SRR1237080, SRR1237082, SRR1237084, SRR1237085, SRR1237086, SRR1237087, SRR1237090, SRR1237091, SRR1237092, SRR1237094, SRR1237095, SRR1237097, SRR1237098, SRR1237099, SRR1237101, SRR1237102, SRR1237103, SRR1237104, SRR1237107, SRR1237108, SRR1237110, SRR1237111, SRR1237112, SRR1237113, SRR1237114, SRR1237115, SRR1237116, SRR1237117, SRR1237118, SRR1237119, SRR1237120, SRR1237121, SRR1237122, SRR1237123, SRR1237124, SRR1237125, SRR1237147, SRR1237163, SRR1237164, SRR1237165, SRR1237170, SRR1237171, SRR1237178, SRR1237179, SRR1237187, SRR1237188, SRR1237191, SRR1237196, SRR1237197, SRR1237199, SRR1237200, SRR1237204, SRR1237205, SRR1237206, SRR1237207, SRR1237208, SRR1237211, SRR1237212, SRR1237214, SRR1237280, SRR1237283, SRR1237284, SRR1237285, SRR1237291, SRR1237292, SRR1237293, SRR1237299, SRR1237307, SRR1237308, SRR1237313, SRR1237314, SRR1237315, SRR1237323, SRR1237324, SRR1237325, SRR1237357, SRR1237358, SRR1237359, SRR1237360, SRR1237361, SRR1237362, SRR1237363, SRR1237364, SRR1237365, SRR1237366, SRR1237367, SRR1237368, SRR1237369, SRR1237370, SRR1237371, SRR1237372, SRR1237373, SRR1237374, SRR1237375, SRR1237376, SRR1237377, SRR1237378, SRR1237379, SRR1237380, SRR1237381, SRR1237382, SRR1237383, SRR1237384, SRR1237385, SRR1237386, SRR1237387, SRR1237388, SRR1237389, SRR1237390, SRR1237391, SRR1237392, SRR1237393, SRR1237394, SRR1237395, SRR1237396, SRR1237397, SRR1237398,

SRR1237399, SRR1237400, SRR1237401, SRR1237402, SRR1237403, SRR1237404, SRR1237405, SRR1237406, SRR1237407, SRR1237408, SRR1237409, SRR1237410, SRR1237411, SRR1237412, SRR1237413, SRR1237414, SRR1237415, SRR1237416, SRR1237417, SRR1237418, SRR1237419, SRR1237420, SRR1237421, SRR1237422, SRR1237423, SRR1237424, SRR1237425, SRR1237426, SRR1237427, SRR1237428, SRR1237429, SRR1237430, SRR1237431, SRR1237432, SRR1237433, SRR1237434, SRR1237435, SRR1237436, SRR1237437, SRR1237438, SRR1237439, SRR1237440, SRR1237441, SRR1237442, SRR1237443, SRR1237444, SRR1237445, SRR1237446, SRR1237447, SRR1237448, SRR1237449, SRR1237450, SRR1237451, SRR1237452, SRR1237453, SRR1237454, SRR1237455, SRR1237456, SRR1237457, SRR1237458, SRR1237459, SRR1237460, SRR1237461, SRR1237462, SRR1237463, SRR1237464, SRR1237465, SRR1237466, SRR1237467, SRR1237468, SRR1237469, SRR1237470, SRR1237471, SRR1237472, SRR1237473, SRR1237474, SRR1237475, SRR1237476, SRR1237477, SRR1237478, SRR1237479, SRR1237480, SRR1237709, SRR1237711, SRR1237712, SRR1237719, SRR1237720, SRR1237727, SRR1237735, SRR1237736, SRR1237743, SRR1237748, SRR1237749, SRR1237754, SRR1237755, SRR1237756, SRR1237757, SRR1237758, SRR1237759, SRR1237760, SRR1237761, SRR1237762, SRR1237763, SRR1237764, SRR1237827, SRR1237938, SRR1237939, SRR1273429, SRR1273793, SRR1273794, SRR1273795, SRR1273802, SRR1273803, SRR1273804, SRR1273813, SRR1273814, SRR1274980, SRR1274989, ERR406384, ERR406385, SRR1197141, SRR1197142, SRR1197143, SRR1197144, SRR1197145, SRR1197146, SRR1197147, SRR1197148, SRR1197973, SRR1197974, SRR1197975, SRR1197976, SRR1197977, SRR1197978, SRR1197979, SRR1197980, SRR1198296, SRR1198297, SRR1198298, SRR1198299, SRR1198300, SRR1198301, SRR1198315, SRR1198316, SRR1198317, SRR1198318, SRR1198319, SRR1198662, SRR1198663, SRR1198664, SRR1198665, SRR1198666, SRR1198667, SRR1198668, SRR1199595, SRR1199596, SRR1200527, SRR1200528, SRR1200529, SRR1200530, SRR1200979, SRR1200980, SRR1201634, SRR1201728, SRR1201729, SRR1201732, SRR1201735, SRR1201740, SRR1201741, SRR1201746, SRR1201747, SRR1201748, SRR1201988, SRR1201990, SRR1201992, SRR1201993, SRR1203995, SRR1204462, SRR1204463, SRR1207063, SRR1207067, SRR1209506, SRR1209507, SRR1209508, SRR1209509, SRR1209510, SRR1209511, SRR1212399, SRR1212400, SRR1212401, SRR1212402, SRR1212403, SRR1212404, SRR1212405, SRR1212406, SRR1212407, SRR1223686, SRR1223687, SRR1223688, SRR1223689, SRR1223690, SRR1223691, SRR1223692, SRR1223693, SRR1223694, SRR1223695, SRR1223696, SRR1223697, SRR1223698, SRR1223699, SRR1223700, SRR1223701, SRR1223702, SRR1223703, SRR1223704, SRR1223705, SRR1223706, SRR1232601, SRR1232602, SRR1232630, SRR1232631, SRR1232632, SRR1232674, SRR1237030, SRR1237032, SRR1237033, SRR1237038, SRR1237039, SRR1237040, SRR1237047, SRR1237048, SRR1237053, SRR1237054, SRR1237055, SRR1237076, SRR1237081, SRR1237083, SRR1237088, SRR1237089, SRR1237093, SRR1237096, SRR1237100, SRR1237105, SRR1237106, SRR1237109, ERR392403, ERR392404, ERR392405, ERR392406, ERR392407, ERR392408, ERR392409, ERR392410,

SRR1177457, SRR1177458, SRR1177459, SRR1177460, SRR1177461, SRR1177462, SRR1177463, SRR1177464, SRR1177465, SRR1177466, SRR1177467, SRR1177468, SRR1177469, SRR1177470, SRR1177471, SRR1177472, SRR1177473, SRR1177474, SRR1177475, SRR1177476, SRR1177477, SRR1177478, SRR1177479, SRR1177480, SRR1177481, SRR1177482, SRR1177483, SRR1177484, SRR1177485, SRR1177486, SRR1177487, SRR1177488, SRR1177489, SRR1177490, SRR1177491, SRR1177492, SRR1177493, SRR1177494, SRR1177495, SRR1177496, SRR1177497, SRR1177498, SRR1177499, SRR1177500, SRR1177501, SRR1177502, SRR1177503, SRR1177504, SRR1177505, SRR1177506, SRR1177507, SRR1177508, SRR1177509, SRR1177510, SRR1177511, SRR1177512, SRR1177513, SRR1177514, SRR1177515, SRR1177516, SRR1177517, SRR1177518, SRR1177519, SRR1177520, SRR1177521, SRR1177522, SRR1177523, SRR1177524, SRR1177525, SRR1177526, SRR1177527, SRR1177528, SRR1177529, SRR1177530, SRR1177531, SRR1177532, SRR1177533, SRR1177534, SRR1177535, SRR1177536, SRR1177537, SRR1177538, SRR1177539, SRR1177540, SRR1177541, SRR1177847, SRR1177848, SRR1177849, SRR1177850, SRR1179892, SRR1179893, SRR1179894, SRR1179895, SRR1179896, SRR1179897, SRR1182759, SRR1182760, SRR1182761, SRR1184257, SRR1184258, SRR1184259, SRR1184268, SRR1184269, SRR1184270, SRR1184271, SRR1184272, SRR1184273, SRR1184274, SRR1184276, SRR1184277, SRR1184278, SRR1184279, SRR1184280, SRR1184281, SRR1184282, SRR1184283, SRR1184284, SRR1184285, SRR1184286, SRR1184402, SRR1184403, SRR1184404, SRR1184405, SRR1184406, SRR1184407, SRR1184408, SRR1184409, SRR1184410, SRR1184411, SRR1184412, SRR1184414, SRR1184415, SRR1186042, SRR1186043, SRR1186044, SRR1186070, SRR1186071, SRR1186072, SRR1186073, SRR1186074, SRR1186075, SRR1186076, SRR1186077, SRR1186078, SRR1186079, SRR1186223, SRR1186224, SRR1186225, SRR1186226, SRR1186227, SRR1186228, SRR1186229, SRR1186230, SRR1186231, SRR1186232, SRR1186233, SRR1190356, SRR1190357, SRR1190358, SRR1190359, SRR1197137, SRR1197138, SRR1197139, SRR1197140, SRR1171035, SRR1171040, SRR1171043, SRR1171044, SRR1171045, SRR1171046, SRR1171047, SRR1171641, SRR1172277, SRR1172283, SRR1172295, SRR1172307, SRR1172325, SRR1172337, SRR1172354, SRR1172360, SRR1172361, SRR1172373, SRR1172374, SRR1172376, SRR1172379, SRR1172384, SRR1172385, SRR1172386, SRR1172388, SRR1172389, SRR1172390, SRR1172391, SRR1172395, SRR1172396, SRR1172397, SRR1172398, SRR1172401, SRR1172403, SRR1172404, SRR1172407, SRR1172408, SRR1172409, SRR1172413, SRR1172414, SRR1172415, SRR1172418, SRR1172419, SRR1172420, SRR1172421, SRR1172425, SRR1172426, SRR1172427, SRR1172428, SRR1172429, SRR1172433, SRR1172434, SRR1172439, SRR1172450, SRR1172594, SRR1172596, SRR1172657, SRR1172658, SRR1172659, SRR1172663, SRR1172664, SRR1172665, SRR1172670, SRR1172671, SRR1172672, SRR1172676, SRR1172677, SRR1172678, SRR1172682, SRR1172683, SRR1172810, SRR1172866, SRR1172964, SRR1172966, SRR1173002, SRR1173992, SRR1173993, SRR1173994, SRR1173995, SRR1174843, SRR1174844, SRR1174845, SRR1175261, SRR1175267, SRR1175268, SRR1175273, SRR1175274, SRR1175760,

SRR1175763, SRR1175764, SRR1175765, SRR1175766, SRR1175767, SRR1175768, SRR1175769, SRR1177156, SRR1177157, SRR1177158, SRR1177159, SRR1177160, SRR1177161, SRR1177162, SRR1177163, SRR1177393, SRR1177394, SRR1177395, SRR1177396, SRR1177397, SRR1177398, SRR1177399, SRR1177400, SRR1177401, SRR1177402, SRR1177403, SRR1177404, SRR1177405, SRR1177406, SRR1177407, SRR1177408, SRR1177409, SRR1177410, SRR1177411, SRR1177412, SRR1177413, SRR1177414, SRR1177415, SRR1177416, SRR1177417, SRR1177418, SRR1177419, SRR1177420, SRR1177421, SRR1177422, SRR1177423, SRR1177424, SRR1177425, SRR1177426, SRR1177427, SRR1177428, SRR1177429, SRR1177430, SRR1177431, SRR1177432, SRR1177433, SRR1177434, SRR1177435, SRR1177436, SRR1177437, SRR1177438, SRR1177439, SRR1177440, SRR1177441, SRR1177442, SRR1177443, SRR1177444, SRR1177445, SRR1177446, SRR1177447, SRR1177448, SRR1177449, SRR1177450, SRR1177451, SRR1177452, SRR1177453, SRR1177454, SRR1177455, SRR1177456, ERR299604, ERR299605, ERR299606, ERR299607, ERR299608, ERR299609, ERR299610, ERR299611, ERR313021, ERR313022, SRR1162735, SRR1164276, SRR1164277, SRR1164278, SRR1164279, SRR1164280, SRR1164281, SRR1164282, SRR1164283, SRR1164284, SRR1164285, SRR1164286, SRR1164287, SRR1164288, SRR1164289, SRR1164290, SRR1164291, SRR1164292, SRR1164293, SRR1164294, SRR1164295, SRR1164296, SRR1164297, SRR1164298, SRR1164299, SRR1164300, SRR1164301, SRR1164302, SRR1164303, SRR1164304, SRR1164305, SRR1164306, SRR1164307, SRR1164308, SRR1164309, SRR1164310, SRR1164311, SRR1164312, SRR1164313, SRR1164314, SRR1164315, SRR1164316, SRR1164317, SRR1164318, SRR1164319, SRR1164320, SRR1164321, SRR1164322, SRR1164323, SRR1164324, SRR1164325, SRR1164326, SRR1164327, SRR1164328, SRR1164329, SRR1164330, SRR1164331, SRR1164332, SRR1164333, SRR1164334, SRR1164335, SRR1164336, SRR1164337, SRR1164338, SRR1164339, SRR1164340, SRR1164341, SRR1164342, SRR1164343, SRR1164344, SRR1164345, SRR1164346, SRR1164347, SRR1164348, SRR1164349, SRR1164350, SRR1164351, SRR1164352, SRR1164353, SRR1164354, SRR1164355, SRR1164356, SRR1164357, SRR1164358, SRR1164359, SRR1164360, SRR1164361, SRR1164362, SRR1164363, SRR1164364, SRR1164365, SRR1164366, SRR1164367, SRR1164368, SRR1164369, SRR1164370, SRR1164371, SRR1164372, SRR1164373, SRR1164374, SRR1164375, SRR1164376, SRR1164377, SRR1165053, SRR1166530, SRR1166531, SRR1166706, SRR1167716, SRR1167717, SRR1167718, SRR1167719, SRR1167720, SRR1167721, SRR1167722, SRR1167723, SRR1167724, SRR1168456, SRR1168565, SRR1168573, SRR1169266, SRR1169278, SRR1169291, SRR1169297, SRR1169311, SRR1169316, SRR1169318, SRR1169342, SRR1169344, SRR1169361, SRR1169375, SRR1169392, SRR1169397, SRR1172024, SRR1172041, SRR1172049, SRR1172076, SRR1172077, SRR1172078, SRR1172126, SRR1172132, SRR1172137, SRR1172153, SRR1172160, SRR1172216, SRR1172222, SRR1172236, SRR1172248, SRR1172255, SRR1172262, SRR1172271, SRR1172324, SRR1172331, SRR1172369, SRR1172445, SRR1174893, SRR1164076, SRR1164077, SRR1164078, SRR1164079, SRR1164080, SRR1164081, SRR1164082, SRR1164083, SRR1164084,

SRR1163937, SRR1163938, SRR1163939, SRR1163940, SRR1163941, SRR1163942, SRR1163943, SRR1163944, SRR1163945, SRR1163946, SRR1163947, SRR1163948, SRR1163949, SRR1163950, SRR1163951, SRR1163952, SRR1163953, SRR1163954, SRR1163955, SRR1163956, SRR1163957, SRR1163958, SRR1163959, SRR1163960, SRR1163961, SRR1163962, SRR1163963, SRR1163964, SRR1163965, SRR1163966, SRR1163967, SRR1163968, SRR1163969, SRR1163970, SRR1163971, SRR1163972, SRR1163973, SRR1163974, SRR1163975, SRR1163976, SRR1163977, SRR1163978, SRR1163979, SRR1163980, SRR1163981, SRR1163982, SRR1163983, SRR1163984, SRR1163985, SRR1163986, SRR1163987, SRR1163988, SRR1163989, SRR1163990, SRR1163991, SRR1163992, SRR1163993, SRR1163994, SRR1163995, SRR1163996, SRR1163997, SRR1163998, SRR1163999, SRR1164000, SRR1164001, SRR1164002, SRR1164003, SRR1164004, SRR1164005, SRR1164006, SRR1164007, SRR1164008, SRR1164009, SRR1164010, SRR1164011, SRR1164012, SRR1164013, SRR1164014, SRR1164015, SRR1164016, SRR1164017, SRR1164018, SRR1164019, SRR1164020, SRR1164021, SRR1164022, SRR1164023, SRR1164024, SRR1164025, SRR1164026, SRR1164027, SRR1164028, SRR1164029, SRR1164030, SRR1164031, SRR1164032, SRR1164033, SRR1164034, SRR1164035, SRR1164036, SRR1164037, SRR1164038, SRR1164039, SRR1164040, SRR1164041, SRR1164042, SRR1164043, SRR1164044, SRR1164045, SRR1164046, SRR1164047, SRR1164048, SRR1164049, SRR1164050, SRR1164051, SRR1164052, SRR1164053, SRR1164054, SRR1164055, SRR1164056, SRR1164057, SRR1164058, SRR1164059, SRR1164060, SRR1164061, SRR1164062, SRR1164063, SRR1164064, SRR1164065, SRR1164066, SRR1164067, SRR1164068, SRR1164069, SRR1164070, SRR1164071, SRR1164072, SRR1164073, SRR1164074, SRR1164075, SRR1151429, SRR1153304, SRR1158613, SRR1158614, SRR1158615, SRR1158616, SRR1158617, SRR1158618, SRR1158619, SRR1158620, SRR1161546, SRR1161547, SRR1161548, SRR1162690, SRR1162693, SRR1162703, SRR1162706, SRR1162712, SRR1162713, SRR1162714, SRR1162715, SRR1162719, SRR1162724, SRR1162729, SRR1162730, SRR1162736, SRR1162742, SRR1162752, SRR1162757, SRR1162761, SRR1162767, SRR1162768, SRR1162772, SRR1162776, SRR1162777, SRR1162790, SRR1162791, SRR1163722, SRR1163723, SRR1163724, SRR1163725, SRR1163726, SRR1163727, SRR1163728, SRR1163729, SRR1163730, SRR1163731, SRR1163732, SRR1163733, SRR1163734, SRR1163735, SRR1163736, SRR1163737, SRR1163738, SRR1163739, SRR1163740, SRR1163741, SRR1163742, SRR1163743, SRR1163744, SRR1163745, SRR1163746, SRR1163747, SRR1163748, SRR1163749, SRR1163750, SRR1163751, SRR1163752, SRR1163753, SRR1163754, SRR1163755, SRR1163756, SRR1163757, SRR1163758, SRR1163759, SRR1163760, SRR1163761, SRR1163762, SRR1163763, SRR1163764, SRR1163765, SRR1163766, SRR1163767, SRR1163768, SRR1163769, SRR1163770, SRR1163771, SRR1163772, SRR1163773, SRR1163774, SRR1163775, SRR1163776, SRR1163777, SRR1163778, SRR1163779, SRR1163780, SRR1163781, SRR1163782, SRR1163783, SRR1163784, SRR1163785, SRR1163786, SRR1163787, SRR1163788, SRR1163789, SRR1163790, SRR1163791, SRR1163792, SRR1163793, SRR1163794, SRR1163795, SRR1163796, SRR1163797,

SRR1163798, SRR1163799, SRR1163800, SRR1163801, SRR1163802, SRR1163803, SRR1163804, SRR1163805, SRR1163806, SRR1163807, SRR1163808, SRR1163809, SRR1163810, SRR1163811, SRR1163812, SRR1163813, SRR1163814, SRR1163815, SRR1163816, SRR1163817, SRR1163818, SRR1163819, SRR1163820, SRR1163821, SRR1163822, SRR1163823, SRR1163824, SRR1163825, SRR1163826, SRR1163827, SRR1163828, SRR1163829, SRR1163830, SRR1163831, SRR1163832, SRR1163833, SRR1163834, SRR1163835, SRR1163836, SRR1163837, SRR1163838, SRR1163839, SRR1163840, SRR1163841, SRR1163842, SRR1163843, SRR1163844, SRR1163845, SRR1163846, SRR1163847, SRR1163848, SRR1163849, SRR1163850, SRR1163851, SRR1163852, SRR1163853, SRR1163854, SRR1163855, SRR1163856, SRR1163857, SRR1163858, SRR1163859, SRR1163860, SRR1163861, SRR1163862, SRR1163863, SRR1163864, SRR1163865, SRR1163866, SRR1163867, SRR1163868, SRR1163869, SRR1163870, SRR1163871, SRR1163872, SRR1163873, SRR1163874, SRR1163875, SRR1055991, SRR1055992, SRR1055993, SRR1055994, SRR1057947, SRR1057948, SRR1057949, SRR1057950, SRR1057951, SRR1057952, SRR1057953, SRR1057954, SRR1057955, SRR1058058, SRR1058059, SRR1060361, SRR1061351, SRR1061352, SRR1061353, SRR1063454, SRR1063457, SRR1066657, SRR1066658, SRR1066659, SRR1066660, SRR1066785, SRR1068199, SRR1068200, SRR1068201, SRR1118268, SRR1118269, SRR1118270, SRR1118271, SRR1118272, SRR1118273, SRR1118274, SRR1118275, SRR1118276, SRR1118277, SRR1121434, SRR1121435, SRR1121436, SRR1121437, SRR1121438, SRR1121439, SRR1121440, SRR1121441, SRR1121442, SRR1121443, SRR1121444, SRR1121445, SRR1121446, SRR1121447, SRR1121448, SRR1121449, SRR1121450, SRR1121451, SRR1121452, SRR1121453, SRR1121454, SRR1121455, SRR1121456, SRR1121457, SRR1121458, SRR1125020, SRR1130246, SRR1130249, SRR1130269, SRR1130270, SRR1130271, SRR1130275, SRR1130285, SRR1130286, SRR1130287, SRR1130288, SRR1130289, SRR1130290, SRR1130291, SRR1130297, SRR1130298, SRR1130299, SRR1130300, SRR1130310, SRR1130311, SRR1130312, SRR1130317, SRR1130321, SRR1130322, SRR1130328, SRR1130329, SRR1130330, SRR1130331, SRR1130338, SRR1130340, SRR1130343, SRR1130547, SRR1130552, SRR1130553, SRR1137061, SRR1141251, SRR1145149, SRR1145152, SRR1145173, SRR1145175, SRR1145176, SRR1145177, SRR1145624, SRR1145625, SRR1145648, SRR1145649, SRR1145650, SRR1145661, SRR1145662, SRR1146542, SRR1146543, SRR1146544, SRR1151403, SRR1151404, SRR1151405, SRR1151406, SRR1151407, SRR1151408, SRR1151409, SRR1151410, SRR1151411, SRR1151412, SRR1151413, SRR1151414, SRR1151419, SRR1151420, SRR1151423, SRR1151424, SRR1151425, SRR807361, SRR807362, SRR807363, SRR807364, ERR351446, ERR351447, ERR351448, ERR351449, ERR351450, ERR351454, ERR351455, ERR351456, ERR351457, ERR351458, ERR351459, ERR351460, ERR351461, ERR356433, ERR356434, ERR356435, ERR356436, ERR376108, ERR376109, ERR376110, ERR376111, ERR380554, SRR1032902, SRR1032903, SRR1032904, SRR1032905, SRR1032906, SRR1032907, SRR1032908, SRR1032909, SRR1036417, SRR1036418, SRR1039856, SRR1039857, SRR1040470, SRR1042851, SRR1042852, SRR1043100, SRR1043101, SRR1043102, SRR1043589,

SRR1043590, SRR1043591, SRR1043592, SRR1043593, SRR1043594, SRR1043595, SRR1043596, SRR1043597, SRR1043598, SRR1043599, SRR1043600, SRR1045101, SRR1045104, SRR1045105, SRR1045106, SRR1045107, SRR1045108, SRR1045109, SRR1045110, SRR1045111, SRR1045960, SRR1045961, SRR1045962, SRR1045964, SRR1045965, SRR1045966, SRR1045967, SRR1045968, SRR1045969, SRR1047229, SRR1047230, SRR1047231, SRR1047232, SRR1047233, SRR1047234, SRR1047235, SRR1047236, SRR1047237, SRR1047238, SRR1047239, SRR1047240, SRR1047241, SRR1047242, SRR1047243, SRR1047244, SRR1047245, SRR1047246, SRR1047247, SRR1047248, SRR1047249, SRR1047250, SRR1047251, SRR1047252, SRR1047253, SRR1047254, SRR1047255, SRR1047256, SRR1047257, SRR1047258, SRR1047259, SRR1047260, SRR1047261, SRR1047262, SRR1047263, SRR1047264, SRR1047333, SRR1047334, SRR1047335, SRR1047336, SRR1047337, SRR1047338, SRR1047339, SRR1047340, SRR1047341, SRR1047342, SRR1047343, SRR1047344, SRR1047345, SRR1047346, SRR1047347, SRR1047348, SRR1047349, SRR1047350, SRR1047351, SRR1047352, SRR1047353, SRR1047354, SRR1047355, SRR1047356, SRR1047357, SRR1047358, SRR1047359, SRR1047360, SRR1047361, SRR1047362, SRR1047363, SRR1047364, SRR1047365, SRR1047366, SRR1047367, SRR1047368, SRR1047369, SRR1047370, SRR1047371, SRR1047372, SRR1047373, SRR1047374, SRR1047375, SRR1047376, SRR1047377, SRR1047378, SRR1047379, SRR1047380, SRR1047381, SRR1047382, SRR1047383, SRR1047384, SRR1047385, SRR1047386, SRR1047387, SRR1047388, SRR1047389, SRR1047390, SRR1047391, SRR1047392, SRR1047393, SRR1047394, SRR1047395, SRR1047396, SRR1047397, SRR1047398, SRR1047399, SRR1047400, SRR1047401, SRR1047402, SRR1047403, SRR1047404, SRR1047405, SRR1047406, SRR1047407, SRR1047408, SRR1047409, SRR1047410, SRR1047411, SRR1047412, SRR1047413, SRR1047414, SRR1047415, SRR1047416, SRR1047418, SRR1047419, SRR1047420, SRR1047421, SRR1047422, SRR1047423, SRR1049093, SRR1049415, SRR1049516, SRR1049520, SRR1049521, SRR1055288, SRR1055289, SRR1055985, SRR1055986, SRR1055987, SRR1055988, SRR1055989, SRR1055990, SRR1019785, SRR1019786, SRR1019787, SRR1019788, SRR1019789, SRR1019790, SRR1019791, SRR1019792, SRR1019793, SRR1019794, SRR1019795, SRR1019797, SRR1019798, SRR1019799, SRR1019800, SRR1019801, SRR1019802, SRR1019803, SRR1019804, SRR1019805, SRR1019819, SRR1019822, SRR1019834, SRR1022686, SRR1022869, SRR1024142, SRR1024143, SRR1024144, SRR1024146, SRR1024147, SRR1024148, SRR1024149, SRR1024150, SRR1024151, SRR1024152, SRR1024153, SRR1025973, SRR1025974, SRR1025975, SRR1025976, SRR1025977, SRR1025978, SRR1025979, SRR1025980, SRR1026832, SRR1026833, SRR1026834, SRR1026835, SRR1026836, SRR1026837, SRR1026838, SRR1026839, SRR1026840, SRR1026841, SRR1026842, SRR1027330, SRR1027331, SRR1027607, SRR1027794, SRR1027795, SRR1027796, SRR1027797, SRR1027798, SRR1027846, SRR1027847, SRR1027848, SRR1027849, SRR1027850, SRR1027851, SRR1027885, SRR1028748, SRR1028749, SRR1028750, SRR1028751, SRR1028752, SRR1028753, SRR1028936, SRR1028937, SRR1028938, SRR1028939, SRR1028940, SRR1028941, SRR1028942, SRR1028943,

SRR1028944, SRR1029143, SRR1029144, SRR1029145, SRR1029146, SRR1029147, SRR1029148, SRR1029149, SRR1029151, SRR1029152, SRR1029153, SRR1029154, SRR1029155, SRR1029156, SRR1029157, SRR1029158, SRR1029607, SRR1029608, SRR1029609, SRR1029610, SRR1029611, SRR1029612, SRR1029613, SRR1029614, SRR1029615, SRR1029616, SRR1029617, SRR1029618, SRR1029619, SRR1029620, SRR1029621, SRR1029622, SRR1032192, SRR1032898, SRR1032899, SRR1032901, SRR1019456, SRR1019457, SRR1019458, SRR1019459, SRR1019460, SRR1019461, SRR1019462, SRR1019463, SRR1019464, SRR1019465, SRR1019466, SRR1019467, SRR1019468, SRR1019469, SRR1019470, SRR1019471, SRR1019472, SRR1019473, SRR1019474, SRR1019475, SRR1019476, SRR1019477, SRR1019478, SRR1019479, SRR1019480, SRR1019481, SRR1019482, SRR1019483, SRR1019484, SRR1019485, SRR1019486, SRR1019487, SRR1019488, SRR1019489, SRR1019490, SRR1019491, SRR1019492, SRR1019493, SRR1019494, SRR1019495, SRR1019496, SRR1019497, SRR1019498, SRR1019499, SRR1019500, SRR1019501, SRR1019502, SRR1019503, SRR1019504, SRR1019505, SRR1019506, SRR1019507, SRR1019508, SRR1019509, SRR1019510, SRR1019511, SRR1019512, SRR1019513, SRR1019514, SRR1019515, SRR1019516, SRR1019517, SRR1019518, SRR1019519, SRR1019520, SRR1019734, SRR1019735, SRR1019736, SRR1019737, SRR1019738, SRR1019739, SRR1019740, SRR1019741, SRR1019742, SRR1019743, SRR1019744, SRR1019745, SRR1019746, SRR1019747, SRR1019748, SRR1019749, SRR1019750, SRR1019751, SRR1019752, SRR1019753, SRR1019754, SRR1019755, SRR1019756, SRR1019757, SRR1019758, SRR1019759, SRR1019760, SRR1019761, SRR1019762, SRR1019763, SRR1019764, SRR1019765, SRR1019766, SRR1019767, SRR1019768, SRR1019769, SRR1019770, SRR1019771, SRR1019772, SRR1019773, SRR1019774, SRR1019775, SRR1019776, SRR1019777, SRR1019778, SRR1019779, SRR1019780, SRR1019781, SRR1019782, SRR1019783, SRR1019784, SRR1019796, ERR327534, ERR327535, ERR327536, ERR327537, ERR327538, ERR327539, ERR327540, ERR327541, ERR327542, ERR327543, ERR348556, ERR348557, ERR348558, ERR348559, SRR1002688, SRR1002819, SRR1002820, SRR1002821, SRR1002822, SRR1013447, SRR1013516, SRR1013518, SRR1013533, SRR1013534, SRR1013535, SRR1013536, SRR1013678, SRR1013681, SRR1013684, SRR1013687, SRR1013688, SRR1013691, SRR1013692, SRR1013706, SRR1013707, SRR1013708, SRR1013709, SRR1013715, SRR1013717, SRR1013747, SRR1013748, SRR1013749, SRR1013754, SRR1013755, SRR1013756, SRR1014664, SRR1014966, SRR1014971, SRR1015436, SRR1015437, SRR1015438, SRR1015439, SRR1015440, SRR1015441, SRR1015442, SRR1015443, SRR1015444, SRR1015445, SRR1015446, SRR1015447, SRR1015479, SRR1015480, SRR1015481, SRR1015482, SRR1015483, SRR1015484, SRR1016039, SRR1016040, SRR1016041, SRR1016042, SRR1016043, SRR1016044, SRR1016045, SRR1016046, SRR1016047, SRR1016048, SRR1016049, SRR1016050, SRR1016051, SRR1016052, SRR1016053, SRR1016054, SRR1016055, SRR1016056, SRR1016057, SRR1016058, SRR1016059, SRR1016060, SRR1016061, SRR1016062, SRR1016063, SRR1016064, SRR1016065, SRR1016066, SRR1016067, SRR1016068, SRR1016069, SRR1016070, SRR1016071, SRR1016072,

SRR1016073, SRR1016074, SRR1016075, SRR1016076, SRR1016077, SRR1016078, SRR1016079, SRR1016080, SRR1016081, SRR1016082, SRR1016083, SRR1016084, SRR1016085, SRR1016086, SRR1016087, SRR1016088, SRR1016089, SRR1016090, SRR1016091, SRR1016092, SRR1016093, SRR1016094, SRR1016095, SRR1016096, SRR1016097, SRR1016098, SRR1016099, SRR1016100, SRR1016101, SRR1016102, SRR1016103, SRR1016104, SRR1016105, SRR1016106, SRR1016107, SRR1016108, SRR1016109, SRR1016110, SRR1016111, SRR1016112, SRR1016113, SRR1016114, SRR1016115, SRR1016116, SRR1016117, SRR1016118, SRR1016119, SRR1016120, SRR1016121, SRR1016122, SRR1016123, SRR1016124, SRR1016125, SRR1016126, SRR1016127, SRR1016128, SRR1016129, SRR1016130, SRR1016131, SRR1016132, SRR1016133, SRR1016134, SRR1016135, SRR1016136, SRR1016137, SRR1016138, SRR1016139, SRR1016140, SRR1016141, SRR1016142, SRR1016143, SRR1016144, SRR1016145, SRR1016146, SRR1016147, SRR1016148, SRR1016149, SRR1016150, SRR1016151, SRR1016152, SRR1016153, SRR1016154, SRR1016155, SRR1016156, SRR1016157, SRR1016158, SRR1016159, SRR1016160, SRR1016161, SRR1016162, SRR1016163, SRR1016164, SRR1016165, SRR1016166, SRR1016167, SRR1016168, SRR1016169, SRR1016170, SRR1016171, SRR1016172, SRR1016173, SRR1016174, SRR1016175, SRR1016176, SRR1016177, SRR1016178, SRR1016179, SRR1016180, SRR1016181, SRR1016182, SRR1016183, SRR1016184, SRR1016185, SRR1016186, SRR1016187, SRR1016188, SRR1016189, SRR1016190, SRR1016191, SRR1016192, SRR1016193, SRR1016194, SRR1016195, SRR1016196, SRR1016197, SRR1016198, SRR1016199, SRR1016200, SRR1016201, SRR1016202, SRR1016203, SRR1016204, SRR1016205, SRR1016206, SRR1019454, SRR1019455, SRR941816, SRR941817, SRR941818, SRR941819, SRR941821, SRR941822, SRR941823, SRR941824, SRR941826, SRR941827, SRR941830, SRR941831, SRR941834, SRR941835, SRR941836, SRR941839, SRR941840, SRR941841, SRR941842, SRR941843, SRR941844, SRR941845, SRR941846, SRR941847, SRR999641, SRR999642, SRR999643, SRR871372, SRR871373, SRR871374, SRR882074, SRR882075, SRR882428, SRR882429, SRR882430, SRR882431, SRR891592, SRR891593, SRR899422, SRR899423, SRR899424, SRR924261, SRR924262, SRR927118, SRR927119, SRR927465, SRR927466, SRR927467, SRR927468, SRR927469, SRR927470, SRR935051, SRR935052, SRR935053, SRR935054, SRR935055, SRR935056, SRR935057, SRR935058, SRR935059, SRR935060, SRR941531, SRR941532, SRR941533, SRR941534, SRR941535, SRR941536, SRR941608, SRR941609, SRR941610, SRR941611, SRR944219, SRR944220, SRR944221, SRR944222, SRR944223, SRR944224, SRR944225, SRR944226, SRR944227, SRR944228, SRR944229, SRR944230, SRR944231, SRR944232, SRR944233, SRR944234, SRR944235, SRR944236, SRR944237, SRR944238, SRR944239, SRR944240, SRR944241, SRR944242, SRR944243, SRR944244, SRR944245, SRR944246, SRR944247, SRR944248, SRR944249, SRR944250, SRR944251, SRR944252, SRR944253, SRR944254, SRR944255, SRR944256, SRR944257, SRR944258, SRR944259, SRR944260, SRR944261, SRR944262, SRR944263, SRR944264, SRR999602, SRR999604, SRR999605, SRR999606, SRR999607, SRR999636, SRR999637, SRR999638, SRR999639, SRR999640, SRR828733, SRR828734, SRR828735, SRR828736, SRR828737, SRR828803, SRR828804, SRR828805,

SRR828806, SRR828807, SRR828808, SRR828809, SRR828810, SRR828811, SRR835117, SRR835118, SRR835119, SRR835120, SRR835121, SRR835122, SRR835123, SRR835124, SRR835125, SRR835126, SRR835127, SRR835128, SRR835129, SRR835213, SRR835214, SRR835215, SRR835216, SRR835217, SRR835218, SRR836437, SRR836438, SRR836439, SRR836440, SRR836441, SRR836442, SRR847118, SRR847119, SRR847297, SRR847735, SRR847736, SRR847737, SRR847738, SRR847739, SRR847740, SRR847741, SRR847742, SRR847743, SRR847744, SRR847745, SRR847746, SRR847747, SRR847748, SRR847749, SRR847750, SRR847751, SRR847752, SRR847753, SRR847754, SRR847755, SRR847756, SRR847757, SRR847758, SRR847759, SRR847760, SRR847761, SRR847762, SRR847763, SRR849888, SRR849889, SRR849890, SRR849891, SRR851878, SRR851879, SRR851880, SRR851881, SRR851882, SRR851883, SRR868666, SRR868667, SRR868668, SRR868669, SRR868670, SRR868671, SRR868672, SRR868673, SRR868674, SRR868675, SRR868676, SRR868677, SRR868678, SRR868679, SRR871367, SRR871368, SRR871369, SRR871370, SRR871371, SRR927122, SRR927123, SRR927124, SRR927125, SRR927126, SRR927127, SRR927128, SRR927129, SRR927130, SRR927131, SRR927132, SRR927133, SRR927134, SRR927135, SRR927136, SRR927137, SRR927138, SRR927139, SRR927140, SRR927141, SRR927142, SRR927143, SRR927144, SRR927145, SRR927146, SRR927147, SRR927148, SRR927149, SRR927150, SRR797985, SRR797986, SRR797987, SRR797988, SRR797989, SRR797990, SRR797991, SRR797992, SRR797993, SRR797994, SRR797995, SRR797996, SRR797997, SRR797998, SRR797999, SRR798000, SRR798001, SRR798002, SRR798003, SRR798004, SRR798005, SRR798006, SRR798007, SRR798008, SRR798009, SRR798010, SRR798011, SRR798012, SRR798013, SRR798014, SRR798015, SRR798016, SRR798017, SRR798018, SRR798019, SRR798020, SRR798021, SRR798022, SRR798023, SRR798024, SRR798025, SRR798026, SRR798027, SRR798028, SRR798029, SRR798030, SRR798031, SRR798032, SRR798033, SRR798034, SRR798035, SRR798036, SRR798037, SRR798038, SRR798039, SRR798040, SRR798041, SRR798042, SRR798043, SRR798044, SRR798045, SRR798046, SRR798047, SRR798048, SRR798049, SRR798050, SRR798051, SRR798052, SRR798053, SRR798054, SRR798055, SRR798056, SRR798057, SRR798058, SRR798059, SRR798060, SRR798061, SRR815612, SRR815613, SRR815614, SRR815615, SRR815616, SRR815617, SRR815618, SRR815619, SRR815620, SRR815621, SRR815622, SRR815623, SRR815624, SRR815625, SRR815626, SRR815627, SRR815628, SRR815629, SRR815630, SRR815631, SRR815632, SRR815633, SRR815634, SRR815635, SRR815636, SRR822377, SRR822378, SRR822379, SRR822380, SRR825165, SRR825166, SRR828732, SRR771364, SRR771365, SRR771366, SRR771423, SRR771424, SRR771425, SRR771426, SRR771427, SRR771428, SRR771429, SRR771430, SRR771431, SRR771432, SRR771433, SRR771434, SRR771542, SRR771543, SRR771544, SRR771545, SRR772090, SRR772091, SRR772092, SRR772093, SRR772094, SRR772095, SRR772096, SRR772097, SRR772098, SRR772099, SRR772100, SRR772101, SRR772102, SRR772103, SRR772104, SRR772105, SRR786686, SRR786687, SRR786688, SRR786976, SRR786977, SRR786978, SRR788070, SRR788071, SRR788072, SRR788073, SRR788074, SRR788075, SRR788076, SRR788077, SRR788078, SRR788079, SRR788080, SRR788081, SRR788082, SRR788083, SRR788084, SRR788085, SRR788086, SRR788087, SRR788088, SRR788089, SRR788090, SRR788091, SRR788092,

SRR788093, SRR797950, SRR797951, SRR797952, SRR797953, SRR797954, SRR797955, SRR797956, SRR797957, SRR797958, SRR797959, SRR797960, SRR797961, SRR797962, SRR797963, SRR797964, SRR797965, SRR797966, SRR797967, SRR797968, SRR797969, SRR797970, SRR797971, SRR797972, SRR797973, SRR797974, SRR797975, SRR797976, SRR797977, SRR797978, SRR797979, SRR797980, SRR797981, SRR797982, SRR797983, SRR797984, SRR641271, SRR641272, SRR641273, SRR641274, SRR641275, SRR641276, SRR641277, SRR641950, SRR641951, SRR643875, SRR643876, SRR643877, SRR643878, SRR643879, SRR643881, SRR643882, SRR644524, SRR644525, SRR644526, SRR644527, SRR644528, SRR645936, SRR645937, SRR645938, SRR646636, SRR651979, SRR651980, SRR651981, SRR651982, SRR651983, SRR651984, SRR651985, SRR651986, SRR651987, SRR651988, SRR651989, SRR651990, SRR652952, SRR652953, SRR652954, SRR652955, SRR652956, SRR652957, SRR652958, SRR652959, SRR652960, SRR652961, SRR652962, SRR652963, SRR652964, SRR652965, SRR652966, SRR652967, SRR652968, SRR654072, SRR654073, SRR676514, SRR676515, SRR676516, SRR676517, SRR676518, SRR676519, SRR676520, SRR676521, SRR676522, SRR676523, SRR676524, SRR676525, SRR676526, SRR676527, SRR676528, SRR676529, SRR676530, SRR676531, SRR676532, SRR676533, SRR676534, SRR676535, SRR701791, SRR701792, SRR701793, SRR701794, SRR701795, SRR701796, SRR701797, SRR701798, SRR701799, SRR701800, SRR701801, SRR701802, SRR701803, SRR701804, SRR701805, SRR701806, SRR701807, SRR701808, SRR701809, SRR701810, SRR701811, SRR701812, SRR701813, SRR701814, SRR701815, SRR701816, SRR701817, SRR701818, SRR701819, SRR701820, SRR701821, SRR701822, SRR701823, SRR701824, SRR701825, SRR701826, SRR701827, SRR701828, SRR701829, SRR701830, SRR701831, SRR701832, SRR701833, SRR701834, SRR701835, SRR701836, SRR701837, SRR701838, SRR701839, SRR701840, SRR701841, SRR701842, SRR701843, SRR701844, SRR764963, SRR764964, SRR764965, SRR764966, SRR764967, SRR764968, SRR764969, SRR764970, SRR765751, SRR765752, SRR765753, SRR771361, SRR771362, SRR771363, SRR620404, SRR620405, SRR620406, SRR620407, SRR627506, SRR627507, SRR627508, SRR627509, SRR627510, SRR627511, SRR627512, SRR627513, SRR627514, SRR627515, SRR627516, SRR627517, SRR627934, SRR627935, SRR627936, SRR627937, SRR627938, SRR627939, SRR627940, SRR627941, SRR627942, SRR627943, SRR627944, SRR627945, SRR627946, SRR627947, SRR627948, SRR630474, SRR630475, SRR630476, SRR631014, SRR631015, SRR631016, SRR631017, SRR631018, SRR631019, SRR631020, SRR636633, SRR636634, SRR636635, SRR636636, SRR636637, SRR636638, SRR636639, SRR636640, SRR636641, SRR636642, SRR636643, SRR636644, SRR636645, SRR636646, SRR636647, SRR636648, SRR636649, SRR636650, SRR636702, SRR636703, SRR636704, SRR636705, SRR636706, SRR636707, SRR636708, SRR636709, SRR636710, SRR636711, SRR638568, SRR638569, SRR638570, SRR641210, SRR641211, SRR641212, SRR641213, SRR641214, SRR641215, SRR641216, SRR641217, SRR641218, SRR641219, SRR641220, SRR641221, SRR641222, SRR641223, SRR641224, SRR641225, SRR641226, SRR641227, SRR641228, SRR641229, SRR641230, SRR641231, SRR641232, SRR641233, SRR641234, SRR641235, SRR641236, SRR641237, SRR641238, SRR641239, SRR641240, SRR641241, SRR641242, SRR641243, SRR641244, SRR641245, SRR641246, SRR641247, SRR641248, SRR641249,

SRR641250, SRR641251, SRR641252, SRR641253, SRR641254, SRR641255, SRR641256, SRR641257, SRR641258, SRR641259, SRR641260, SRR641261, SRR641262, SRR641263, SRR641264, SRR641265, SRR641266, SRR641267, SRR641268, SRR641269, SRR641270, SRR546430, SRR546431, SRR546432, SRR546433, SRR546434, SRR546435, SRR547816, SRR547817, SRR547818, SRR547819, SRR554393, SRR554394, SRR554395, SRR554396, SRR567395, SRR567396, SRR567504, SRR567505, SRR567506, SRR567507, SRR567508, SRR567509, SRR567510, SRR567511, SRR570199, SRR570200, SRR575493, SRR575494, SRR575495, SRR575496, SRR575497, SRR575498, SRR575499, SRR575500, SRR585661, SRR585662, SRR585663, SRR585664, SRR585665, SRR585666, SRR585667, SRR585668, SRR585669, SRR585670, SRR585671, SRR585672, SRR585673, SRR585674, SRR585675, SRR585676, SRR593253, SRR593254, SRR593255, SRR593256, SRR593257, SRR593258, SRR593259, SRR593260, SRR593261, SRR593262, SRR593263, SRR593264, SRR593453, SRR593454, SRR593455, SRR593456, SRR593457, SRR593458, SRR593459, SRR594898, SRR594899, SRR604746, SRR604747, SRR604748, SRR604749, SRR604750, SRR604751, SRR604752, SRR604753, SRR609271, SRR609272, SRR616279, SRR616280, SRR616281, SRR616282, SRR616283, SRR616284, SRR616285, SRR616286, SRR619850, SRR620390, SRR620391, SRR620392, SRR620393, SRR620394, SRR620395, SRR620396, SRR620397, SRR620398, SRR620399, SRR620400, SRR620401, SRR620402, SRR620403, SRR621435, SRR621436, SRR517950, SRR517951, SRR517952, SRR517953, SRR517954, SRR517955, SRR518045, SRR518046, SRR518047, SRR518048, SRR518049, SRR518050, SRR518051, SRR518052, SRR518053, SRR518891, SRR518892, SRR518893, SRR518894, SRR518897, SRR518898, SRR518899, SRR518900, SRR518901, SRR518902, SRR518903, SRR518904, SRR518909, SRR518910, SRR518913, SRR518914, SRR518915, SRR518916, SRR518917, SRR518918, SRR518919, SRR518920, SRR518921, SRR518922, SRR518923, SRR518924, SRR527574, SRR527575, SRR527576, SRR527577, SRR527578, SRR527579, SRR527580, SRR527581, SRR527582, SRR527583, SRR527798, SRR537083, SRR537084, SRR537085, SRR537086, SRR537087, SRR537088, SRR537089, SRR537090, SRR537091, SRR537092, SRR537093, SRR537094, SRR537095, SRR537096, SRR537097, SRR537098, SRR539261, SRR539262, SRR539263, SRR539264, SRR539265, SRR539266, SRR539267, SRR539268, SRR539269, SRR539270, SRR539271, SRR539272, SRR539273, SRR539274, SRR539275, SRR539276, SRR539277, SRR539278, SRR539279, SRR539280, SRR539281, SRR539282, SRR539283, SRR539284, SRR539285, SRR539286, SRR539287, SRR539288, SRR539289, SRR539290, SRR544871, SRR544872, SRR544873, SRR545683, SRR545684, SRR546421, SRR546422, SRR546423, SRR546424, SRR546425, SRR546426, SRR546427, SRR546428, SRR546429, SRR400662, SRR400663, SRR402372, SRR402373, SRR402374, SRR402375, SRR402376, SRR402377, SRR402378, SRR402829, SRR402830, SRR402831, SRR402832, SRR402833, SRR402834, SRR441521, SRR441522, SRR441523, SRR441524, SRR447473, SRR447474, SRR447476, SRR447477, SRR447478, SRR447479, SRR447480, SRR447481, SRR447482, SRR447483, SRR447484, SRR447485, SRR448374, SRR448375, SRR448376, SRR448377, SRR448378, SRR448379, SRR448380, SRR448381, SRR448382, SRR448383, SRR492976, SRR492977, SRR492978, SRR492979, SRR493531, SRR493532, SRR493535, SRR493536, SRR495425, SRR495426, SRR495427, SRR495428, SRR499845, SRR499846,

SRR499847, SRR501544, SRR501545, SRR501546, SRR501547, SRR502771, SRR502772, SRR502967, SRR502968, SRR502969, SRR502970, SRR502971, SRR502972, SRR503465, SRR503466, SRR503467, SRR503468, SRR503469, SRR503470, SRR503471, SRR503472, SRR503473, SRR503474, SRR503475, SRR503476, SRR507110, SRR507111, SRR507112, SRR507113, SRR507114, SRR507115, SRR507116, SRR507117, SRR507118, SRR507119, SRR507120, SRR507121, SRR507122, SRR515220, SRR515221, SRR515222, SRR515223, SRR515224, SRR515225, SRR515226, SRR515227, SRR515228, SRR515229, SRR515230, SRR515231, SRR517908, SRR517909, SRR618524, SRR387865, SRR387866, SRR387867, SRR387868, SRR387869, SRR387870, SRR387871, SRR387872, SRR387873, SRR387874, SRR387875, SRR387876, SRR387877, SRR387878, SRR387879, SRR387880, SRR387881, SRR387882, SRR387883, SRR387884, SRR387885, SRR387886, SRR387887, SRR387888, SRR387889, SRR387890, SRR387891, SRR387892, SRR387893, SRR387894, SRR387895, SRR387896, SRR387897, SRR387898, SRR387899, SRR387900, SRR387901, SRR387902, SRR387903, SRR387904, SRR387905, SRR387906, SRR387907, SRR388269, SRR388270, SRR388271, SRR388272, SRR388273, SRR388274, SRR389606, SRR389607, SRR389608, SRR389609, SRR389610, SRR389611, SRR391823, SRR391824, SRR391825, SRR391826, SRR391827, SRR391828, SRR391829, SRR391830, SRR391831, SRR391832, SRR391833, SRR391834, SRR391835, SRR391836, SRR391837, SRR391838, SRR391839, SRR391840, SRR391841, SRR391842, SRR391843, SRR391844, SRR400635, SRR400636, SRR400637, SRR400638, SRR400639, SRR400640, SRR400641, SRR400642, SRR400643, SRR400644, SRR400645, SRR400646, SRR400647, SRR400648, SRR400649, SRR400650, SRR400651, SRR400652, SRR400653, SRR400654, SRR400655, SRR400656, SRR400657, SRR400658, SRR400659, SRR400660, SRR400661, SRR364592, SRR364593, SRR364594, SRR364595, SRR364596, SRR364597, SRR364598, SRR364599, SRR364600, SRR364601, SRR364602, SRR364603, SRR364604, SRR364605, SRR364606, SRR364607, SRR364608, SRR364609, SRR364610, SRR364611, SRR364612, SRR364613, SRR364614, SRR364615, SRR364616, SRR364617, SRR364618, SRR364619, SRR364620, SRR364621, SRR364622, SRR364623, SRR364624, SRR364625, SRR364626, SRR364627, SRR364628, SRR364629, SRR364630, SRR364631, SRR364632, SRR364633, SRR364634, SRR364635, SRR364636, SRR364637, SRR364638, SRR364639, SRR364640, SRR364641, SRR364642, SRR364643, SRR364644, SRR364645, SRR364646, SRR364647, SRR364648, SRR364649, SRR364650, SRR364651, SRR364652, SRR364653, SRR364654, SRR364655, SRR372702, SRR372703, SRR372704, SRR372705, SRR372706, SRR372707, SRR372708, SRR372709, SRR372710, SRR387838, SRR387839, SRR387840, SRR387841, SRR387842, SRR387843, SRR387844, SRR387845, SRR387846, SRR387847, SRR387848, SRR387849, SRR387850, SRR387851, SRR387852, SRR387853, SRR387854, SRR387855, SRR387856, SRR387857, SRR387858, SRR387859, SRR387860, SRR387861, SRR387862, SRR387863, SRR387864, SRR354090, SRR354091, SRR354092, SRR354093, SRR354094, SRR354095, SRR354096, SRR354097, SRR354098, SRR354099, SRR354100, SRR354101, SRR354102, SRR354103, SRR354104, SRR354105, SRR354106, SRR363968, SRR363969, SRR363970, SRR363971, SRR364302, SRR364303, SRR364304, SRR364305, SRR364306, SRR364307, SRR364308, SRR364309, SRR364352, SRR364353, SRR364354, SRR364355, SRR364356, SRR364357, SRR364358, SRR364359,

SRR364389, SRR364390, SRR364391, SRR364392, SRR364393, SRR364394, SRR364395, SRR364396, SRR364397, SRR364398, SRR364399, SRR364400, SRR364401, SRR364402, SRR364403, SRR364404, SRR364405, SRR364406, SRR364407, SRR364408, SRR364409, SRR364535, SRR364536, SRR364537, SRR364538, SRR364539, SRR364540, SRR364541, SRR364542, SRR364543, SRR364544, SRR364545, SRR364546, SRR364547, SRR364548, SRR364549, SRR364550, SRR364551, SRR364552, SRR364553, SRR364554, SRR364555, SRR364556, SRR364557, SRR364558, SRR364559, SRR364560, SRR364561, SRR364562, SRR364563, SRR364564, SRR364565, SRR364566, SRR364567, SRR364568, SRR364569, SRR364570, SRR364571, SRR364572, SRR364573, SRR364574, SRR364575, SRR364576, SRR364577, SRR364578, SRR364579, SRR364580, SRR364581, SRR364582, SRR364583, SRR364584, SRR364585, SRR364586, SRR364587, SRR364588, SRR364589, SRR364590, SRR364591, SRR298848, SRR298849, SRR298850, SRR298851, SRR298852, SRR306516, SRR306517, SRR307706, SRR307707, SRR307708, SRR307709, SRR309220, SRR309221, SRR309222, SRR309223, SRR315117, SRR315118, SRR315125, SRR315126, SRR332049, SRR332050, SRR332051, SRR332052, SRR332256, SRR332257, SRR333731, SRR333732, SRR342245, SRR342246, SRR342247, SRR342248, SRR342249, SRR342250, SRR342339, SRR342340, SRR342865, SRR342866, SRR342867, SRR342868, SRR342869, SRR342870, SRR342871, SRR342872, SRR342873, SRR342874, SRR342875, SRR342876, SRR342877, SRR342878, SRR342879, SRR342880, SRR342881, SRR342882, SRR342883, SRR342884, SRR350922, SRR350923, SRR350924, SRR350925, SRR350926, SRR350927, SRR350928, SRR350929, SRR350930, SRR350931, SRR350932, SRR350933, SRR350934, SRR350935, SRR351329, SRR351330, SRR351331, SRR352253, SRR352254, SRR352255, SRR352256, SRR352257, SRR352258, SRR352259, SRR352260, SRR352261, SRR352262, SRR352263, SRR352264, SRR352265, SRR352266, SRR352267, SRR352268, SRR352269, SRR352270, SRR352271, SRR352272, SRR352273, SRR352274, SRR352275, SRR352276, SRR352277, SRR352278, SRR354085, SRR354086, SRR354087, SRR354088, SRR354089, SRR059172, SRR059173, SRR059174, SRR059175, SRR059176, SRR059177, SRR059178, SRR059179, SRR063372, SRR063373, SRR063374, SRR065072, SRR065073, SRR065074, SRR065075, SRR065076, SRR065180, SRR065181, SRR065182, SRR066398, SRR066399, SRR066400, SRR066401, SRR066402, SRR066403, SRR066404, SRR066405, SRR070576, SRR070577, SRR070578, SRR070579, SRR070580, SRR072814, SRR072815, SRR072816, SRR072817, SRR072818, SRR072819, SRR072820, SRR072821, SRR072822, SRR072823, SRR072824, SRR072825, SRR072826, SRR072827, SRR072828, SRR072829, SRR072830, SRR072831, SRR096441, SRR101401, SRR101402, SRR101403, SRR101404, SRR101405, SRR101406, SRR101407, SRR101408, SRR101409, SRR101410, SRR101411, SRR101412, SRR101413, SRR101414, SRR101415, SRR101416, SRR101417, SRR101418, SRR125861, SRR125862, SRR125863, SRR125864, SRR189065, SRR192302, SRR192303, SRR192304, SRR192305, SRR202029, SRR202030, SRR202031, SRR202032, SRR202033, SRR202034, SRR202035, SRR202036, SRR202037, SRR202038, SRR202039, SRR202040, SRR202041, SRR202042, SRR202043, SRR202044, SRR202951, SRR202952, SRR223526, SRR223527, SRR223528, SRR223529, SRR223530, SRR223531, SRR283857, SRR283858, SRR298683, SRR298684, SRR298685, SRR298686, SRR298687, SRR298688, SRR298689, SRR298690, SRR298691,

SRR298692, SRR298693, SRR298694, SRR298847, SRR030130, SRR030131, SRR030132, SRR030133, SRR030134, SRR030135, SRR030136, SRR030137, SRR030138, SRR030139, SRR030140, SRR030141, SRR030142, SRR030143, SRR030144, SRR035547, SRR035548, SRR035549, SRR035603, SRR035634, SRR035635, SRR035636, SRR035637, SRR035638, SRR035639, SRR035640, SRR035641, SRR035642, SRR035883, SRR035884, SRR035885, SRR035886, SRR035887, SRR035888, SRR035889, SRR035890, SRR035891, SRR035947, SRR035948, SRR035949, SRR035950, SRR035951, SRR035952, SRR035953, SRR035954, SRR035955, SRR035956, SRR035957, SRR035958, SRR035959, SRR039123, SRR039124, SRR039125, SRR039126, SRR039127, SRR039128, SRR039177, SRR039178, SRR039179, SRR039180, SRR039244, SRR039245, SRR039246, SRR039247, SRR039248, SRR039249, SRR039250, SRR039251, SRR039252, SRR039253, SRR039254, SRR039255, SRR039256, SRR039257, SRR039258, SRR039259, SRR039260, SRR039261, SRR039262, SRR039263, SRR039264, SRR039265, SRR039266, SRR039267, SRR039817, SRR040490, SRR040491, SRR040492, SRR040493, SRR042526, SRR042527, SRR042530, SRR042531, SRR042534, SRR043191, SRR043192, SRR043193, SRR043194, SRR048921, SRR059162, SRR059163, SRR059164, SRR059165, SRR059166, SRR059167, SRR059168, SRR059169, SRR059170, SRR059171, SRR063693, SRR065622, SRR065623, ERR229466, SRR040422, SRR040423, SRR040424, SRR051972, SRR051973, SRR051974, SRR051975, SRR051976, SRR051977, SRR051978, SRR057701, SRR057702, SRR057703, SRR057704, SRR057705, SRR057706, SRR057707, SRR081547, SRR081548, SRR081549, SRR081550, SRR081551, SRR081552, SRR081553, SRR081554, SRR081555, SRR081556, SRR099263, SRR099264, SRR099265, SRR099266, SRR099267, SRR100067, SRR100069, SRR100070, SRR100071, SRR100072, SRR100073, SRR100074, SRR100076, SRR100077, SRR100078, SRR100079, SRR100080, SRR100081, SRR100082, SRR100083, SRR100085, SRR100086, SRR100087, SRR100088, SRR100089, SRR100090, SRR100091, SRR100092, SRR100096, SRR100097, SRR112289, SRR112290, SRR112291, SRR190803, SRR190804, SRR190805, SRR190806, SRR254216, SRR254217, SRR254218, SRR960662, SRR960663, SRR960669, SRR960670, SRR960671, SRR960672, SRR960673, SRR960674, SRR960675, SRR960676, SRR960677, SRR960678, SRR960679, SRR960680, SRR960681, SRR960682, SRR960683, SRR960684, SRR960685, SRR960686, SRR960687, SRR960688, SRR960689, SRR960690, SRR960691, SRR960692, SRR960693, SRR960694, SRR960695, SRR960696, SRR960697, SRR960698, SRR960699, SRR960700, SRR960701, SRR960702, SRR960703, SRR960704, SRR960705, SRR960706, SRR974961, SRR975062, SRR976273, SRR976274, SRR976275, SRR976276, SRR976277, SRR976278, SRR1562261, SRR343039, SRR343040, SRR343041, SRR343043, SRR343045, SRR343046, SRR343048, SRR343050, SRR343055, SRR343056, SRR358569, SRR358570, SRR358573, SRR358574, SRR358575, SRR358576, SRR929280, SRR954874, SRR954875, SRR954882, SRR954883, SRR954884, SRR954885, SRR954886, SRR954887, SRR954888, SRR955862, SRR955864, SRR955865, SRR955871, SRR955872, SRR955874, SRR955875, SRR955876, SRR956022, SRR956023, SRR956024, SRR956025, SRR956026, SRR956027, SRR957223, SRR957723, SRR957841, SRR957842, SRR957843, SRR957844, SRR959443, SRR959444, SRR959761, SRR959763, SRR960622, SRR960623, SRR960624, SRR960625, SRR960626, SRR960627, SRR960628, SRR960629, SRR960630, SRR960631, SRR960632,

SRR960633, SRR960634, SRR960635, SRR960636, SRR960637, SRR960638, SRR960639, SRR960640, SRR960641, SRR960642, SRR960643, SRR960644, SRR960645, SRR960646, SRR960647, SRR960648, SRR960649, SRR960650, SRR960651, SRR960652, SRR960653, SRR960654, SRR960655, SRR960656, SRR960657, SRR960658, SRR960659, SRR960660, SRR960661, SRR960664, SRR960665, SRR960666, SRR960667, SRR960668, SRR960707, SRR960708, SRR960709, SRR960710, SRR960711, SRR960712, SRR960713, SRR960714, SRR447598, SRR447599, SRR447600, SRR447601, SRR447602, SRR447603, SRR447604, SRR447605, SRR447606, SRR447607, SRR447608, SRR447609, SRR447610, SRR447611, SRR447612, SRR447613, SRR447614, SRR447615, SRR447616, SRR447617, SRR447618, SRR489756, SRR489757, SRR489758, SRR489759, SRR489760, SRR489761, SRR489762, SRR489763, SRR489764, SRR489765, SRR489766, SRR489767, SRR489768, SRR489769, SRR489770, SRR489771, SRR489772, SRR489773, SRR489774, SRR489775, SRR489776, SRR489777, SRR489778, SRR489779, SRR489780, SRR489781, SRR489782, SRR489783, SRR489784, SRR489785, SRR489786, SRR489787, SRR489788, SRR489789, SRR501074, SRR501075, SRR501076, SRR501077, SRR501078, SRR501079, SRR501080, SRR501081, SRR501082, SRR501083, SRR501084, SRR501085, SRR501086, SRR501087, SRR501088, SRR501089, SRR501090, SRR501091, SRR501092, SRR501093, SRR501094, SRR501095, SRR501096, SRR501097, SRR501098, SRR501099, SRR501100, SRR501101, SRR501102, SRR567695, SRR567696, SRR567697, SRR567698, SRR567699, SRR567700, SRR567701, SRR567702, SRR567703, SRR567704, SRR567705, SRR567706, SRR567707, SRR567708, SRR567709, SRR567710, SRR567711, SRR567712, SRR567713, SRR567714, SRR567715, SRR567716, SRR567717, SRR567718, SRR567719, SRR567720, SRR567721, SRR567722, SRR567723, SRR567724, SRR567725, SRR567726, SRR567727, SRR567728, SRR567729, SRR567730, SRR567731, SRR567732, SRR567733, SRR567734, SRR567735, SRR567736, SRR567737, SRR567738, SRR567739, SRR567740, SRR567741, SRR567742, SRR567743, SRR567744, SRR567745, SRR567746, SRR567747, SRR567748, SRR567749, SRR567750, SRR946591, SRR948286, SRR948287, SRR948288, SRR948289, SRR948290, SRR948547, SRR948548, SRR948549, SRR948550, SRR948551, SRR948552, SRR948553, SRR948554, SRR948555, SRR948556, SRR948557, SRR948558, SRR948559, SRR948560, SRR948561, SRR948562, SRR948563, SRR948564, SRR948835, SRR949060, SRR949145, SRR949270, SRR949601, SRR949624, SRR949902, SRR949903, SRR949916, SRR950093, SRR950197, SRR950198, SRR950450, SRR950452, SRR950758, SRR950896, SRR951828, SRR951829, SRR952352, SRR952353, SRR952354, SRR953535, SRR953536, SRR953537, SRR953538, SRR953539, SRR953540, SRR953541, SRR954869, SRR364979, SRR364981, SRR494733, SRR494734, SRR494735, SRR494736, SRR494737, SRR494738, SRR494739, SRR494740, SRR494741, SRR494742, SRR494743, SRR494744, SRR494745, SRR494746, SRR494747, SRR494748, SRR494749, SRR494750, SRR494751, SRR494752, SRR494753, SRR494754, SRR494755, SRR494756, SRR494757, SRR494758, SRR494759, SRR494760, SRR494761, SRR494762, SRR494763, SRR494764, SRR496331, SRR496332, SRR496333, SRR496334, SRR496335, SRR496336, SRR496337, SRR496338, SRR496339, SRR496340, SRR496341, SRR496342, SRR496343, SRR496344, SRR496345, SRR496346, SRR496347, SRR496348, SRR496349, SRR496350, SRR496351, SRR496352, SRR496353, SRR496354, SRR496385, SRR496627, SRR496628, SRR496925, SRR496926,

SRR496927, SRR496928, SRR496929, SRR496930, SRR496931, SRR496932, SRR496933, SRR496934, SRR496935, SRR496936, SRR496937, SRR496938, SRR496939, SRR496940, SRR496941, SRR496942, SRR496943, SRR496944, SRR496945, SRR496946, SRR496947, SRR496948, SRR496949, SRR496950, SRR496951, SRR496952, SRR496953, SRR496954, SRR496955, SRR496956, SRR496957, SRR496958, SRR496959, SRR496960, SRR496961, SRR496962, SRR496963, SRR496964, SRR505841, SRR505869, SRR513609, SRR513610, SRR513611, SRR513612, SRR513613, SRR513614, SRR513615, SRR513616, SRR513617, SRR513618, SRR513619, SRR513620, SRR513621, SRR513908, SRR513909, SRR513910, SRR513911, SRR513913, SRR513914, SRR513996, SRR513997, SRR513998, SRR709977, SRR710252, SRR710253, SRR710511, SRR710512, SRR720071, SRR720578, SRR724612, SRR927165, SRR928904, SRR928905, SRR929381, SRR929382, SRR929435, SRR933611, SRR933637, SRR933638, SRR933639, SRR942633, SRR942634, SRR944617, SRR944618, SRR944619, SRR944620, SRR944621, SRR944971, SRR944972, SRR944973, SRR944974, SRR944975, SRR945046, SRR945047, SRR945048, SRR945049, SRR945050, SRR945051, SRR945052, SRR945053, SRR945054, SRR945055, SRR945056, SRR945057, SRR945950, SRR527823, SRR554132, SRR554133, SRR554134, SRR554136, SRR554138, SRR554141, SRR554142, SRR554143, SRR554151, SRR554153, SRR554154, SRR554155, SRR554156, SRR554157, SRR554159, SRR554161, SRR554163, SRR554165, SRR554172, SRR554178, SRR554180, SRR554181, SRR554182, SRR554184, SRR554187, SRR554188, SRR554192, SRR554194, SRR554195, SRR554196, SRR554198, SRR554204, SRR554205, SRR554206, SRR554208, SRR554211, SRR554213, SRR554214, SRR554216, SRR554226, SRR554228, SRR554236, SRR554241, SRR554244, SRR554245, SRR554246, SRR563062, SRR563067, SRR563069, SRR563072, SRR563073, SRR563074, SRR563077, SRR563079, SRR563080, SRR563085, SRR563086, SRR563087, SRR563088, SRR563089, SRR563091, SRR563092, SRR563093, SRR563098, SRR563103, SRR563104, SRR563108, SRR563110, SRR563111, SRR563112, SRR563113, SRR563114, SRR563116, SRR563120, SRR563124, SRR563126, SRR563127, SRR563128, SRR563130, SRR563132, SRR563137, SRR563138, SRR563139, SRR563141, SRR563144, SRR563145, SRR563147, SRR563149, SRR563154, SRR563155, SRR563156, SRR563157, SRR563158, SRR563159, SRR563162, SRR563163, SRR563168, SRR563174, SRR563175, SRR563176, SRR563178, SRR563180, SRR563181, SRR563183, SRR563184, SRR563185, SRR563186, SRR563187, SRR563188, SRR563189, SRR563192, SRR563194, SRR563195, SRR563197, SRR563201, SRR563203, SRR563204, SRR563208, SRR563209, SRR563211, SRR563213, SRR563214, SRR563218, SRR563219, SRR563220, SRR563221, SRR563223, SRR563224, SRR563228, SRR563231, SRR563234, SRR563240, SRR563245, SRR563246, SRR563247, SRR563249, SRR563250, SRR563255, SRR563258, SRR563259, SRR563260, SRR563262, SRR563265, SRR563267, SRR563268, SRR563271, SRR563272, SRR563275, SRR639769, SRR639770, SRR639771, SRR639772, SRR639773, SRR639774, SRR639775, SRR639776, SRR639777, SRR639778, SRR646263, SRR646264, SRR646265, SRR646266, SRR646267, SRR646268, SRR646269, SRR646270, SRR646271, SRR649772, SRR649773, SRR649774, SRR649776, SRR649777, SRR649781, SRR649782, SRR649783, SRR649784, SRR649785, SRR649786, SRR649787, SRR649788, SRR649789, SRR649790, SRR649791, SRR649793, SRR649795, SRR649796, SRR649797, SRR649799,

SRR649800, SRR649801, SRR649803, SRR649804, SRR649806, SRR649809, SRR649810, SRR649811, SRR649812, SRR649813, SRR649815, SRR649817, SRR649818, SRR649819, SRR649820, SRR649822, SRR867656, SRR868802, SRR891368, SRR893107, SRR893108, SRR900012, SRR900013, SRR900088, SRR900137, SRR900186, SRR900220, SRR900222, SRR900223, SRR900251, SRR900255, SRR901707, SRR901708, SRR901709, SRR906436, SRR915897, SRR916888, SRR916958, SRR922412, SRR923948, SRR926591, SRR926592, SRR927120, SRR927121, SRR927151, SRR927152, SRR927162, SRR927164, ERR237734, ERR237735, ERR237736, ERR237737, ERR237738, ERR237739, ERR237740, ERR237741, ERR237742, ERR237743, ERR237744, ERR237745, ERR237746, ERR237747, ERR237748, SRR554131, SRR554135, SRR554137, SRR554139, SRR554140, SRR554145, SRR554147, SRR554149, SRR554150, SRR554152, SRR554158, SRR554162, SRR554164, SRR554166, SRR554169, SRR554173, SRR554174, SRR554175, SRR554176, SRR554183, SRR554185, SRR554189, SRR554190, SRR554191, SRR554193, SRR554197, SRR554199, SRR554200, SRR554201, SRR554202, SRR554203, SRR554207, SRR554209, SRR554210, SRR554215, SRR554217, SRR554220, SRR554221, SRR554223, SRR554224, SRR554225, SRR554230, SRR554231, SRR554234, SRR554237, SRR554238, SRR554239, SRR554242, SRR554243, SRR562644, SRR562702, SRR563075, SRR563076, SRR563078, SRR563081, SRR563082, SRR563083, SRR563084, SRR563090, SRR563094, SRR563095, SRR563096, SRR563097, SRR563099, SRR563101, SRR563115, SRR563117, SRR563118, SRR563121, SRR563131, SRR563142, SRR563143, SRR563146, SRR563151, SRR563152, SRR563153, SRR563160, SRR563161, SRR563165, SRR563167, SRR563169, SRR563172, SRR563173, SRR563177, SRR563190, SRR563193, SRR563196, SRR563198, SRR563199, SRR563202, SRR563205, SRR563210, SRR563212, SRR563217, SRR563222, SRR563225, SRR563232, SRR563233, SRR563236, SRR563239, SRR563243, SRR563244, SRR563248, SRR563257, SRR563261, SRR563270, SRR563276, SRR649765, SRR649766, SRR649767, SRR649768, SRR649769, SRR649770, SRR649771, SRR649775, SRR649778, SRR649779, SRR649780, SRR649792, SRR649794, SRR649798, SRR649802, SRR649805, SRR649807, SRR649808, SRR649814, SRR649816, SRR649821, SRR649823, SRR653699, SRR653716, SRR823942, SRR823943, SRR851823, SRR851824, SRR867197, SRR867204, SRR867205, SRR867206, SRR867207, SRR867208, SRR867733, SRR867734, SRR867741, SRR867745, SRR867769, SRR867770, SRR867772, SRR867789, SRR867790, SRR867791, SRR867792, SRR867793, SRR867794, SRR867795, SRR867796, SRR867797, SRR867798, SRR867799, SRR867800, SRR867801, SRR867802, SRR867803, SRR867804, SRR867805, SRR867806, SRR867807, SRR867809, SRR867810, SRR867814, SRR868657, SRR868658, SRR868663, SRR868665, SRR868681, ERR202898, ERR202899, ERR202900, ERR202901, ERR202902, ERR202903, ERR202904, ERR202905, ERR202906, ERR202907, ERR202908, ERR202909, ERR202910, ERR202911, ERR202912, SRR035315, SRR035316, SRR035317, SRR035318, SRR035319, SRR037495, SRR037496, SRR068953, SRR068955, SRR097748, SRR097749, SRR097750, SRR097751, SRR097752, SRR097753, SRR097754, SRR097755, SRR097756, SRR097757, SRR097758, SRR097759, SRR097760, SRR097761, SRR097762, SRR097763, SRR097764, SRR097765, SRR097766, SRR097767, SRR097768, SRR097769, SRR097770, SRR097771, SRR097772, SRR097773, SRR097774, SRR097775, SRR097776, SRR097777, SRR097778, SRR097779,

SRR097897, SRR097898, SRR097899, SRR097900, SRR097901, SRR097902, SRR097903, SRR097904, SRR097905, SRR097906, SRR097907, SRR097908, SRR097909, SRR097910, SRR097911, SRR097912, SRR097913, SRR097914, SRR097915, SRR097916, SRR097917, SRR097918, SRR097919, SRR097920, SRR097921, SRR097922, SRR097923, SRR097924, SRR097925, SRR097926, SRR097927, SRR097928, SRR650410, SRR650411, SRR650412, SRR650413, SRR650414, SRR650415, SRR650416, SRR650417, SRR650418, SRR650419, SRR650421, SRR650422, SRR650423, SRR650424, SRR650425, SRR653612, SRR653615, SRR653633, SRR653650, SRR653660, SRR653661, SRR653676, SRR653677, SRR653678, SRR653689, SRR653779, SRR653780, SRR679634, SRR679736, SRR679748, SRR726232, SRR726239, SRR746797, SRR747027, SRR751454, SRR755946, SRR756251, SRR756354, SRR768316, SRR768317, SRR768721, SRR768722, SRR768723, SRR768724, SRR768903, SRR768904, SRR768905, SRR768907, SRR769604, SRR769605, SRR769606, SRR769607, SRR769608, SRR769609, SRR769610, SRR769748, SRR770293, SRR770294, SRR770295, SRR770302, SRR770304, SRR770307, SRR770308, SRR770311, SRR770313, SRR770315, SRR770319, SRR770340, SRR770343, SRR770344, SRR770471, SRR770475, SRR776487, SRR776516, SRR786676, SRR824248, SRR824257, SRR824258, SRR826684, SRR826685, SRR826686, SRR826821, SRR826823, SRR826824, SRR826827, SRR835448, SRR836081, SRR836082, ERR173576, SRR385720, SRR385730, SRR493691, SRR516231, SRR516233, SRR516235, SRR516236, SRR516239, SRR516240, SRR516241, SRR516242, SRR516243, SRR516244, SRR516245, SRR516246, SRR516832, SRR518537, SRR518563, SRR518564, SRR518565, SRR518566, SRR522911, SRR535782, SRR535787, SRR535788, SRR535789, SRR540018, SRR540019, SRR540020, SRR540021, SRR540022, SRR540024, SRR540025, SRR540026, SRR540027, SRR540028, SRR540029, SRR540030, SRR540175, SRR540176, SRR540177, SRR540178, SRR540179, SRR540180, SRR540181, SRR540182, SRR540183, SRR540184, SRR540185, SRR540186, SRR540369, SRR540370, SRR540423, SRR540589, SRR540590, SRR540631, SRR540632, SRR540633, SRR540824, SRR573903, SRR573904, SRR573907, SRR573908, SRR573909, SRR573910, SRR575673, SRR575675, SRR575676, SRR575677, SRR575678, SRR576282, SRR576283, SRR576284, SRR576285, SRR576294, SRR576295, SRR579379, SRR579533, SRR579534, SRR579535, SRR579536, SRR579537, SRR579538, SRR579539, SRR579540, SRR592710, SRR592711, SRR592712, SRR592713, SRR609082, SRR609193, SRR610531, SRR610532, SRR610533, SRR610534, SRR610535, SRR610536, SRR610537, SRR610538, SRR610539, SRR610540, SRR610541, SRR610542, SRR610543, SRR610544, SRR610545, SRR610546, SRR612168, SRR612169, SRR612170, SRR612171, SRR612173, SRR612174, SRR612175, SRR616699, SRR616700, SRR619832, SRR620549, SRR627487, SRR630525, SRR631745, SRR631746, SRR646422, SRR646423, SRR650384, SRR650385, SRR650404, SRR650405, SRR650406, SRR650407, SRR650408, SRR650409, SRR014850, SRR385721, SRR385722, SRR385724, SRR385726, SRR385729, SRR424213, SRR424214, SRR424215, SRR424216, SRR424218, SRR424346, SRR424348, SRR424568, SRR424571, SRR424574, SRR424669, SRR424670, SRR425769, SRR426839, SRR427135, SRR427150, SRR427151, SRR427152, SRR427156, SRR427157, SRR427158, SRR427159, SRR427161, SRR427162, SRR427163, SRR427164, SRR427165, SRR427169, SRR427170, SRR427172, SRR427173, SRR427195, SRR444083, SRR444084, SRR444085,

SRR444086, SRR444087, SRR444088, SRR444089, SRR444090, SRR444091, SRR444092, SRR444093, SRR444094, SRR444095, SRR444096, SRR444097, SRR444098, SRR444099, SRR444100, SRR444101, SRR444102, SRR444103, SRR444104, SRR444105, SRR444106, SRR444107, SRR444108, SRR445220, SRR446707, SRR449073, SRR449307, SRR449429, SRR449430, SRR453414, SRR453415, SRR453566, SRR453567, SRR453568, SRR453569, SRR453570, SRR453571, SRR478538, SRR485866, SRR485868, SRR485869, SRR485870, SRR486612, SRR486614, SRR488139, SRR488140, SRR488141, SRR488142, SRR488143, SRR488144, SRR488145, SRR488146, SRR488154, SRR488336, SRR488350, SRR490119, SRR490922, SRR492869, SRR492870, SRR492918, SRR493533, SRR494179, SRR494246, SRR494725, SRR495771, SRR495775, SRR495776, SRR495777, SRR495778, SRR495942, SRR495943, SRR497474, SRR500265, SRR500777, SRR504340, SRR512636, SRR512663, SRR513208, SRR513209, SRR513210, SRR513211, SRR515133, SRR515134, SRR515154, SRR515155, SRR515156, SRR515157, SRR006812, SRR019731, SRR019732, SRR019733, SRR064145, SRR064146, SRR064147, SRR064148, SRR073267, SRR180578, SRR180579, SRR180582, SRR180583, SRR180584, SRR180585, SRR180587, SRR180588, SRR180589, SRR190837, SRR190838, SRR190839, SRR190841, SRR190842, SRR247923, SRR247924, SRR247925, SRR247926, SRR247927, SRR247928, SRR247929, SRR285198, SRR307133, SRR309119, SRR340044, SRR340045, SRR341283, SRR341284, SRR341429, SRR341430, SRR341910, SRR341911, SRR341912, SRR345513, SRR345529, SRR345530, SRR345531, SRR346446, SRR346447, SRR346565, SRR346590, SRR346591, SRR354196, SRR363398, SRR363399, SRR363400, SRR363844, SRR387795, SRR388179, SRR388180, SRR388181, SRR388182, SRR388183, SRR388184, SRR388323, SRR388778, SRR390921, SRR390922, SRR390923, SRR390924, SRR390925, SRR390926, SRR390927, SRR390928, SRR390929, SRR390930, SRR390931, SRR390932, SRR390933, SRR390934, SRR391286, SRR394065, SRR397585, SRR398106, SRR398287, SRR398303, SRR398577, SRR404398, SRR404399, SRR419386, SRR419388, SRR419391, SRR419517, SRR419541, SRR419543, SRR419545, SRR420189, SRR420192, SRR420196, SRR420197, SRR420198, SRR420200, SRR420811, SRR420812, SRR423934, SRR423954, SRR423956, SRR423959, SRR423961, SRR424180, SRR014345, SRR014346, SRR014347, SRR014348, SRR014349, SRR014350, SRR014433, SRR014434, SRR014554, SRR017923, SRR017924, SRR017925, SRR017926, SRR017927, SRR017928, SRR031255, SRR031801, SRR031802, SRR034445, SRR034446, SRR034447, SRR034448, SRR034449, SRR035643, SRR035644, SRR035645, SRR035646, SRR035647, SRR035648, SRR035649, SRR035650, SRR035651, SRR035652, SRR036920, SRR036921, SRR036922, SRR036923, SRR037886, SRR037887, SRR039465, SRR039466, SRR039467, SRR039565, SRR060087, SRR060088, SRR060089, SRR060090, SRR060091, SRR060092, SRR060099, SRR060100, SRR060101, SRR060102, SRR060124, SRR060125, SRR060126, SRR060127, SRR060128, SRR060129, SRR060130, SRR060131, SRR060134, SRR060135, SRR060136, SRR060143, SRR060144, SRR060145, SRR060146, SRR060147, SRR060148, SRR060767, SRR060768, SRR063952, SRR063953, SRR063986, SRR063987, SRR068954, SRR068993, SRR070551, SRR070552, SRR070553, SRR070554, SRR070667, SRR074380, SRR074381, SRR074382, SRR074383, SRR086220, SRR089758, SRR091243, SRR091244, SRR094192, SRR094397, SRR094398, SRR094399, SRR122033, SRR122107, SRR122141,

SRR122142, SRR122143, SRR122149, SRR122150, SRR122155, SRR122176, SRR122177, SRR122186, SRR122187, SRR122188, SRR122198, SRR122199, SRR122200, SRR122201, SRR122202, SRR122203, SRR122204, SRR122205, SRR122206, SRR122207, SRR122208, SRR122209, SRR122210, SRR122211, SRR124474, SRR125375, SRR125376, SRR125377, SRR125378, SRR125379, SRR180580, SRR180581, SRR180586, SRR187791, SRR002051, SRR002058, SRR002059, SRR002061, SRR002062, SRR002064, SRR014335, SRR014336, SRR014337, SRR014338, SRR014339, SRR014340, SRR014341, SRR014342, SRR014343, SRR014344, SRR1166442, SRR1166443, SRR1166444, SRR1166445, SRR1166446, SRR1166447, SRR1204807, SRR1204808, SRR1204809, SRR1204810, SRR1204811, SRR1204812, SRR1204813, SRR1204814, SRR1204815, SRR1204816, SRR1204817, SRR1204818, SRR1796376, SRR1796479, SRR1797881, SRR1797885, SRR1916152, SRR1916153, SRR1916154, SRR1916155, SRR1916156, SRR824365, SRR824366, SRR971919, SRR971920