@N2&3B#'&7!FN#*7#.?!\$(!TQ!'+6((!>&>F&3'!Z&,7&'#?.&7!633#B6*!6.7!7#'>#''6*!23\$+\$%\$*!

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7-88", '%'-5&8(9:%-,"0(
: I & . '0!ZK!/O1<=4!E8&!98636%+&3#'+#%'!6.7!9$.+& +'!$(!M.?*#'8!5&63.&3!R3$?36>!"#3&%+$3'K!!'
"$%+$36*!"#''&3+6+#$.!%$>2*&+&7!6+!5$G$*6!P.#B&3'#+G!98#%6?$!
"N386>0! "K!/O1<S4|`&&2#.?!@%8$$*'!96+8$*#%!"#'%#2*&'8#2!6'!R6367#?>!($3!H7>#.#'+36+$3'0!!
V 6*'80!EK!6.7!@2&**'0! " K!/O1<S4!9633G#.?!: N+!+8&!98N3%8D'! J 6.76+&!($3!@$%#6*!)N'+#%&^!
->2*\&>\&.+6+\#\$. !\$ (!6!@\&3B\#\%\&,5\&63.\#.?!R3\$?36>!\#.!6!96+8\$^*\#\%!@\%8\$\$^*!@\&++\#.?\&!!"\$\%+\$36^*!
"#''&3+6+#$.!%$>2*&+&7!6+!5$G$*6!P.#B&3'#+G!98#%6?$!
] 6 I [0! J K0! J #%8&*FN3?80!MK!6.7! ] $$B&30!ZK!/O1<$4!96+8$*#%!@%8$$*!E&6%8&3!6'!H%+#$.!
Z&'&63%8&3^!H!R3$U&%+! " & '#? . &7!+$!M>2$ I &3!6 . 7!E36 . '($3>!96+8$*#%!@%8$$*!E&6%8&3'!# . +$!
-.'+3N%+#$.6*!R3$F*&>!@$*B&3'K!!"$%+$36*!"#''&3+6+#$.!%$>2*&+&7!6+!5$G$*6!P.#B&3'#+G!98#%6?$!
J & .7& .0! J KO! J $3+& .0!@KO!6 .7!@N**#B6 .0! "K!/O1<Q4!@8#(+# .?!R3$(&''#$ .6*!9N*+N3&!# .!96+8$*#%!
@%8$$*'^!H!96'&!@+N7GK!"$%+$36*!"#"'&3+6+#$.!%$>2*&+&7!6+!5$G$*6!P.#B&3'#+G!98#%6?$!
EN% [&30!@K!/O1<04!98&% [,#.,98&% [,$N+!6.7!R63&.+,9$>2$.&.+!C&86B#$3!-.+&3B&.+#$.K!!" $%+$36*!
"#''&3+6+#$.!%$>2*&+&7!6+!5$G$*6!P.#B&3'#+G!98#%6?$!
CN7#36863U$0! J K!/O1<\4!H!R8&.$>&.$*$?#%6*!@+N7G!$(!E36.'($3>6+#B&!5&63.#.?!#.!R63+#%#26.+'!#.!
V 6*[&30!EK!/O1<04!H++#+N7&'!6.7!-.%*N'#$.^!H.!& 6>#.6+#$.!$(!+&6%8&3'D!6++#+N7&'!+$ I 637!
#.%*N7#.?!'+N7&.+'!I#+8!7#'6F#*#+#&'K!!"$%+$36*!"#''&3+6+#$.!%$>2*&+&7!6+!5$G$*6!P.#B&3'#+G!
98#%6?$\!
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0100!5$G$*6!P.#B&3'#+G!98#%6?$
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bR3$U&%+!E&6>!5&67c!/dS000111!(N.7&7!+83$N?8!+8&! " &263+> & .+!$(!M7N%6+#$.4K!!E8#'!23$U&%+!#'!
263+!$(!6!*63?&3!d<\KO!>#**#$.!?36.+!+$!'N22$3+!+8&!#.'+3N%+#$.6*!&((&%+#B&.&''!$(!23#.\%#26*'!+83\$N?8!
+8&!@HJD'!/'%8$$*!67>#.#'+36+#B&!>6.6?&34!23$%&''K!!E8#'!?36.+!#'!+63?&+&7!+$!<0!96+8$*#%!
'%8$$*'K!
b96+8$*#%!R3#.%#26*!R3&2636+#$.!R3$?36>c!/dQ10111!(N.7&7!+83$N?8!+8&!]&*&.!C36%8!e$N.76+#$.4!
bH**!H3&!V &*%$>&. " &B&*$2#.?!-.%*N'#B&!R36%+#%&'!#.!96+8$*#%!@%8$$*'cK!!R63+.&3#.?! I #+8!
H'2#3&,98#%6?$!6.7!+8&!C#?!@8$N*7&3'!eN.70!'&\\N3&7!d<\\XQ!>#**#$.!?36.+!+$!\\3&6+&!6.7!
#>2*&>&.+!6.!#.%*N'#B&!&7N%6+#$.!>$7&*!I#+8#.!96+8$*#%!'%8$$*'K!
-5!R63+.&3'8#2'!H7B6.%#.?!Z#?$3$N'!E36#.#.?,@%8$$*!5&67&3'8#2!R3$?36>!/@5R4!L36.+!!
/01<\,01<\W4K!!9$$37#.6+&!263$%8#6*!'%8$$*!263+.&3'8#2!$(!+8&!"#$%&'&!$(!Z$%[($370!R&$3#60!6.7!
@23#.?(#&*7!#.!'+6+& I #7&!7&B&*$2>&.+!$(!'\%8\$*!*\&67\&3'\8#2\K!/dQ110111!\P\K@\K!''\&263+>\&.+!\$(!
M7N%6+#$.4!!
5&67&3'8#2!+$!-.+&?36+&!+8&!5&63.#.?!9$.+#.NN>!L36.+K!/E83$N?8!+8&!9&.+&3!($3!+8&!@+N7G!$(!
M7N%6+#$.6*!R$*#%G,-**#.$#'!@+6+&!P.#B&3'#+G4!R63+#%#26+#$.!$(!\$.+#.N$N'!#>23$B&>&.+!23$\&''!
($3!+8&!3&,7&'#?.!$(!+8&!96+8$*#%!R3#.%#26*!R3&2636+#$.!R3$?36>!6+!5$G$*6!P.#B&3'#+G!98#%6?$4!
R3$U&%+!(N.7&7!FG!+8&!Z$F&3+!ZK! J %9$3>#%[!e$N.76+#$.K!!!
b: 2&.#.?!+8&!''$$3'!+$!H**c!/011=!+$!01<W4!,H!23$?36>!N'#.?!3&'2$.'&!+$!#.+&3B&.+#$.!+$!'N22$3+!
<1!N3F6.!96+8$*#%!&*&>&.+63G!'%8$$*'K!!!R3$U&%+!(N.7&7!FG!+8&!C#?!@8$N*7&3'!eN.7!/d010111!2&3!
G&634!
>&$-'"0(?"@&5'"(A,"8"&'%'-5&8(
b J $B#.?!(3$>!-.%*N'#$.!+$!C&*$.?#.?^!H%%$>26.G#.?!@+N7&.+'!I#+8!"#'6F#*#+#&'!#.!96+8$*#%!
@%8$$*'c!/H23#*!01004K!H773&''!7&*#B&3&7!6+!+8&! a 9MH! a 6+#$.6*!9$.B&.+#$.K! a & I!: 3*&6.'0!5HK!
bE8&!R$ I &3!$(!C&*$.?#.?^! J $B#.?!R6'+!-.%*N'#$.c!/H23#*!01004!H773&''!7&*#B&3&7!6+!+8&!
bC&G$.7!:2&.#.?!+8&!"$$3'^!M2*$3#.?!C&*$.?#.?!I#+8#.!-.%*N'#B&!R3$?36>'!#.!96+8$*#%!
@%8$$*'c!%$.(&3&.%&!6+!+8&!P.#B&3'#+G!$(!@6.!"#&?$\!
b96..$.F6**'0!9:;-"!6.7!+8&!a&I!Z&6*#+Gc!/J63%8!01004!H773&''!7&*#B&3&7!6+!+8&!56'6**#6.!
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C$G*&0! J K!/O1<14!H!C36B&! a & I ! V $3*7^!Z+-!#. !96+8$*#%!@%8$$* 'K!H.68&#>!9H^! a 9MH!@2&##6*!
a &&7'!9$.(&3&.%&K!
C$G*&0! J K!/O11=4! J G+8'!6.7!Z&6*#+#&'!$(!Z+-!6.7!96+8$*#%!@%8$$*'K!H.68&#>0!9H^!a6+#$.6*!
96+8$*#%!M7N%6+#$.6*!H''$%#6+#$.!a6+#$.6*!9$.(&3&.%&X!
C$G*&0! J K!6.7!: A630!5K!/O11=4!R3&B&.+#.?!9N33#%N*N>!96'N6*+#&'^!P.#B&3'6*!"&'#?.!#.!96+8$*#%!
@%8$$*'K!H.68&#>0!9H^!a6+#$.6*!96+8$*#%!M7N%6+#$.6*!H''$%#6+#$.!a6+#$.6*!9$.(&3&.%&K!
C$G*&0! J K!/O11=4! J G+8'!6.7!Z&6*#.#&'!$(!Z+-!6.7!96+8$*#%!@%8$$*'K!9863*&'+$.0!@9^a 9MH!
@2&%#6*! a &&7'!9$.(&3&.%&\!
C$G*&0! J K!6.7!L36.?&30!EK!/O11=4!93&6+#.?!E&6%8&3!H''#'+6.%&!E&6> 'K!!-.7#6.62$*#'0!-a^!
a 6+#$.6*!96+8$*#%!M7N%6+#$.6*!H''$%#6+#$.!a 6+#$.6*!9$.(&3&.%&X!
C$G*&0! J K!6.7!: A630!5K!/O11=4! " & '#?.#.?!($3!P.#B&3'6*!@N%%&' 'K!-.7#6.62$*#'0!-a^!a6#$.6*!
96+8$*#%!M7N%6+#$.6*!H''$%#6+#$.!a6+#$.6*!9$.(&3&.%&K!
C$G*&0! J K!/<===4!93&6+#.?!93#+#%6*!9$.'N>&3'!$(!-.($3>6+#$.K!@+K!9863*&'0!-5^!-@P!9$..&%+#$.'!
9$.(&3&.%&K!
@$N+8!e*$3#76!9$.(&3&.%&!$.!E8#.[#.?, J #6>#0!e*K!
C$G*&0! J K!/<==W4! ] $*#'+#%!H223$6%8!+$!+8&!E&6%8#.?!$(!E8#.[#.?K!98#%6?$0!-5^!-**#.$#'!
H''$%#6+#$.!$(!L#(+&7!98#*73&.K!
C$G*&0! J K!/<==Q4! 93&6+#.?!6! 9N*+N3&!$(!E8#. [#.?K!98#%6?$0!-5^!E8&!-**#.$#'!H''$%#6+#$.!$(!
L#(+&7K!)
!
C$G*&0! J K!/<==04!5&67&3'8#2!#.!M %&2+#$.6*!R$2N*6+#$.'K!H3*#.?+$.!1+'K'!E8&!-**#.$#'!9$N.%#*!$(!
M_%&2+#$.6*!98#*73&.K!
C$G*&0! J K!/<==Q4!L&.7&3!C#6'^!E8&!Z$67F*$%[!+$!@N%%&''K!@23#.?(#&*70!-5K^!-**#.$#'!@%8$$*!
R'G%8$*$?#'+!H...N6*!9$.(&3&.%&K!
C$G*&0! J K!6.7!56R$.+&0! J !/<==T4!R3&'&.+#.?!@$%#6*!@[#**'!L3$N2'!#.!a6+N36*!9$.+&_+'K!
Z$%[($370!-5^!!-**#.$#'!H''$%#6+#$.!$(!@%8$$*!R'G%8$*$?#'+'K!
C$G*&0! J K0! ` & . . &G0!RK!56R$ . +&0! J K!6 . 7!5#B&3?$$70!5K!/<==\4!H!9$**6F$36K
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! C$G*&0! J K!/<==04!9$?.##B&!6.7!H((&%+#B&!"#((&3&.%&'!#.!)626.&'&!6.7!H>&3#%6.! J 6+8&>6+#%6**G!E6*&.+&7!C$G'K!a6'8B#**&0!Ea^!a6+#$.6*!H''$%#6+#$.!$(!@%8$$*!R'G%8$*$?#'+'! H..N6*!9$.B&.+#$.K!!
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C$G*&0! J Km! "$.68N&0! "$.$?8N&0!L0!e6F&30!)$.&'0!e0!Z6G,E#>$.&G0!)K0!E&'%8&0!CK0!6.7!P8*0!EK!
i9:;-"!V#+.&''!+$!]$2&^!96+8$*#%!@%8$$*'!Z&'2$.7!+$!9:;-",<=i!/01014\!9:;-",<=!6.7!
96+8$*#%!@%8$$*'K!SK!8++2'^YY7#?#+6*%$>>$.'K*>NK&7NY%&n%$B#7YS!
C$G*&0! J K!6.7! "$'&.0!HK!/01<X4K!!R3&263#.?!@&>#.63#6.'!+$!V$3[!I#+8!96+8$*#%!@%8$$*'^!H!
9$.+&.+!H.6*G'#'!$(!+8&!9N33#%N*N>K!)$N3.6*!$(!96+8$*#%!M7N%6+#$.K!
8++2^YY7_K7$#K$3?Y<1K<Q\SQYU$%&K01101Q01<X!
R8#*#22&0! " KO! ] &3.6.7&A, J &*#'0!9K0!e&..#.?0!RK0!@&63'0!`0!V&'*&G0!MK0!56I3&.%&0!MK0!C$G*&0!JK!
/01<X4!H!9$.+&.+!H.6*G'#'!$(!96+8$*#%!@%8$$*!V3#++&.!"#'%#2*#.&!R$*#%#&'K!)$N3.6*!$(!96+8$*#%!
M7N\%6+\#\$.K!!":-^{1}<0\SQYU\$\%\&KO<1<1001<X!
C$G*&0! J K!)K!/O1<X4K!@N22$3+#.?!'+N7&.+'! I #+8!7#'6F#*#+#&'!#.!96+8$*#%!&*&>&.+63G!6.7!'&%$.763G!
'%8$$*'^!L!01(2-%)3!2)*2&.!&9831()-'!$&.,$&3()/&5!M$91(&J!T\/\40!<T,<Q%!!
C$G*&0! J K!6.7! ] &3.6.7&A0! 9K!/O1<$4!-.B&'+#?6+#.?!+8&!H++#+N7&'!$(!96+8$*#\)!@\8$$*!R3#.\\#26*'!
+$ I 637'!+8&!-.%*N'#$.!$(!@+N7&.+'!I#+8!"#'6F#*#+#&'K!)$N3.6*!$(!96+8$*#%!
M7N%6+#$.K!!8++2^YY7 K7$#K$3?Y<1K<Q\SQYU$%&KO11<1=01<S!
C$G*&0! J K!/O1<S4!-.+3$7N%+#$.!+$!+8&!e$%N'!@&%+#$.^!R3&263#.?!5&67&3'!#.!5#?8+!$(!+8&!@+6.7637'!
)$N3.6*!$(!96+8$*#%!M7N%6+#$.K!8++2^YY7 K7$#K$3?Y<1K<Q\$QYU$%&K<=1\<T01<$!
C$G*&0! J K0! ] 6**&30!HK0!6.7! ] N.+0!MK!/O1<S4!E8&!5&67&3'8#2!986**&.?&^!R3&263#.?!6.7! " &B&*$2#.?!
96+8$*#%!@%8$$*!R3#.%#26*'\!)$N3.6*!$(!96+8$*#%!M7N%6+#$.\!
http5e596xp6t.516x1 \( \tag{5}16c555e\)16e555e53e\)312\)jcx:.516x2\( \tag{5}16x2\).516x9.516xi.516xi.516xp1\( \tag{5}16x0\).
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@&3B&7!6'!R3$U&%+! J 6.6?&3!($3!5$G$*6!R3&''!$.^!

!

@N++$.0!5K!/O1014!E&6%8#.?!@+N7&.+'!I#+8!HN+#'>!#.!6!96+8$*#%!@&++#.?K!98#%6?$^!5$G$*6!
R3&''K!
!

C63$.&0!)K!6.7!`6+360!9K!/O1<=4!e6#+8,C6'&7!@+36+&?#&'!+$!Z&6%8!6.7!E&6%8!5&63.&3'!I#+8!
"#'6F#*#+#&'K!98#%6?$^!5$G$*6!R3&''K!
!

@&3B&7!6'!2&76?$?#%6*!%$.'N*+6.+!$.!
!
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C\$G*&0! J K!/@&2+&>F&3!O1<O4!R3\$B#7#.?!(\$3!%86**&.?#.?!F&86B#\$3'!R63+!--!K! a 9MH! a \$+&'^! a 6+#\$.6*! 96+8\$*#%!M7N%6+#\$.6*!H''\$\#6+#\$.K!!!

C\$G*&0! J K!/ J 6G!O1<O4!R3\$B#7#.?!(\$3!%86**&.?#.?!F&86B#\$3'!R63+!-K!K! a 9MH! a \$+&'^! a 6+#\$.6*! 96+8\$*#%!M7N%6+#\$.6*!H''\$\#6+#\$.K!!!

C\$G*&0! J K!/ J 63%8!01<04!@&3B#.?!'+3N??*#.?!*&63.&3'! I #+8!H"] "K!K! a 9MH! a \$+&'^! a 6+#\$.6*! 96+8\$*#%!M7N%6+#\$.6*!H''\$%#6+#\$.K!!!

C\$G*&! J K!/@&2+&>F&3!O1<<4!R3\$B#7#.?!(\$3!'+3N??*#.?!*&63.&3'K! a 9MH! a \$+&'^! a 6+#\$.6*!96+8\$*#%! M7N%6+#\$.6*!H''\$%#6+#\$.K!!!

C\$G*&0! J K!/ J 6G!O1<14!**BT**50005074(BT5.2418583.92c050798.510752005074(BT2('6.2(3B#)0.(\$(7N%)07(.0.2

a \$+&'^! a 6+#\$. 6*! 9 6+8\$*#%!M7N%6+#\$. 6*!H''\$%#6+#\$. K!!!

: A630!5 K!6.7!C\$G*&0! J!/ J 6G!O11 W4!-''N&,]\$>& I \$3 [K!a 9 MH!a \$+&'^!a 6+#\$.6*!9 6+8\$*#%! M7N%6+#\$.6*!H''\$%#6+#\$.K!!!!

: A630! 5 K!6.7!C\$G*&0! J!/ J 63%8!O11W4!R3\$B#7#.?!e&&7F6%[!I#+8!ZNF3#%'!K!a9MH!a\$+&'^!a6+#\$.6*!96+8\$*#%!M7N%6+#\$.6*!H''\$%#6+#\$.K!!!

: A630!5 \(\) 1. \(\) 1. \(\) 6. \(\) N63G!011 \(\) 4! \(\) 2. \(\) 4. \(\) 1. \(\) 6. \(\) 3. \(\) 1. \(\) 6. \(\) 3. \(\) 1. \(\) 4. \(\) 1. \(\) 4. \(\) 1. \(\) 4. \(\) 1. \(\) 4. \(\) 1. \(\) 4. \(\) 1. \(\) 4. \(\) 1. \(\) 1. \(\) 4. \(\) 1. \(\)

: A630!5 K!6.7!C\$G*&0! J !/a\$B&>F&3!O11X4!-7&.+#(#%6+#\$.!\$(!@#>#*63#+#&'!6.7! "#((&3&.%&'!+83\$N?8! 93&6+#.?! J &+628\$3'!K!a9MH!a\$+&'^!a6+#\$.6*!96+8\$*#%!M7N%6+#\$.6*!H''\$\#6+#\$.K!!!

: A630!5 K!6.7!C\$G*&0! J !/@&2+&>F&30!O11X4!-7&. +#(G#.?!@#>#*63#+#&'!6.7! " #((&3&.%&'!+83\$N?8! 9\$>263&!6.7!9\$.+36'+!K! a 9MH! a \$+&'^! a 6+#\$.6*!96+8\$*#%!M7N%6+#\$.6*!H''\$%#6+#\$.K!!!

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0.&1()'*!"..&,),()F%&!432--%,!432--%!C#'8\$2! J % a 6>636!]#?8!@%8\$\$*0!`6.[6[&&0!-5!:%+\$F&3!01<\!

(B2)'>)'*!+-8()'&,C!B2&!;M:L>)9,!7.-*.1#

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| J &> F&30!C$637!$(! "#3&%+$3'0!5$G$*6!R3&' '!/01<X,010\4!
| C$637!986#3,!L$B&3.#.?!C$6370!a6+#$.6*!96+8$*#%!R63+.&3'8#2!$.!"#'6F#*#+G!/01<=,23&'&.+4!
| J &> F&30!a6+#$.6*!96+8$*#%!R63+.&3'8#2!$.!"#'6F#*#+G!/01<Q,01<=4!
| J &> F&30!L$B&3.#.?!C$637!($3!01(2-%)3!H9831()-'C!L!1-8.'1%!-<!"'X8).A!1'9!7.13()3&!YDSEZ0!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSDS!1'9!DSE20!DSEX[!
| J &> F&30!H7N*+!e6#+8!e$3>6+#$.!9$>>#++&&0!e+#!J #%86&*!98N3%80!V8&6+$.0!-5!/01<<,01<04!
| J &> F&30!M7N%6+#$.!9$>>#''#$.#!]$*G!E3#.##G!]#?8!@%8$$*0!98#%6?$0!-5!/01<1,01<\4!
| J &> F&30!H%67&>#%!H7B#'$3G!C$637#!98#%6?$!)&'N#+!H%67&>G0!98#%6?$0!-5#/011=,01<\4!
| J &> F&30!R3#.%#26*!@&63%8!9$>>#++&&#!]$*G!e6>#*G!H%67&>G0!C&.'&.B#**&0!-5#/011=4!
| 9$.'N*+6.+0!Z&'2$.'&!+$!-.+&3B&.+#$.!]6.7F$$[0!"#$%&'&!$(!)$*#&+!/011W4!
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